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Edited by Xu Wen and John R. Taylor

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INTRODUCTION

Cognitive Linguistics: Retrospect and Prospect

Xu Wen and John R. Taylor

1. Introduction

Cognitive Linguistics is "the scientific study of the nature of thought and its expression in language" (Lakoff 2004: 123). It began to emerge in the 1970s and has been increasingly active since the 1980s. In 1987, the two "Bibles" of Cognitive Linguistics were published: George Lakoff's *Women, Fire, and Dangerous Things*, and the first volume of Ronald W. Langacker's *Foundations of Cognitive Grammar*. Then, in the spring of 1989, the first international cognitive linguistics conference was held in Duisburg, Germany, and the establishment of the International Cognitive Linguistics Association (ICLA), together with the journal *Cognitive Linguistics* in 1990, "marked the birth of cognitive linguistics as a broadly grounded, self-conscious intellectual movement" (Langacker 1990: ix).

Cognitive linguistics is a new paradigm of linguistics, which can chiefly be classified into "macro-cognitive linguistics" (with a lower-case "c") and "micro-cognitive linguistics" (with capitalized "C"). Any linguistic theory, as long as it takes human language as a mental phenomenon, belongs to macro-cognitive linguistics. For example, Chomsky's *Generative Grammar* and Jackendoff's *Conceptual Semantics* fall into this category. Cognitive Linguistics, the focus of this handbook, differs from the Chomskyan tradition in dealing with the nature of grammar, the core place of meaning, and the relation between language and human cognition. The Chomskyan tradition has a view of language that makes strong commitments about the primacy of syntax, disregarding the role of semantics and pragmatics in linguistic theoretical construction; whereas Cognitive Linguistic theories are semantics- and usage- (or pragmatics)-based, and take meaning as the core of linguistic studies. The other important aspect of the Chomskyan tradition is the assumption that linguistic knowledge is independent of other cognitive faculties, which leads to the claim of the autonomy of syntax and the modularity of language. But Cognitive Linguistics does not declare that language is autonomous. Instead, it conceives of linguistic cognition as an inseparable part of general human cognition.

Cognitive Linguistics is also somewhat different from functional linguistics, although they have a fundamental concern with respect to referring to extra-linguistic potentials to explain linguistic behavior. Cognitive Linguistics focuses on the instruments that language provides for understanding human embodiment in the physical world, whereas functional linguistics scrutinizes linguistic structure as it reflects its use in communication. In addition, Cognitive Linguistics emphasizes the

relationships among conceptual entities represented in linguistic structures, whereas functional linguistics often makes use of natural discourse data.

Cognitive Linguistics has two main purposes: (1) to study how cognitive mechanisms like memory, categorization, metaphor, metonymy, attention, and imagery are used during language behavior; and (2) to develop psychologically viable models of language that cover the broadest possible range of linguistic phenomena, including idioms and figurative language.

Cognitive Linguistics is not a single linguistic theory. Instead, it is an enterprise, an approach, a school, a movement, a perspective, or a paradigm that has adopted a large number of implications or achievements from cognitive science and cognitive neuroscience, more particularly, from philosophy, cognitive psychology, gestalt psychology, anthropology, brain science, and cultural studies, on top of adding many new perspectives to the study of language and mind, thereby improving the scientificity of linguistic studies.

Cognitive Linguistics is defined in terms of two primary commitments: the Generalization Commitment and the Cognitive Commitment (Lakoff 1990). The former concerns the general principles which govern all aspects of human language, whereas the latter strives for an account of human language which should be in accordance with what is known about the mind and the brain from other disciplines. Lakoff (1990) said: "If we are fortunate, these commitments will mesh: the general principles we seek will be cognitively real. If not, the cognitive commitment takes priority: we are concerned with cognitively real generalizations." These two commitments have offered specific guiding principles for the study of such core areas of language as phonology, morphosyntax, semantics, and pragmatics, and the interdisciplinary study between Cognitive Linguistics and some other disciplines.

Cognitive Linguistics has the following major guiding principles or fundamental hypotheses which guide the cognitive approach to the study of language and mind:

- Language is not an autonomous cognitive faculty, but a main part of human cognition.
- Human languages are an open-ended inventory of symbolic units in which forms are conventionally paired with meanings (i.e., constructions).
- Meaning is what language is all about.
- Meaning construction is conceptualization.
- Semantic structure is conceptual structure.
- Conceptual structure is embodied.
- Meaning representation is encyclopedic.
- Grammar is meaningful.
- Knowledge of language basically emerges from language use.

These hypotheses or guiding principles have not only defined the scope and contents of Cognitive Linguistics, but have also led cognitive linguists to explore the invisible relations between human language and human cognition.

2. The Main Contents of Cognitive Linguistics Research

Studies in the Cognitive Linguistics paradigm have different perspectives or orientations governed by the shared common set of guiding principles and hypotheses presented above. These include the following aspects.

2.1 Phenomenology-Based Research

Research from this perspective is primarily based on phenomenology, which is proposed by Edmund Husserl (1859–1938). One important slogan of phenomenology is "Go back to the thing

itself" (auf die Sachen selbst zurueckgehen). In other words, we should get rid of all prejudices and confront the thing itself rather than what's behind it. The American philosopher Thomas Nagel famously mused on the question of "What is it like to be a bat?" (1974). This means that embodiment is important. As to language, this implies that our bodily experiences are important for us to know what language is.

Cognitive Linguistic research based on phenomenology mainly consists of prototype theory, prototype semantics, lexical network theory, conceptual metaphor theory, conceptual metonymy theory, embodied realism, and cognitive pragmatics. Great achievements have been made in all these areas. These achievements are applied not only to linguistic research, but also to various fields such as culture, society, politics, art, religion, and so forth.

2.2 Gestalt-Psychology-Based Cognitive Linguistic Research

Gestalt psychology, which is also under the influence of Edmund Husserl's phenomenology, advocates that psychology should focus on phenomenological experience or, in other words, on non-mental and non-physical neutral experience. In the observation of phenomenological experience, phenomena should be kept as they are instead of being analyzed as perceptual elements, and phenomenological experience should be conceived as a whole or gestalt. Cognitive Linguistic research based on Gestalt psychology mainly includes Langacker's cognitive grammar, construction grammar, and Talmy's cognitive semantics. Langacker's works (1987/1991) are classic and worthy of careful and in-depth study. His ideas are presented inclusively in Taylor's (2002) introductory book. Construction grammar was developed from the early research by Fillmore, Kay, and O'Connor (1988). There are also other varieties of constructional approach to grammar such as Lakoff and Goldberg's Cognitive Construction Grammar (CCxG), Croft's Radical Construction Grammar (RCG), Bergen's Embodied Construction Grammar (ECG), Steel's Fluid Construction Grammar (FCG), and Sag and Michaelis's Sign-Based Construction Grammar. In general, Langacker's cognitive grammar can also be called construction grammar since his "symbolic units" are essentially equivalent to "constructions" in construction grammar. The theories of construction grammar have been extensively applied to language acquisition, computational linguistics, translation studies, among others.

2.3 Cognitive Discourse and Poetics Research

Early research on Cognitive Linguistics focused on the semantics of the lexicon and syntax, less attention being paid to pragmatics and discourse. As we know, lexical-syntactic structures in language appear to be systematically related to human cognitive structures and processes. Therefore, to explore how language is organized in discourse is beneficial to understanding human cognitive structure and processes. At present, the cognitive study of discourse is an important trend (Tenbrink 2020). Research in this field contains Fauconnier's mental space theory and conceptual blending theory, cognitive stylistics, cognitive poetics, cognitive narratology, textual world, and the representation of discourse.

Since Lakoff and Turner (1989) launched their pioneering work on cognitive poetics, it has made great progress over the past three decades. A large number of monographs and volumes have been published, such as Stockwell (2002), Gavins and Steen (2003), Brône and Vandaele (2009). Poetic metaphor, an important concept of cognitive poetics, is a key concept which cognitive poetics has given much attention to. One of the most amazing findings is the fact that most poetic language is based on daily conceptual metaphors. It has been proven that in literary works the frequency of use of creative literary metaphors is much lower than that of conceptual metaphors based on experience. Therefore, in the research on cognitive poetics, conceptual metaphor theory plays a major role.

2.4 Cognitive Sociolinguistic Research

Since the "social turn" in linguistics, there has been a common consensus that language has a close connection with the social world. Hence, the study of human language has to consider the social dimension of language. The "social turn" of Cognitive Linguistics has resulted in two branches of Cognitive Linguistics: cognitive sociolinguistics, and social cognitive linguistics.

Cognitive sociolinguistics, as a burgeoning field of linguistic research, is broadly known as a convergence of Cognitive Linguistics and sociolinguistics. One of the most important tenets of Cognitive Linguistics is that "meaning is what language is all about" (Langacker 1987: 12). As we know, meaning does not exist in isolation, but is realized in certain socio-pragmatic environments. As Geeraerts et al. (2010) have pointed out: "It [meaning] is created in and transmitted through the interaction of people, and that is why the definition and the basic architecture of language are recognized by Cognitive Linguistics as involving not just cognition, but socially and culturally situated cognition."

Research on cognitive sociolinguistics mainly involves the following topics: a usage-based cognitive approach to language, cognitive lexical variation research, cognitive ideology research, cultural cognitive models, language cultural model theory, language policy, social political system research, etc.

Social cognitive linguistics or sociocognitive linguistics (Croft 2009; Wen 2019), on the other hand, is a systemic investigation into human language on the basis of social cognition theory. It is primarily concerned with how the representation of language knowledge, language acquisition, language use (including language production and processing), and language change or evolution are influenced by (embodied) social cognition. It also offers a new perspective for the development of Cognitive Linguistics.

2.5 Cognitive Psycholinguistic Research

Cognitive psycholinguistics is a novel field of research which integrates Cognitive Linguistics with psycholinguistics and language acquisition. Within the field of cognitive psycholinguistics, much attention has been paid to the following topics: language processing, image schemas, the understanding of figurative language, language acquisition, a usage-based theory of acquisition, growth of lexical network, etc. In the view of Cognitive Linguistics, most of our knowledge is imagistic, not propositional. Image schemas are the foundation of thinking and reasoning. But what is an image schema? How does it come into being? What is the role of image schemas in the construction of thoughts? These questions are important topics in the field of Cognitive Linguistics.

The understanding of figurative language is the main content of cognitive psycholinguistics which relates to the understanding of figures of speech like metaphor, metonymy, irony, and so on (Gibbs 1994; Turner 1996). Usage-based and construction-oriented language acquisition research is an important new development in the study of first and second language acquisition. Many achievements in this field have been accomplished by Tomasello (2003), Achard and Niemeier (2004), Goldberg (2006), and Robinson and Ellis (2008).

2.6 Cognitive Historical Linguistics and the Contrastive Study of Languages

Cognitive historical linguistics is a combination of Cognitive Linguistics and historical linguistics, the aim of which is systematically using the theories of Cognitive Linguistics to deal with historical/diachronic linguistic problems. Cognitive historical linguistics mainly includes the following fields: diachronic semantics, diachronic construction grammar, (de)grammaticalization, subjectification, etc. Geeraerts's (1997) research into diachronic prototype semantics was innovative and he invoked prototype theory as the scientific paradigm to research some key

issues in traditional lexical semantics such as typical characteristics of semantic evolution and the motivation and mechanism of semantic evolution. Research on grammaticalization and the combination of grammaticalization and subjectification, as a very important content of cognitive diachronic linguistics, has reaped a rich harvest. Traugott and Trousdale's (2013) and Hilpert's (2013) study of constructionalization and constructional change has provided valuable insight into the nature of constructions and for the investigation of diachronic construction grammar (Traugott 2014; Barðdal, Smirnova, Sommerer, & Gildea 2015; Hoffmann 2019; Sommerer & Smirnova 2020).

The cognitive approach to contrastive language study applies the theories of Cognitive Linguistics to study languages cross-linguistically, including cross-cultural semantics, cultural linguistics, and cognitive linguistic typology. Research into cross-cultural semantics and cognitive linguistic typology within the framework of Cognitive Linguistics is a recent development, worthy of exploring in depth.

2.7 Applied Cognitive Linguistic Research

Applied Cognitive Linguistics, as its name suggests, is a field of research which aims to address practical linguistic problems with the apparatus of Cognitive Linguistics. Applied Cognitive Linguistics currently focuses on the fields of ideology, language acquisition, language pedagogy, translation, and lexicology. In a general sense, the study of Applied Cognitive Linguistics has two sides. On the one hand, we make use of the theories and methodologies of Cognitive Linguistics to solve linguistic and social problems; on the other hand, the social and linguistic phenomena are shown as the testing ground for the theories of Cognitive Linguistics. Therefore, Applied Cognitive Linguistics appears to be a promising land of research. Many convincing achievements have been made in the work of Tabakowska (1993), Pütz et al. (2001), Holme (2004), Tyler et al. (2005), Caballero (2005), De Knop and De Rycker (2008), Littlemore (2009), Tyler (2012), Bielak and Pawlak (2013), Rojo and Ibarretxe-Antuñano (2013), among others.

3. The Chapters of This Handbook

The chapters contributed by cognitive linguists from all over the world provide a multifaceted view on the panorama of Cognitive Linguistics, focusing on three major issues: (1) the fundamental theories, assumptions, and methodology of Cognitive Linguistics; (2) the core topics and concepts of Cognitive Linguistics; and (3) the interface between Cognitive Linguistics and other disciplines. The handbook, consisting of four parts, is structured according to the principle "from theoretical hypotheses to practical usage, then to interdisciplinary research". It places special emphasis on the interdisciplinary and multidisciplinary study of language and mind. Within each part, the chapters are roughly organized in terms of their essentiality and importance. The first part gives a bird's-eye view of the basic theories and hypotheses of Cognitive Linguistics. In Part II, some central topics of Cognitive Linguistics are addressed. The chapters in Part III concentrate on the interface between Cognitive Linguistics and other disciplines. The last part is about the new trend of Cognitive Linguistics.

Part I: Basic Theories and Hypotheses

The seven chapters in this part provide an introduction to and deep reflections on basic theories and hypotheses.

Chapter 1 (Dirk Geeraerts) comprises the diverse set of descriptive models developed within cognitive linguistics for the analysis of linguistic meaning, including notions like prototypicality, radial networks, conceptual metaphor, conceptual metonymy, frame semantics, and construal mechanisms

in grammar. The chapter describes the complementarity between these approaches, and identifies their commonalities in terms of a conception of meaning that is perspectival, dynamic, and experiential. Open issues include the proper balance between a psychological and sociohistorical conception of cognition, the methodology of cognitive semantics, and the theoretical integration of the various descriptive models.

Chapter 2 (Cristiano Broccias) illustrates the key features and development in cognitive grammar. It starts by focusing on the so-called grammar-lexicon continuum. Then it discusses key cognitive abilities and cognitive models. Among the former are association, categorization, automatization, construal, the reference-point ability, and fictivity. The latter include the stage model, the billiard-ball model, and the control cycle. The rest of the chapter is concerned with introducing the conceptual characterization of grammatical classes and roles and illustrating the claim that traditional hierarchical constituency is neither necessary nor desirable within a dynamic account of language use.

Chapter 3 (Hans C. Boas) provides an overview of the theory of Construction Grammar and its sister theory Frame Semantics, both developed at the University of California, Berkeley, during the 1980s and 1990s. The first part provides a historical overview of Construction Grammar and Frame Semantics, highlighting their connections with the research of Charles Fillmore on Case Grammar in the late 1960s. This overview is followed by a discussion of the Berkeley FrameNet project (founded in 1997), which has applied the theoretical principles of Frame Semantics to the creation of a lexicographic database of English that also includes detailed information about valence patterns of English verbs, nouns, adjectives, and prepositions. The main part of this chapter discusses the main principles of Construction Grammar and shows how constructionist research addresses topics such as the lexicon-syntax continuum, argument structure constructions and other types of constructions, constructional families and networks, corpus data, productivity, motivation, frequency, the role of formalization, and issues relevant for contrastive linguistics. The chapter continues with a review of how constructionist insights have been applied to grammaticography, yielding a more specific approach that has come to be known as constructicography. The last part of the chapter addresses open issues such as the typology of constructions, interactions of constructions, and systematic discovery methods for finding and analyzing constructions.

Chapter 4 (Thomas Hoffmann) is about multimodal construction grammar. Human communication is inherently multimodal. Whenever people communicate face-to-face, they do not just rely on language, but also use gestures and stance as well as facial expressions to communicate their wishes, intentions, as well as information. The chapter illustrates how the most successful cognitive theory of language, Construction Grammar, can explain the creative online processes that underlie our ability to communicate multimodally.

Chapter 5 (Cliff Goddard) overviews the theory, practice, and applications of one of the more productive and versatile approaches in Cognitive Linguistics, the Natural Semantic Metalanguage approach originated by Anna Wierzbicka. The NSM approach describes meanings using simple cross-translatable words. The chapter introduces the basic tenets and concepts behind the approach, such as semantic primes, semantic molecules, semantic templates and explications. It sketches NSM's intellectual history and theory development over 40 years, identifies major research themes and critical issues, and presents examples of recent work in cultural pragmatics, lexical semantics, and lexicogrammar.

Chapter 6 (Richard Hudson) focuses on Word Grammar. This theory agrees with other theories in the family of cognitive linguistics that human beings use the same mental apparatus for language as for other kinds of knowledge; but some of its assumptions about this knowledge are distinctive, and lead to distinctive linguistic analyses. Language is a single integrated network of atomic nodes, and so is the structure of a sentence: a rich dependency structure rather than a tree. The underlying logic is default inheritance applied to taxonomies which include relational concepts as well as entities, so the language network contains an open-ended taxonomy of relations; and

these taxonomies extend upwards into general knowledge as well as downwards into the tokens and 'sub-tokens' of performance. These sub-tokens interact with dependency structure to create a new token of the head word for each dependent, a new compromise between dependency structure and phrase structure. The cognitive assumptions also lead to insightful analyses of logical semantics, lexical semantics, learning, processing, and sociolinguistic structures.

Chapter 7 (Rachel Giora) is on default metaphorical, sarcastic, and metaphorically sarcastic constructions. Nine experiments and seven corpus-based studies have been run to test the Defaultness Hypothesis. Defaultness is defined in terms of an unconditional, automatic response to a stimulus. To be interpreted by default, stimuli should be novel, free of internal cues, such as semantic anomaly or internal incongruity, and free of contextual information. To prompt sarcasm by default, items should involve strong attenuation by means of negation of highly positive concepts; to prompt metaphoricalness by default, items should involve a negation marker. Results show that as predicted, such constructions were interpreted sarcastically and metaphorically by default. This was true of English, Russian, and German.

Part II: Central Topics in Cognitive Linguistics

This part presents an overview of the major central topics in cognitive linguistics. It begins from the basic notion of "embodiment" and proceeds to the common but intriguing topic of "linguistic synaesthesia".

Chapter 8 (Xu Wen and Canzhong Jiang) is about the cornerstone "embodiment" of Cognitive Linguistics or even the second generation of cognitive science. Mankind's cognitive processes are realized, not only in the brain, but also in the body and the world. Our concepts are shaped by the physical constraints of our body. "Embodiment in the field of cognitive science refers to understanding the role of an agent's own body in its everyday, situated cognition" (Gibbs 2005: 1). As a multidisciplinary theoretical construct in nature, embodiment is becoming a hot topic in various disciplines such as cognitive science, philosophy, psychology, sociology, and linguistics as well. It is also the basis on which the cognitive linguistics enterprise is built. Cognitive Linguistics assumes that language as part of cognition is not distinguished from general cognition. Therefore, language is also embodied given that general cognition is found to be embodied. This chapter examines what cognitive linguistic research has revealed about the embodiment of language from different aspects including conceptualization underlying language, language processing, language development, and language change.

Chapter 9 (Dennis Tay) is on image schemas forming the basic building blocks of abstract conceptual representations. They combine different sensory modalities and contribute rich inferential structures that underpin a diverse range of linguistic phenomena. They are discussed in various disciplines like philosophy, psychology, cognitive science, and cultural studies, and play a central role in key cognitive linguistic theories like cognitive grammar, force dynamics, and conceptual metaphor. Contemporary areas of application include language acquisition, literary and discourse analysis, design, and psychological counseling. This chapter aims at a comprehensive overview of image schemas with emphasis on the aforementioned aspects.

Chapter 10 (Xu Wen and Zhengling Fu) is concerned with categories and categorization. It starts by outlining the development, advantage, and limitations of four categorization theories, i.e., the classical theory, prototype theory, vantage theory, and the theory of idealized cognitive models. Level of categorization is then illustrated to reveal categorization structure and the interaction of different levels. Then the Chinese view of category is introduced. As a process of dynamic changes in categories, decategorization is discussed as well. This chapter finally addresses the application of categorization to fuzzy linguistics, translation study, and language learning and teaching.

Chapter 11 (Zoltán Kövecses) provides an explanation of the main features of what can be taken to be "standard" conceptual metaphor theory (as proposed by Lakoff & Johnson 1980, 1999),

alongside what can be called extended conceptual metaphor theory (as proposed by Kövecses 2020). Extended conceptual metaphor theory differs from the standard view in two particular ways; namely, in that it is not only a cognitive theory of metaphor but it has a strong contextual component and it views each conceptual metaphor as existing not only on a single level (that of domains or frames) but simultaneously on four hierarchical levels of schematicity (those of image schemas, domains, frames, and mental spaces).

Chapter 12 (Ruiz de Mendoza) addresses metonymy. Metonymy was first studied in connection to metaphor. As time went by, scholars began to identify areas of study where metonymy played an independent role too, such as illocution and grammatical conversion. Despite the increasing number of studies, including book-length ones, there is still a pressing need for an integrative framework that levels out the differences among competing accounts. This chapter overviews some major proposals on the nature and scope of metonymy and offers a comprehensive framework capable of integrating previous insights and offering solutions to some of the still problematic aspects of the phenomenon.

Chapter 13 (Walter De Mulder) is about force dynamics. It is a notion developed by Leonard Talmy to designate a schematic conceptual system grounding not only the meaning of causatives, but also that of other verbs and expressions which all express in some way the exertion and interaction of forces or have meanings that can be analyzed as such, albeit metaphorically.

Chapter 14 (Zeki Hamawand) explores the phenomenon of construal and underlines its significance in language. In Cognitive Linguistics, the use of a linguistic item is governed by the particular construal imposed on its content relative to the communicative needs of the discourse. Construal refers to the mental ability of a speaker to conceptualize a situation in alternate ways. Making use of the lexical resources provided by language, the speaker can map the conceptualizations into different linguistic realizations. Each linguistic realization may describe the same content but does so in a peculiar way. The aim is to show that no two expressions are synonymous even if they share the same conceptual content. They differ in terms of the type of construal or dimension of construal which the speaker employs to describe their common content. Each construal or dimension of construal represents a distinct meaning, namely each expression imposes a particular image on the content it describes.

Chapter 15 (Canzhong Jiang and Kun Yang) discusses concepts and conceptualization. These two terms are closely related and frequently invoked but tend to be under-specified when employed in Cognitive Linguistics. The chapter first specifies cognitive linguistic stances on such critical issues concerning concepts as their ontological status, structure, origin, and relation to language. Then six parameters are put forward for characterizing the nature and properties of conceptualization. Conceptualization can be investigated from both within and outside in terms of the psychological and the sociological. The chapter briefly illustrates how Cognitive Linguistics has handled these two issues.

Chapter 16 (Günter Radden) reviews recent research on iconicity, as well as discussing and illustrating the three primary types of iconicity. Iconicity refers to the perceived resemblance between the form and meaning of a sign. Imagic iconicity, as in *cuckoo*, represents a direct similarity between form and meaning. Diagrammatic iconicity, as in *I came*, *I saw*, *I conquered*, involves a similarity between two relationships, in this case, between a sequence of words and a sequence of times. Associative iconicity, as in *crash*, receives its iconicity by relating the word to a paradigm of similar words.

Chapter 17 (Klaus-Uwe Panther) argues that motivation is an explanatory concept in linguistic theorizing. After a brief introduction that contrasts the everyday conception of motivation with its theoretical use in cognitive linguistics, some historical landmarks of the concept are selectively presented ranging from antiquity to present-day linguistics. On the basis of C. S. Peirce's threefold classification of signs into symbols, indexes, and icons, a model is proposed that distinguishes

between language-internal and language-external factors of motivation. The workings of each type of motivation are illustrated with mostly English-language examples.

Chapter 18 (Renata Enghels and Mar Garachana Camarero) is on language change. Linguistic change is considered as the collective entrenchment of an innovative language trait which was first produced by individual language users when striving for communicative success and efficiency. Over the last few decades, different theories have been developed in order to understand how and why these processes of language change come about. This chapter zooms in on the main differences and similarities between three major approaches to these phenomena, namely grammaticalization, lexicalization, and the more recent theory of constructionalization.

Chapter 19 (Lieselotte Brems) presents a critical overview of the different—and sometimes conflicting—definitions of intersubjectivity found in the literature. In general terms intersubjectivity concerns the linguistic realization of a speaker's attention to a hearer. The chapter proposes a typology of subtypes of intersubjective meanings (attitudinal, responsive, and textual), based on the kind of hearer-attention or addressee-accommodation they involve. It zooms in on the relationship with subjectivity and (inter)subjectification, and tries to propose a number of formal recognition criteria for this pragmatic-semantic notion.

Chapter 20 (Frank Brisard) is about grounding. Grounding is what is needed to single out an instance of a type or, in other words, to achieve reference in discourse. A so-called grounding predication is essential to the formation of a nominal or a finite clause. It invokes the ground (the speech event, its participants, and the immediate circumstances) 'subjectively' and specifies a minimal, epistemic relationship with the referent. Grounding is seen as a semantic function which can be grammatically implemented in various ways, most prototypically by means of deictic and quantificational expressions. Due to the basic human concerns from which it arises, grounding is both universal and indispensable for coherent discourse and successful interaction.

Chapter 21 (Salvatore Attardo) is about humor. The origins of the cognitive linguistics of humor are examined, with a particular emphasis on the connections with and differences from the General Theory of Verbal Humor and specifically frame and script semantics. In this chapter, various cognitive mechanisms are examined, including frame shifting, blending, trumping, and metaphors. It is concluded that there are no humor-specific mechanisms: Humor "recycles" cognitive mechanisms that appear in serious communication. Promising areas of research are examined, such as embodied cognition, stylistics and construction grammar, and the connections between humorous metaphors and humor research.

Chapter 22 (Francesca Strik Lievers, Chu-Ren Huang, and Jiajuan Xiong) deals with linguistic synaesthesia. Synaesthesia in language consists in the combination of linguistic expressions referring to different sensory modalities, as in "bitter voice". This chapter first addresses the debate on the definition of synaesthesia, arguing that it is a type of metaphor. Next, it reviews research on preferences in synaesthetic sensory combinations; for instance, many studies show that, in several languages, hearing is very frequently a target of synaesthetic transfers (as in *bitter voice*) but rarely a source. Finally, it is suggested that such strong cross-linguistic preferences as well as minor language-specific differences may be accounted for by a combination of perceptual, cultural, and linguistic factors.

Part III: Interface between Cognitive Linguistics and Other Fields or Disciplines

This part includes 14 chapters, which explore the interface research between Cognitive Linguistics and other disciplines or fields.

Chapter 23 (Chris Sinha) reviews the history, main theoretical issues, methods, and selected key research topics in the study of language, culture, and cognition. It emphasizes the interdisciplinary nature of the field, summarizing the contributions of anthropology and psychology as well as

linguistics. It traces the development of cultural linguistics from anthropological and cognitive linguistic traditions. The history and present status of the theory of linguistic relativity, as well as current approaches drawing upon extended embodiment, are discussed. The key research topics of color, space and time, and self and identity are addressed, and the state of the art is summarized in each of them.

Chapter 24 (Herbert L. Colston) is about figurative language from the perspective of Cognitive Linguistics. Cognitive Linguistics was founded in part on the cognitive commitment—the promise that linguistic models, explanations, theories, accounts, etc., of language functioning in people would adhere to what we know about human cognitive functioning in general. This commitment, when applied to explanations of figurative language, has had significant impacts. Probably the most widely known such effects have been on accounts of metaphor and, by extension, figures that can contain metaphors like idioms and proverbs and metonymy. But other figurative language treatments (as well as figurativity in other media) have also embraced content from cognitive psychology or cognitive science (e.g., using prototype accounts to discuss idioms, using perceptual contrast and distinctiveness to account for verbal irony, hyperbole, and some of their pragmatic effects, invoking cognitive biases (e.g., for positivity), or schemas, when dealing with verbal irony, indirect negation, proverbs, etc.). The chapter first reviews briefly these successful adherences to the cognitive commitment in accounts of figurative language. But it also suggests ways in which the accounts could do more. Further critique is also presented on needed extensions of the cognitive commitment into other domains of human functioning which impact figurative language production and comprehension.

Chapter 25 (Jan Nuyts) deals with how humans anchor newly acquired information in their long-term knowledge of the world, by qualifying it along a range of dimensions, including aspect, time, and types of modality. It shows how these dimensions are organized in a hierarchical system, it explores the basic cognitive principles underlying this organization, and it discusses how this system plays a critical role in the process of (inter)subjectification, as a major mechanism of diachronic semantic change.

Chapter 26 (Marco Mazzone) is an account of cognitive pragmatics which is the study of the psychological processes involved in human communication in context, especially on the side of comprehension. Paul Grice laid the foundation for this field by describing comprehension as a form of inference-based intention recognition. This chapter presents Grice's framework, describes how Sperber and Wilson's Relevance Theory develop it, and defends it against criticisms leveled at both the notion of communicative intention and inferential pragmatic processing. It also argues that inference-based intention recognition may include recognition of conventional patterns as a component, which would allow for a theoretical convergence between Grice's and Austin's paradigms.

Chapter 27 (Jeroen Vandaele) starts with an overview of important topics, perspectives, and problems in cognitive poetics, and then takes poetic metaphor theory as a central case. First, it discusses Conceptual Metaphor Theory in relation to Aristotle and poetic metaphor. Second, it expounds other cognitive views of metaphor and relates them to poetics: Interaction Theory, Relevance Theory, Blending Theory, Bidirectionality Theory, and the class inclusion hypothesis. Third, it discusses aspects of form. Fourth, it proposes an interdisciplinary template for further analysis. Finally, it connects its discussion of poetic metaphor with the aims of (cognitive) poetics.

Chapter 28 (Ulrike Schröder) outlines the most basic lines of research in the field of cognitive linguistics and discourse studies. In particular, the focus is on two shifts which discourse studies on cognitive phenomena have undergone during the past three decades: the first being a shift to contextual, sociolinguistic, cultural, and individual variation, the second being a shift to real language use with growing interest in spoken and multimodal data. Based on examples of each domain, the chapter gives an overview of how studies have evolved around topics such as metaphor, metonymy, blending, construction, viewpoint, and discourse models in general.

Chapter 29 (Sherman Wilcox and Rocío Martínez) offers an overview of signed language linguistics. A brief description of American Sign Language (ASL) provides the background to linguistic analyses of signed languages. Critical issues include iconicity, metaphor, metonymy, mental spaces, grammaticization, evidentiality and modality, and pointing. A final section focuses on two themes concerning the relation between signed languages and gesture. The first describes the process by which gestures are incorporated into a signed language. The second examines the claim that some signs are fusions of linguistic and gestural material.

Chapter 30 (Julius Hassemer and Vito Evola) focuses on functional and formal aspects found in gesture studies highlighting their relationship with cognitive linguistics. The analysis shows the need for research on gestural meaning-making, or "gesture phonology", as well as gesture categorization. It concludes by touching upon future directions in the area of human computer interaction.

Chapter 31 (Kairong Xiao) is an exploration of translation studies from the perspective of cognition. The linguistic approach to translation studies has met criticisms for its prescriptive nature or its focus on linguistic transfer. Cognitive Linguistics offers a different consideration of translation with a cognitive paradigm in which translation is seen as a humanized, individualistic, and cognitive activity. It provides Translation Studies with innovative theoretical frameworks, analytic tools, and research methodologies while contributing to the emergence of Cognitive Translation Studies. Future developments might be seen in the elaboration of the theoretical frameworks, the interaction between the Cognitive Linguistic approach and empirical research, and the integration of Cognitive Linguistics with other branches of cognitive science for the modeling of translational cognition.

Chapter 32 (Dilin Liu and Tzung-Hung Tsai) explores how cognitive linguistics may inform, inspire, and enhance language pedagogy. It covers the following issues: (i) historical perspectives on language pedagogy, including new perspectives offered by cognitive linguistics; (ii) critical issues and topics related to the application of cognitive linguistics to pedagogy; (iii) current contributions and research; (iv) recommendations; and (v) future directions in this area of work.

Chapter 33 (Han Luo) investigates the application of Cognitive Linguistics in second language acquisition. There has been a consensus among scholars that the very foundations of cognitive linguistics (CL) make it well suited for shedding light on second language acquisition (SLA). The usage-based principle lies at the heart of the connection between CL and SLA. In order to explain the impact of CL on SLA research and language pedagogy, this chapter first discusses the key tenets of CL and their implications for SLA, and then moves to the usage-based theory of language acquisition, followed by a review of the CL-inspired approach to L2 instruction, and finally concludes with suggestions for future research.

Chapter 34 (Esra' M. Abdelzaher) outlines the intersection between cognitive linguistic theories and digital lexicography since the introduction of *Longman Language Activator* to the creation of FrameNet and MetaNet. It also discusses polysemy, senses separation, and idiom definitions from cognitive and lexicographic perspectives. The chapter explores the current research on the use of cognitive linguistic theories in the addition of new features to dictionaries and highlights the dominant methods applied in the field. Finally, empirical evidence and the combination of compatible cognitive theories are recommended for future research.

Chapter 35 (Nataliya Panasenko) shows the perspective of the basic notions and methods of cognitive linguistics in the analysis of a specific term system—medicinal plants' names, or phytonyms, in Romance, Germanic, and Slavic languages. The author presents different domains and schools of cognitive linguistics and shows, in numerous examples, how the ideas offered and developed by scholars can help explain motivational features of herbs' designation. The results of the onomasiological and cognitive analysis show how information processing channels, such ways of information processing as metaphor and metonymy, and stages of human cognitive activity are reflected in phytonymic lexicon.

Chapter 36 (Sadia Belkhir) offers a piece of research into the interplay between cognitive linguistics and proverbs. Its major aim is to suggest a cross-cultural cognitive linguistic approach to the treatment of proverbs to satisfy a lack within Conceptual Metaphor Theory (CMT)—both its early version (Lakoff & Johnson 1980; Lakoff & Tuner 1989), and its more recent standard version, Cultural Cognitive Theory (Kövecses 2005). It first briefly reviews cognitive linguistics and draws on some theoretical issues in the study of proverbs within CMT. Then, it recommends a cognitive approach to cross-cultural metaphoric variation and provides illustrative examples of source-target domain mappings within some animal-related proverbs from Kabyle, Arabic, French, and English in comparison and contrast.

Part IV: New Directions in Cognitive Linguistics

This part is a description of the new directions of Cognitive Linguistics. It is really rather risky to predict new trends of a discipline, but we have to take the risk nonetheless. In addition to the well-known "social turn" and "quantitative turn", here we list several important new directions zooming in on Cognitive Linguistics, which include (we give them temporary names) cognitive neurolinguistics, cognitive evolutionary linguistics, diachronic construction grammar, multimodal cognitive linguistics, cognitive biolinguistics, radical embodied ecolinguistics, and cognitive linguistic typology.

Chapter 37 (Rutvik H. Desai and Nicholas Riccardi) is about the cognitive neuroscience of language. It is well known that the study of the neural basis of language has a long history and a rich body of recent work that leverages modern neuroscientific methods. This chapter, starting from historical foundations, provides an introductory review of recent progress in understanding the neural basis of some of the major aspects of the language system. After introducing aphasias, the authors sketch the main components of semantics, speech perception and production, sentence comprehension and production, as well as reading and writing systems of the brain, relying primarily on evidence from neuroimaging and lesion studies. This work highlights both the striking progress that has been made in understanding the brain bases of language, and the many outstanding issues.

Chapter 38 (Gábor Győri) discusses how the theory of Cognitive Linguistics relates to the study of the emergence of language in human evolution. It examines what the cognitive linguistics approach to the nature of language and to its structure and function has to offer for language evolution studies. On the other hand, it also looks into how evolutionist approaches to the origin of language contribute to and correlate with the tenets of Cognitive Linguistics. It is concluded that the theoretical framework of Cognitive Linguistics is in full agreement with a Darwinian evolutionary account and cultural evolutionary explanation of the origins of human cognition and language.

Chapter 39 (Dirk Noël and Timothy Colleman) is about the diachronic dimension of construction grammar. Diachronic construction grammar is a field of cognitive linguistics which takes a construction grammatical theoretical perspective to the study of linguistic change and which descriptively traces the development of constructions and constructicons. This chapter surveys its core conceptual apparatus and sketches the still young history of the discipline. It critically discusses the theoretical distinction between 'constructionalization' and 'constructional change' and introduces research clusters on changes in productivity and/or schematicity, diachronic constructional semasiology, the disappearance of constructions, connectivity changes in the constructional network, and contact-induced constructional change. The chapter ends with a methodological consideration of the cognitive relevance of corpus research in diachronic construction grammar.

Chapter 40 (Charles Forceville) is on multimodality. While it is clear that communication can draw on many semiotic resources, research in the humanities has hitherto strongly focused on its verbal manifestations. "Multimodality" labels a variety of approaches and theories trying to remedy this bias by investigating how visuals, music, and sound, for instance, contribute to meaning-making. The contours of what is developing into a new discipline begin to be discernible. This

chapter provides a brief survey of various perspectives on multimodality, addresses the thorny issue of what should count as a mode, and makes suggestions for further development of the fledgling discipline.

Chapter 41 (Kleanthes K. Grohmann and Maria Kambanaros) explores the biological foundations of language. Biolinguistics at large takes the biological underpinnings of language seriously. This chapter outlines the basic tenets of the biolinguistic approach framed in the form of five 'foundational questions'. While often construed with generative investigations of language, biolinguistics is not, and should not be, another term for generative grammar; the biolinguistic approach to the study of language will thus be put in a broader perspective by inspecting and dissecting the foundational questions, with particular reference to cognitive linguistics. The novelty laid out here is the regular reference to 'macro-' and 'micro-cognitive' linguistics. Finally, a specific research agenda will be singled out: language pathology in a comparative biolinguistics.

Chapter 42 (Sune Vork Steffensen and Stephen J. Cowley) links evolutionary theory, ecolinguistics, and cognitive science. Building on methodology, the authors trace innovation, not to mental content, but to how languaging in a human life-world, or extended ecology, entangles acting with (limited) understanding. Work focused on discourse about the environment thus meshes with how the consequences of praxis draw on languaging. Indeed, understandings, sayings, and actions become central factors in the future of evolution. In conclusion, it is suggested that ecolinguists should not only strive to raise bio-ecological awareness but, in Peter Finke's terms, also aspire to build a scientific culture that favors life on earth.

Chapter 43 (Yuzhi Shi) is about cognitive linguistic typology. It has been widely accepted that cognitive linguistics and linguistic typology are closely related to each other, that is, the former provides an appropriate framework to explain cross-linguistic regularity and the latter serves to prove some theoretical tenets or hypotheses of the former. The central point here is how to understand the so-called cross-linguistic regularities or language universals. Langacker (2013) considers them as syntactic categories such as nouns and verbs, whereas Croft (2016) thinks of them as Greenbergian universal correlations. Through analyzing various types of passive structures across languages that are most diverse among all grammatical categories, this chapter focuses on the limitation of the possible cross-linguistic variation in markings and forms for a given grammatical category, which can be successfully explained by means of the concept "construal", a central point in cognitive linguistics. On the other side, evidence from linguistic typology shows that every element comprising a construction is meaningful, which validates one of the major tenets of cognitive linguistics.

4. Conclusions

This handbook provides an overview of the Cognitive Linguistics enterprise from various dimensions. Although Cognitive Linguistics only has a short history of 40 years, its rapid development and great achievements are well known to all linguists.

As we know, the study of Cognitive Linguistics is not confined to understanding language alone, but explaining real linguistic phenomena through the exploration of cognitive processes hidden in the brain and mind. More importantly, through exploring the mental processes we can understand and elucidate a large number of social, psychological, and cultural phenomena. In other words, the description of cognitive processes in Cognitive Linguistics is not only a way to explain linguistic phenomena, but also a methodology to observe the realities of society and culture, and understand humankind's social psyche. Therefore, we believe that Cognitive Linguistics is not only a paradigm of linguistics, but also a cognitive social science, which can have many implications for various fields or disciplines in the age of big data. And we hope that the present handbook can sufficiently make this point and do so in many ways that will be informative and valuable to students and researchers of Cognitive Linguistics and other disciplines.

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PART I

Basic Theories and Hypotheses



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1
COGNITIVE SEMANTICS

Dirk Geeraerts

1. Introduction

Cognitive semantics as meant in this chapter refers to the diverse set of models developed within cognitive linguistics for the description of linguistic meaning. This includes concepts like prototypicality, radial networks, metaphor, metonymy, frame semantics, and a wide range of construal mechanisms in grammar (see section 3 for a more systematic overview). As all of these models are treated in detail in separate chapters of this Handbook, the present chapter intends to focus on the shared characteristics of these descriptive models: what is it that brings them together, and why do they go under the label of cognitive semantics? That question will be answered from three different perspectives. The first perspective approaches the matter in the wider framework of the history of linguistic thinking: why is the study of meaning so particularly important for cognitive linguistics, when we situate cognitive linguistics at large against the background of the history of linguistics? Or in other words: how does cognitive semantics, understood as the cluster of concepts illustrated above, contribute crucially to the position of cognitive linguistics in the development of linguistic theory? A second approach for looking beyond the individual approaches involves their mutual relations: what are the links that connect these various models? How are they complementary with regard to each other in covering the domain of natural language semantics? And in addition, looking for commonality rather than complementarity: what are the shared features that allow us to claim that cognitive semantics is indeed a more or less coherent framework for the description of meaning, rather than a loose collection of weakly connected formats? To round off, we will look beyond the separate ideas in yet another way, by looking forward rather than backward: what open fundamental questions does semantic description in cognitive linguistics face, and how might they influence the further development of the field? (The chapter brings together a number of ideas included in Geeraerts 2006, 2016.)

2. Cognitive Semantics in the Recent History of Natural Language Semantics

To understand the specific position of cognitive linguistics in the history of linguistic semantics, we first need to get back to the beginning of generative grammar. In the framework defined by Noam Chomsky's *Syntactic Structures* of 1957, meaning does not play a role in the conception of grammaticality (and *a fortiori*, in the grammar as the rule system governing that grammaticality). The

iconic sentence *Colorless green ideas sleep furiously* is considered meaningless, but at the same time it is taken to be grammatical, because its syntactic structure corresponds entirely to a fully grammatical sentence like *Bright young linguists talk endlessly*. Meaningfulness in other words is not a criterion for grammaticality, but syntactic well-formedness is.

In the 1965 model defined by *Aspects of the Theory of Syntax*, Chomsky switches position. The description of meaning is incorporated into the grammar, and while *Colorless green ideas sleep furiously* is still considered to be meaningless, it acquires the status of an ungrammatical sentence that needs to be excluded by the formal grammar. The incorporation of meaning and semantic well-formedness into the heart of the grammar does however create a problem in combination with the notion of transformation, which was at that point another crucial aspect of the formal framework of generative grammar. The algorithmic description of the grammatical structures of a language went in two steps. First, phrase structure rules produce an initial syntactic tree (the so-called 'deep structure'), which may then, second, be transformed into a different type of tree, the 'surface structure'. The question whether transformations are meaning-preserving then became a hotly debated topic in generative theory, ultimately leading to a rift between two virulently opposed camps.

On the one hand, if you believe that transformations are meaning-preserving, all the semantic information you need is already available in the deep structure, and the deep structure as such becomes equivalent to semantic description. Semantics accordingly takes precedence in the linguistic description. This was the position taken by the so-called Generative Semantics movement, which in works like McCawley (1968) developed its program by creating a rather awkward fusion of linguistic syntax with descriptive notions taken from formal logic.

On the other hand, if you believe that transformations can change meaning, the primacy of syntax can be maintained: semantic interpretation will be placed at the end of the process of building grammatical tree structures. This was the position that was ultimately favored by Chomsky, for reasons that can be easily understood in light of one of Chomsky's basic motives, namely to explain the process of language acquisition. If, like Chomsky, you believe in a genetic endowment for language, then it is highly unlikely that that genetic module will involve something as ephemeral and diverse and variable as meaning. If there is an ingrained linguistic knowledge at all, it is more likely to pertain to the formal, structural aspects of the language, i.e., to syntax, precisely also because syntax underlies that other main feature of language emphasized by Chomsky: the capacity of human beings to produce an infinite number of different sentences.

So, within the generative tradition, Generative Semantics lost out against so-called Interpretive Semantics, which then became the first of a series of successive models within generative grammar ultimately leading to the current notion of Universal Grammar. What all of these models (and a number of other theories of formal grammar) have in common is the idea of an autonomous syntax, i.e., the notion that the syntax of the language is a module of the grammar that stands on its own and that can be described largely independently of considerations of meaning and function. Such a module may surely interact with semantics and pragmatics, but essentially works according to its own set of principles. But importantly, and somewhat ironically, the demise of Generative Semantics within the generative grammar tradition became an important stimulus for the development of semantics in two different traditions outside of generative grammar. First, some of the linguists who were active in the broad circle of Generative Semantics became founding figures of what we now know as cognitive linguistics. This applies to George Lakoff and Ron Langacker, and to some extent also to Charles Fillmore, who was a major inspiration for cognitive linguistics but who never self-identified as a cognitive linguist. Second, the rapprochement with logical semantics which was rather clumsily executed by Generative Semantics triggered people with a background in logic, like Richard Montague (1974) and Barbara Partee (1976), to develop a formal kind of natural language semantics that was firmly and unambiguously rooted in logical semantics, and that became the basis for the very rich tradition of formal semantics as we currently know it.

So overall, from the point of view of semantics, we may distinguish three broad strands of thought in current linguistic theory: **formal syntax**, **formal semantics**, and **cognitive semantics**. The first two share the interest in a formal, symbolically representational approach to linguistic description that was introduced by generative grammar, and while the first approach minimizes the role of meaning, the last two share the primacy of semantics that was unsuccessfully promoted within generative grammar by the Generative Semantics movement. But characteristically, the logical inspiration of formal semantics leads to an entirely different type of meaning description from what is common in cognitive linguistics. Not only is formal semantics couched in the formal language of logic, but it focuses on the truth-functional compositionality of linguistic utterances. Given a strictly referential conception of meaning, it examines how the truth-functional properties of an entire proposition are compositionally derived from the properties of its components. Cognitive semantics by contrast does not want to restrict linguistic meaning to its referential and truth-functional aspects, but starts from a broad conception of meaning in which imagery, affect, experience may all take pride of place, and in which rigid formalization becomes less of a desideratum. For instance, to come back to the sentence with which we started this section, cognitive linguistics will readily accept the possibility of a metaphorical reading of *Colorless green ideas sleep furiously* (in the sense, say, in which not very inspiring ecological ideas impatiently remain hidden and inactive)—a figurative interpretation that lies beyond the range of most types of formal semantics. So, as a first characterization of cognitive semantics, we can think of it historically as an approach in which demands of descriptive scope take precedence over the pursuit of formalizability. (At the end of the chapter, we will briefly come back to the history of cognitive linguistics.)

3. The Variety of Cognitive Semantic Models

The position of cognitive semantics in the landscape of contemporary semantics that we sketched from a historical perspective in the previous section now needs to be fleshed out: what are the dominant models for the analysis of meaning that have been proposed, and how do they relate to each other? As a first step, let us distinguish the three main groups of models that have been developed in the context of cognitive semantics. (To repeat, the purpose of this chapter is not to give an in-depth presentation of these models, but to analyze their relations and commonalities. The references in this section are restricted to just a few original publications for each of the topics. More can be found in the separate chapters of this Handbook.)

First, a number of ideas focus on the internal semantic structure of natural language expressions, i.e., the relationship between the various senses of the expressions. Thus, the **radial network** model (Lakoff 1987) describes a category structure in which a central case of the category radiates towards novel instances: less central category uses are extended from the center. Brugman's seminal study (1988) of *over*, for instance, takes the 'above and across' reading of *over* (as in *the plane flew over*) as central, and then shows how less central readings extend from the central case. These can be concrete extensions, as in a 'coverage' reading (*the board is over the hole*), but also metaphorical ones, as in temporal uses (*over a period of time*). Radial categories constitute but one type of a broader set of models that fall under the heading of **prototype theory** (Rosch 1978; Taylor 1989; Geeraerts 1989). In general, these look at the interaction between the extensional aspects of the category (specifically, the salience of category members) and their intensional aspects (the definitional demarcation between senses and the possibility of formulating a definition of the category in terms of necessary and sufficient features). This interaction can take various forms, to the extent that it has been argued that *prototype* is itself a prototypically structured concept, i.e., that there is no single definition that captures all and only the diverse forms of 'prototypicality' that linguists have been talking about.

Second, other branches of cognitive semantics concentrate on the conceptual mechanisms that realize the creation of new meanings, specifically, metaphor and metonymy. The notion of

conceptual metaphor (introduced by George Lakoff and Mark Johnson's book *Metaphors we live by* of 1980) captures the recognition that a given metaphor need not be restricted to a single lexical item, but may generalize over different expressions. Such general patterns may then be summarized in an overall statement like LOVE IS WAR, a pattern that ranges over expressions like *He is known for his many rapid conquests, he fled from her advances, she is besieged by suitors*. The attention to metaphor sparked off a number of related concepts. **Image schemas** (Johnson 1987; Hampe 2005) are regular patterns of sensory or motor experiences that recur as a source domain (or a structuring part of a source domain) for different target domains. Typical image schemas include containment, path, scales, verticality, and center-periphery. If metaphor is analyzed as a mapping from one domain to another, the question arises how such mappings take place: how does the structure of the source domain get mapped onto the target domain? The notion of conceptual integration (a.k.a. blending) developed by Gilles Fauconnier and Mark Turner (Fauconnier 1985; Fauconnier & Turner 2002) provides a descriptive framework to answer that question; it describes the derived reading as a merger of the source space and the target space. Although this **mental spaces** approach clearly links up with the analysis of metaphor as mapping across domains, the conceptual integration framework is more general, in the sense that it can be applied to a variety of phenomena, many of which (like counterfactuals) are not related to metaphor. Although less dominant than conceptual metaphor and its offshoots, **metonymy** research (Kövecses & Radden 1998; Barcelona 2000; Dirven & Pörings 2002) also received an important impetus in cognitive semantics, more specifically from the suggestion that metonymy could receive a definition that mirrors that of metaphor: if metaphor is seen as a mapping from one domain to the other, metonymy can be seen as a mapping *within* a single domain or a domain matrix. This suggestion is not without issues (the relevant definition of 'domain' is not self-evident), but regardless, the cognitive linguistic study of metonymy is thriving.

A third group of models examines the mechanisms of **grammatical construal** in languages: how do the grammatical resources of a language contribute to the conceptualization of reality? This approach, epitomized by the work of Ron Langacker (1987, 1991) and Len Talmy (2000), analyzes the semantic import of syntactic, morphological, constructional mechanisms. Thus, for instance, Langacker suggests a semantic definition of word classes. On conceptual grounds, he distinguishes between a number of basic classes of predications: entities and things versus relations, and within the relational predicates, stative relations, complex atemporal relations, and processes. The formal word classes of a language, he then argues, typically express a basic type of predication. For instance, while nouns express the notion of 'thing' (a bounded entity in some domain), adjectives will typically be stative relational predicates, and verbs processes. Langacker's grammatical model is a systematic exploration of such dimensions of construal, which further include, among others, perspective (described in terms of figure/ground alignment) and prominence (described in terms of base/profile configurations). Similarly, Talmy describes various conceptual subsystems underlying grammatical constructs, like force dynamics and causation, attention phenomena, plexity, event structures and their lexicalization. Importantly, construal does not just involve the semantics of separate forms of expression, but crucially presupposes the presence of alternatives, of different ways of portraying reality. Accordingly, studies of grammatical construal tend to look at the systems lying behind functionally equivalent or near-equivalent alternatives. In Talmy's work on lexicalization patterns of motion events, for instance, the variation shows up typologically: 'verb-framed' languages encode the path of motion into the verb whereas 'satellite-framed' languages encode it in a particle, a prepositional phrase or similar. But the alternatives can obviously also exist within a single language. **Frame semantics** (Fillmore 1977, 1985) is an influential model describing intralinguistic alternative argument structure choices. One essential starting point is the idea that one cannot understand the meaning of a word (or a linguistic expression in general) without access to all the encyclopedic knowledge that relates to that expression. For example, in order to understand the word *sell*, you need to have world knowledge about the situation of commercial transfer. This comprises, apart

from the act of selling, a person who sells, a person who buys, goods to be sold, money or another form of payment, and so on. A semantic frame of this type is a coherent structure of related concepts where the relations have to do with the way the concepts co-occur in real world situations. Specific patterns of expressions evoke the frame and highlight individual concepts within the frame. In the standard commercial transaction example, for instance, *sell* construes the situation from the perspective of the seller and *buy* from the perspective of the buyer.

4. Complementarities and Commonalities of Cognitive Semantic Models

Now, if we examine the complementarity between the various cognitive semantic approaches in our overview, it would be deceptive to think primarily in terms of lexically oriented versus grammatically oriented sets of approaches. Admittedly, some of the models find their origin primarily in lexical questions, while others have an outspoken grammatical perspective, but the distinction between the two is not clear-cut, for two reasons. First, phenomena like prototypicality and metaphoricity are general characteristics of linguistic categorization, and accordingly, they can be, and are, applied to grammatical categories just as well as to lexical ones. Second, cognitive linguistics does not really believe in a strict separation between the lexical and grammatical level of linguistic structure. Specifically with the emergence of construction grammar, it has become a widely accepted idea that there is a continuum between lexical forms and abstract syntactic patterns. It follows that the relevant semantic mechanisms can also not be strictly separated into two neat groups.

Rather, the complementarity of the approaches resides in the fact that they tap into two fundamentally different **sources of conceptual construal**. On the one hand, reality may be understood on the basis of existing concepts, i.e., concepts that are already represented in the language. In prototypical models of categorization, existing senses of an expression form the basis for conceptualizing new instances: as a rule of thumb, peripheral cases of the category are introduced on the basis of their conceptual link, like similarity, with the central ones. Metaphor and metonymy are specific cases of the same mechanism: new meanings are constructed by taking a starting point in an existing concept that is related to the target concept by links of figurative similarity or contiguity.

On the other hand, conceptual construal may rely on cognitive capacities and processes that are not of a specifically linguistic kind. This is the case, for instance, with Langacker's analysis of perspective, or with Talmy's attentional subsystem. As an illustration, consider spatial perspectives in linguistic expressions, and how they can construe the same objective situation linguistically in different ways. Standing in the back garden and describing the position of a bicycle, someone could say either *It's behind the house* or *It's in front of the house*. These would seem to be contradictory statements, except that they embody different perspectives. In the first expression, the perspective is determined by the way the speaker looks: the object that is situated in the direction of the gaze is in front of the speaker, but if there is an obstacle along that direction, the thing is behind that obstacle. In this case, looking in the direction of the bicycle from the back garden, the house blocks the view, and so the bike is behind the house. In the second expression, however, the point of view is that of the house: a house has a canonical direction, with a front that is similar to the face of a person. The way a house is facing, then, is determined by its front, and the second expression takes the point of view of the house rather than the speaker, as if the house were a person looking in a certain direction. Seeing things in this way is not a primarily or typically linguistic skill, but approaches like Langacker's and Talmy's show how it shapes specific grammatical resources of the language.

By and large, the first two groups of models identified in the previous section embody the first perspective (construal based on existing linguistic concepts), whereas the third group illustrates the second perspective (construal based on general cognitive capacities). The division is not strict, though. Image schemata, for instance, invoking non-linguistic sensorial experience, constitute a link between the two perspectives.

As a next step, we may have a look at the characteristics explicitly or implicitly attributed to the general notion of meaning by most approaches to cognitive semantics. So far, we have looked at how the different types of cognitive semantics are complementary; now, we try to determine their shared conception of meaning: are there any features that they would all, or nearly all, predicate of the notion 'meaning'? The following three are particularly relevant. (It may be noted that one feature is conspicuously not included in the following list, namely the deceptively obvious one that meaning is 'cognitive'. The reasons for this omission will become clearer further on in the chapter: we will have to point out that the cognitive nature of meaning is less self-evident than it may seem at first sight.)

First, linguistic meaning is **perspectival**.—Given the important role that the notion of conceptual construal played in the previous pages, the perspectival nature of meaning need hardly be explained further. Meaning, according to cognitive semantics, is not just an objective reflection of the outside world, it is a way of shaping that world, it is a form of conceptual construal—and the various types of conceptual construal underlie the diverse descriptive models that are developed in cognitive semantics.

Second, linguistic meaning is **dynamic and flexible**.—Meanings change, and there is a good reason for that: meaning has to do with shaping our world, but we have to deal with a changing world. New experiences and changes in the environment require that people adapt their semantic categories to transformations of the circumstances, and that we leave room for nuances and slightly deviant cases. For a theory of language, this means that we cannot just think of language as a more or less rigid and stable structure: if meaning is the hallmark of linguistic structure, then we should think of that structure as flexible. Again, this is firmly ingrained in the approaches that we presented: a radial structure of senses (whether it is built up through prototypicality, metaphor, metonymy, or other mechanisms) is precisely the outcome of a flexible usage of existing concepts.

Third, linguistic meaning is **encyclopedic, non-autonomous, experiential**.—If meaning has to do with the way in which we interact with the world, it is natural to assume that our whole person is involved. The meaning we construct in and through the language is not a separate and independent module of the mind, but it reflects our overall experience as human beings. Linguistic meaning is not separate from other forms of knowledge of the world that we have, and in that sense it is encyclopedic and non-autonomous: it involves knowledge of the world that is integrated with our other cognitive capacities. There are three main aspects to this broader experiential grounding of linguistic meaning.

To begin with, we are embodied beings, not pure minds. Our organic nature influences our experience of the world, and this experience is reflected in the language we use. The *behind/in front of* example mentioned above provides a clear and simple illustration: the perspectives we use to conceptualize the scene derive from the fact that our bodies and our gaze have a natural orientation, an orientation that defines what is in front of us and that we can project onto other entities, like houses. Needless to say, the same reasoning applies to image schemata in general.

In addition, we are not just biological entities: we also have a cultural and social identity, and our language may reveal that identity, i.e., languages may embody the historical and cultural experience of groups of speakers (and individuals). Think of birds (as a typically prototypical category). The encyclopedic nature of language implies that we have to take into account the actual familiarity that people have with birds: it is not just the general definition of 'bird' that counts, but also what we know about sparrows and penguins and ostriches etc. But these experiences will differ from culture to culture: the typical, most familiar birds in one culture will be different from those in another, and that will affect the knowledge people associate with a category like 'bird'.

Finally, the experiential nature of linguistic knowledge needs to be specified in yet another way, by pointing to the importance of language use for our knowledge of a language. Words do not exist in the abstract; they are always part of actual utterances and actual conversations. The experience of language is an experience of actual language use, not of words like you would find them in a

dictionary or sentence patterns like you would find them in a grammar. That is why cognitive linguistics self-identifies as a usage-based model of grammar: if we take the experiential nature of grammar seriously, we will have to take the actual experience of language seriously, and that is experience of actual language use. From the point of view of mainstream 20th-century linguistics, that is a break with received ideas. The dominant tradition tended to impose a distinction between the level of language structure and the level of language use—in the well-known terms of Ferdinand de Saussure, between *langue* and *parole*. Generally (and specifically in the tradition of generative grammar), *parole* would be considered relatively unimportant: the structural level would be essential, the usage level epiphenomenal. In a usage-based model that considers the knowledge of language to be experientially based in actual speech, that hierarchy of values is obviously rejected.

5. Open Issues for Cognitive Semantics

The characterization of cognitive semantics that we gave in the previous pages triggers three closely related fundamental questions, one relating to the interpretation of *cognitive* in *cognitive semantics*, a second relating to the methodology of linguistic semantics, and a third relating to the theoretical integration of the approaches that we surveyed.

Simplifyingly, the first issue pits a predominantly **psycholinguistically oriented conception of language** against a rather more **sociolinguistically oriented conception**. To understand the background, we may first observe that the characterization of cognitive linguistics as 'cognitive' has basically (but largely implicitly) received two slightly different interpretations in the history of the framework. On the one hand, cognitive linguistics has been presented as adhering to the Cognitive Commitment, i.e., "a commitment to make one's account of human language accord with what is generally known about the mind and the brain, from other disciplines as well as our own" (Lakoff 1990: 40). According to this view, cognitive linguists will take into account the empirical findings of disciplines like cognitive psychology, developmental psychology, and the neurosciences, and attune their linguistic models accordingly. It will have, in other words, a largely psycholinguistic orientation. On the other hand, the editorial statement of the launching issue of the journal *Cognitive Linguistics*—the same issue, in fact, in which Lakoff formulated the Cognitive Commitment—defines cognitive linguistics in terms of a conception of language "as an instrument for organizing, processing, and conveying information" (Geeraerts 1990: 1). The distinction between the two formulations is subtle but real, involving features like the following.

First, a 'language as cognitive tool' view makes it easier to understand some of the core features of cognitive linguistics: the primacy of semantics in linguistic analysis, the encyclopedic nature of linguistic meaning, and the perspectival nature of linguistic meaning. The primacy of semantics in linguistic analysis follows in a straightforward fashion from the cognitive perspective itself: if the primary function of language involves knowledge and communication, then meaning in the broadest sense must be the prime focus of linguistic attention. The encyclopedic nature of linguistic meaning follows from the categorial function of language: if language is a system for the categorization of the world, there is no need to postulate a systemic or structural level of linguistic meaning that is different from the level where world knowledge is associated with linguistic forms. The perspectival nature of linguistic meaning implies that the world is not objectively reflected in the language: the categorization function of the language imposes a structure on the world rather than just mirroring objective reality.

Second, a 'language as cognitive tool' view allows for a clear demarcation between cognitive linguistics and generative grammar. The problem of demarcation arises because generative grammar, as part of the 'first cognitive revolution' of the 1950s, also considers itself to be a type of cognitive linguistics. So what is the difference between 'cognitive linguistics' as we know it, and 'cognitive linguistics' as applying to generative grammar? The cognitive linguist (in the sense of this Handbook) is interested in our knowledge of the world, and studies the question how natural

language contributes to it. The generative linguist, conversely, is interested in our knowledge of the language, and asks the question how such knowledge can be acquired, given a cognitive theory of learning. As cognitive enterprises, cognitive linguistics and generative grammar are similarly interested in those mental structures that are constitutive of knowledge. For the cognitive linguistic approach, natural language itself consists of such structures, and the relevant kind of knowledge is knowledge of the world. For the generative grammarian, however, the knowledge under consideration is knowledge of the language, and the relevant mental structures are constituted by the genetic endowment of human beings that enables them to learn the language. Whereas generative grammar is interested in knowledge *of* the language, cognitive linguistics is so to speak interested in knowledge *through* the language.

Third, and most importantly in the present context, a 'language as cognitive tool' interpretation of the label *cognitive linguistics* allows for a non-individualistic, sociohistorical rather than universalist interpretation of the cognition in question—an interpretation, in other words, in which 'language as cognition' encompasses shared and socially distributed knowledge and not just individual ideas and experiences. In this respect, we may note that cognitive linguistics in the new millennium is characterized by a growing attention to the social and cultural aspects of language, on three levels of analysis. These three levels are characterized by an increasing schematicity (Geeraerts & Kristiansen 2015). The first level considers variation within languages: to what extent do the phenomena that are typically focused on in cognitive linguistics exhibit variation within the same linguistic community? The research conducted within this approach links up with the research traditions of sociolinguistics, dialectology, and stylistic analysis, using the same meticulous empirical methods as these traditions: see among others Kristiansen and Dirven (2008). The next level is that of variation among languages and cultures, taking the form of cultural and anthropological comparisons or of historical investigations into changing conceptualizations across time periods (Palmer 1996; Sharifian 2017). The third level, beyond intralinguistic and interlinguistic variation, is that of language as such: here we can situate foundational studies that emphasize and analyze the way in which the emergence of language as such and the presence of specific features in a language can only be adequately understood if one takes into account the socially interactive nature of linguistic communication (among others, Sinha & Jensen de López 2000; Geeraerts 2005; Zlatev et al. 2008; Harder 2010; Schmid 2016).

This 'social turn' in cognitive linguistics has led to the formulation of a Sociosemiotic Commitment as a counterpart to the Cognitive Commitment, i.e., "a commitment to make one's account of human language accord with the status of language as a social semiotic, i.e. as an intersubjective, historically and socially variable tool" (Geeraerts 2016: 537). But the Cognitive Commitment and the Sociosemiotic Commitment do not necessarily converge: the former tends to favor a universalist perspective, the latter a sociohistorically variable one, and tensions between the two may exist. An early example (early in the history of cognitive linguistics, that is) of a universalist view contrasting with a culturally and historically informed view may be found in the debate about the basis of the ANGER IS HEAT conceptual metaphor. Lakoff and Kövecses (1987) interpreted the metaphor in terms of universal physiological experiences: increased body heat is taken to be a physiological effect of being in a state of anger, and anger is metonymically conceptualized in terms of its physiological effects. Geeraerts and Grondelaers (1995), however, pointed out that quite a number of the expressions illustrating the ANGER IS HEAT pattern are lexical relics with a historical basis in the theory of humors, the highly influential doctrine that dominated medical thinking in Western Europe from antiquity to early modern times. In recent years, taking a cultural and historical perspective in metaphor research has been gaining momentum and recognition, also among the major proponents of Conceptual Metaphor Theory: see Kövecses (2005).

It follows that sorting out the proper balance between psycholinguistic and sociolinguistic aspects of meaning will be important for the future development of cognitive semantics. This brings us to a second, closely related issue: **methodology**. Initially, cognitive semantics took shape in the

form of conceptual analysis: the meticulous and ingenious conceptual dissection of semantic phenomena of the types listed above. But since the turn of the millennium, new methods have become progressively more important in cognitive linguistics: experimental approaches on the one hand, corpus-based ones on the other. This shift is sometimes referred to as a 'quantitative turn', but it seems more appropriate to think about it as an 'empirical turn'. The semantic descriptions provided by the method of conceptual analysis are then to be seen as hypotheses that may be tested against experimental or corpus-based data. Although there is not a 100% fit, the experimental method links up with a psycholinguistic perspective: experimentation is the method *par excellence* of cognitive psychology at large. Conversely, corpus-based investigations link up rather with a sociohistoric perspective: again, an observational modus operandi is typical for sociolinguistics in the broader sense. But just as there may be a tension between a psychological and a sociohistorical view of cognition, experimental and corpus-based methods do not necessarily converge (see, e.g., Heylen et al. 2008; Gilquin & Gries 2009; Schmid 2010). Consequently, cognitive semantics could profit from a systematic investigation into the strengths and weaknesses, the value and the scope, the dos and don'ts of the alternative experimental designs and corpus techniques that have become available in the past two decades.

A third fundamental issue to consider for the further development of cognitive semantics is the **theoretical integration** of the various approaches. In spite of the complementarities and commonalities that we described in the previous sections, cognitive semantics does not constitute a single fully integrated theory of linguistic meaning. There is no capitalized Cognitive Semantics, as a comprehensively organized theoretical framework. To a considerable degree, the various descriptive models are developed alongside each other, to the extent that relatively little attention is devoted to examining their mutual relations. Specifically, the relationship between the two complementary fundamental types of construal—language-based or broadly cognitive—may profit from a closer examination, also because it relates to some extent to the distinction between a 'psycholinguistic' and a 'sociolinguistic' perspective that we came to discuss: language-based construal tends to be historically and culturally specific, whereas general cognitive capacities can be considered universal and individual. Accordingly, a closer look at how to relate the two fundamental forms of construal to each other should be high on the agenda.

To come back to the historical perspective of section 1, this situation can be seen as a reflection of the sociology of cognitive linguistics. In contrast with the dominant position of Noam Chomsky in generative grammar, the cognitive linguistic enterprise was from the very beginning a community effort, with innovative contributions coming from different individuals (many of whom were mentioned in the pages above) but also from various traditions. To specify the latter, cognitive linguistics received a major impetus in the mid-1980s when in the work of people like René Dirven, Brygida Rudzka, John Taylor, and the present author, the post-generative work of the predominantly Californian pioneers merged with the European legacy of structuralist and prestructuralist semantics (see Geeraerts 2010 for a more detailed treatment). The multiple sources from which cognitive linguistics sprang translated into a high degree of variation: at no point did cognitive semantics develop into a unitary doctrine. But the downside of that tolerance is a lower degree of theoretical integration: the field for further investigation is open …

Further Reading

Lemmens, M. (2015). Cognitive semantics. In N. Riemer (Ed.), *The Routledge handbook of semantics* (pp. 90–105). London: Routledge. (Will be very useful as a first synthetic deepening of the models presented in section 3.)

Geeraerts, D. (Ed.). (2006). *Cognitive Linguistics: Basic readings.* Berlin/New York: Mouton de Gruyter. (Brings together twelve foundational articles by leading figures in the field, specifically also including the models of semantic description discussed in the present chapter.)

Glynn, D., & Fischer, K. (Eds.). (2010). *Quantitative methods in cognitive semantics: Corpus-driven approaches*. Berlin/New York: Mouton de Gruyter. (Offers a survey and illustration of new empirical methods in cognitive semantics, with an emphasis on corpus approaches.)

Related Topics

cognitive grammar; construction grammar and frame semantics; categorization; image schemas; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; construal; concepts and conceptualization; cognitive sociolinguistics

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2
COGNITIVE GRAMMAR

Cristiano Broccias

1. Introduction

Cognitive Grammar (CG) was developed in the late 1970s by the American linguist Ronald Langacker (see Langacker 1987, 1991, 1999, 2000, 2008a, 2009; Taylor 2002) as a radical alternative to generative grammar. Since its inception, CG has eschewed formalism for formalism's sake and has refuted key generative assumptions such as the claim that language and general cognition are separate, that language can be modeled as a set of autonomous modules (e.g., lexicon, syntax, phonology, semantics) linked to each other by means of interfaces and, consequently, that grammar is meaningless. CG emphasizes that much in language is a **matter of degree** and thus contends that lexicon and syntax as well as semantics and pragmatics form a **continuum** rather than separate modules. In a similar vein, CG takes issue with the traditional building-block view of meaning construction, namely the claim that meaning is by and large compositional. Instead, CG claims that words are merely prompts for activating a rich array of knowledge domains, parts of which can be combined quite flexibly and creatively. For example, a *blue pen* can be a pen whose ink is blue, a pen whose whole casing, or even only part of it, is blue, or a pen used by a team in blue and so on.

As an alternative to generative grammar, CG can be classified as a functional-cognitive theory of language. It purports to describe language from a functional perspective in that **functional** considerations (e.g., the interactive function of language) are taken to be foundational rather than derivative, and is **cognitive** because it contends that general cognitive abilities (e.g., memory, categorization, perspectivization) shape language production and language understanding.

Within the functional-cognitive camp, Cognitive Grammar bears some similarity to current constructionist approaches such as Goldberg's Construction Grammar (CxG) and Croft's Radical Construction Grammar (RCG), see Chapter 3, this volume. For example, it shares with CxG and RCG the view that lexicon and syntax make up a continuum, often referred to as the constructicon in CxG, and that our knowledge of a language can be reified, metaphorically speaking and up to an extent, into a network of constructions linked by categorizing relationships of instantiation and extension.

Despite constructionist approaches having entered the linguistic mainstream, Cognitive Grammar is still quite radical. Both CG and constructionist approaches hold that constructions are pairings of form and meaning but, whereas constructionist approaches equate form with syntax, CG identifies **form** with the **phonological pole**, which, under a broad definition, does not only include

segmental phonology but also intonation and gesture, collectively known as expression channels (Langacker 2001a). Syntax in CG is meaningful as it consists in (schematic) pairings of form (the phonological pole of an expression) and meaning (the semantic pole of an expression).

Another major distinctive feature of CG is the claim that word classes (e.g., noun and verb) and grammatical functions (e.g., subject and object) are not primitive notions but are definable in conceptual terms. Also, at least nouns and verbs are regarded as universal. Despite being radical, CG does not do away with traditional grammatical terminology but uses traditional grammatical notions as convenient labels for capturing recurring conceptual configurations so that the coverage of traditional labels may not be as unambiguous as other theories may assume.

A further point of departure from more traditional approaches is the view that classical (i.e., hierarchical) constituency is neither necessary nor desirable. The dynamic nature of language points to the fact that linguistic organization may in fact be flat and serial. Indeed, the interest in dynamicity coincides with a new momentum in CG research by Langacker. Whereas up to the end of the 20th century, CG mainly concerned itself with setting up a descriptive framework alternative to the mainstream generative model, since the beginning of the 21st century CG (see, e.g., Langacker 2001a and 2001b) has turned its attention to language processing and broader concerns such as discourse with the aim of offering a unified account of structure, processing, and discourse.

In what follows, I will illustrate some of the key points raised so far in more detail, by focusing on the 'constructicon', a selection of cognitive abilities and models relevant to language, the characterization of word classes and grammatical functions, and the issue of the relation between (classical) constituency and dynamicity.

2. The Grammar-Lexicon Continuum

A language ultimately resides in patterns of neural activation. Nevertheless, it is useful to conceptualize a language as a **structured inventory of conventional linguistic units**. A unit is a pattern of neural activation that can occur more or less automatically (it is entrenched). A linguistic unit, such as *cup*, is a **symbolic** unit or pairing of a semantic pole and a phonological pole that is available to speakers without much constructive effort. It is customary to abbreviate the semantic pole in upper case and the phonological pole either in lower case or represent it by means of its phonemic transcription and enclose the units between square brackets, so [[CUP]/[cup]] or [[CUP]/[kʌp]] for *cup*. As CG espouses an encyclopedic view of meaning, the semantic pole of a linguistic expression also includes information that would traditionally be viewed as lying outside the remit of 'semantics' such as the knowledge that, in certain countries, it is customary to offer a hot beverage served in a cup or a mug to someone who pays a visit.[1] Conventional linguistic units are shared by a community of speakers and constitute an inventory which speakers can draw from. This inventory is structured because the units are related to one another in terms, for example, of elaboration and extension: *coffee paper cup* can be viewed as an instantiation or elaboration of more schematic units as in the following hierarchy from more general to more specific: *thing* > *container* > *cup* > *paper cup* > *coffee paper cup*. Instead, the nominal *coffee cup sleeve* is a (metaphorical) extension of the 'piece of clothing' meaning of the noun *sleeve*.

Crucially, linguistic expressions that have unit status are not limited to what are traditionally known as lexemes but may include larger expressions such as opaque idioms like *kick the bucket*, *by and large*, *buy on tick* (an old-fashioned British English equivalent of *buy on credit*), as well as transparent expressions, both complete ones like *I've had enough*, *What's your name? See you later*, and partly filled ones such as *See you at X* (where *X* stands for an arbitrary item, for example a time specification here), *I can't stand the smell of X*, etc. It is plausible to assume that these expressions are available as ready-made units rather than having to be constructed piecemeal every time they are used.

In sum, units can differ in terms of size or **symbolic complexity**. Prototypical lexical items such as *cup* are single words with a fairly specific meaning but units also include more complex expressions such as *What's your name?* Units can differ in terms of **schematicity** as well. Partly filled expressions such as *I can't stand the smell of X* naturally lead us to postulate that a language also comprises more 'abstract' elements such as morphemes and syntactic constructions (traditionally known as 'rules'). The crucial point is that a morphological marker such as the morpheme *-er* in *driver*, *murder*, *writer*, *drinker* is also analyzed as a symbolic assembly in CG: it consists in the pairing of a semantic pole (typically an agent or doer) and a phonological pole whose segmental content ends in /ər/ or /ə/, depending on the variety of English being described. Even more schematic phonologically are class descriptions such as noun and verb, which are however still regarded as inherently meaningful in CG. For example, a noun can be described as [[THING]/[…]], where THING is used technically to refer to any product of our cognitive ability for grouping (see below for more details).

In a similar vein, CG describes 'rules' such as *wh*-question formation (e.g., *When did he visit you?*) and inversion (e.g., *Only later did she find out the truth*) as schematic pairings of meaning and form, which, like any other linguistic expressions, are abstracted away from concrete usage events. Grammar and lexicon are convenient labels for capturing differences in the schematicity and complexity of symbolic assemblies but do not constitute two independent 'modules' in CG; in fact, their nature, that of being symbolic assemblies, is exactly the same. This also means that CG differs greatly from other constructionist approaches. In CxG, for example, constructions are analyzed as pairings of semantics ('meaning') and syntax ('form') but this is not possible in CG because syntax itself is meaningful, residing in the pairing of a relatively schematic semantic pole and a relatively schematic phonological pole.

3. Cognitive Abilities and Models

3.1 Cognitive Abilities

Although it remains agnostic concerning the existence of a language faculty, CG stresses that language is not independent of general cognition. Various basic cognitive abilities can be shown to bear on language use. Here, I will mention association, categorization, automatization, construal, the reference-point ability, and fictivity. (Others such as reification will be touched upon in the sections below.) Although it is convenient heuristically to treat them separately, they are not to be thought of as being necessarily independent of each other.

The very nature of linguistic expressions as symbolic assemblies points to our ability for establishing connections, that is our ability for **association**, which here resides in the linking of a phonological pole with a semantic pole. Association is pervasive and can of course obtain not only within a linguistic expression but also between linguistic expressions. A case in point are metonymies such as *The buses are on strike*, where an object, the metonymic source 'buses', is associated with a metonymic target, which is not necessarily easy to pinpoint but could be taken to correspond to the people driving the buses.

Our ability for **categorization** also depends on association. Any usage event (an instance of language use) is apprehended or categorized in relation to the units that make up a language. If someone were to hear the imaginary word *frimp* occurring in the expression *She frimped me the message*, they would tend to categorize it as a potential dative verb and/or to categorize the expression as an instance of the double object construction, which functions as the sanctioning unit for the target of categorization (the expression being heard). As was remarked in the previous section, the overlap between the sanctioning unit(s) and the target of categorization can, at least as a first approximation, be complete (in the case of instantiation) or partial (in the case of extension), although a more likely scenario is that the overlap is more often than not partial.

The unit status of many linguistic expressions shows the relevance of **automatization** or entrenchment to language use. Automatization, which can be linked, among other things, to frequency of use, is of great importance because it can account for the persistence of 'irregular' forms such as the past tenses *ate*, *slept*, or the plural nouns *feet*, *mice*. Their frequent use means that these forms are stored as such in our mind and are thus resistant to 'regularization' as in the hypothetical 'regular' forms **eated*, **sleeped*, **foots*, **mouses* (see Bybee 2010).

The discussion of lexical items in the previous section touched upon our ability to **construe** some situation or **content** in alternate ways. For example, a coffee paper cup can be referred to, less specifically, as a paper cup or even just a cup, so that these three expressions differ in **granularity**. Also, the previous section highlighted the fact that CG adopts an encyclopedic approach to meaning. Nevertheless, we know that certain aspects of the meaning of an expression are more 'central' than others. For example, the use of a glass as a container for drinking from is usually more relevant than its possible use as a weapon. In other words, linguistic content involves the activation of a matrix or set of **domains**, the drinking domain being more central than the weapon domain for 'glass'. More generally, the matrix or set of domains being activated may include basic as well as non-basic domains. Basic domains include, among others, space, time, taste, temperature, smell, pitch, which cannot be reduced any further to other more basic domains. Non-basic domains incorporate basic domains and may also be arranged in order of centrality. The conception of the human body is clearly non-basic as it incorporates space, for example. When dealing with the lexical item *pupil*, though, we can arrange the various relevant domains in hierarchical fashion as in *space* > *human body* > *head* > *face* > *eye* > *pupil*. In CG terminology, the human body domain is said to be the **maximal scope** for *pupil*. This is the full extent of the conceptualizer's viewing frame or scope of awareness, but *pupil* is of course apprehended relatively to a narrower domain, namely the eye, which constitutes the expression's **immediate scope** or **base**, also called the **onstage region**. Within this base, pupil **profiles** a specific substructure, which is the focus of attention. A further example may be useful to illustrate the point. Consider the verb *drink* and the nouns *drinker* and *beer*. CG claims that all three involve the same content, as is shown in Figure 2.1.

The identical content is the relation between two entities or **participants**, a drinker and some liquid substance being consumed, beer in the case at hand. Although the content is the same, the three expressions differ in terms of what they profile. The verb *drink* profiles the very relation between the drinker and beer, as is shown in Figure 2.1a by the heavy contours for the two participants and the heavy line connecting them. Further, the emboldened time (t) line captures the fact that the conceptualizer keeps track of this process through (objective) time. As for the two participants, it must be observed that they differ in status: the drinker is somehow more prominent than the beer because it is the entity from which the process of drinking departs, or 'energy source', whereas the beer is the entity being affected or 'energy sink'. In GC terminology, the drinker is described as the **primary focal entity** or **trajector**, whereas the beer is the **secondary focal entity** or **landmark**. When it comes to the nouns *drinker* and *beer*, the nominal *drinker* has *drink* as its base and profiles the trajector, see Figure 2.1b, whereas the nominal *beer*, which also has *drink* as its base, profiles the landmark, see Figure 2.1c. To reiterate, although the three expressions *drink*, *drinker*, *beer* all

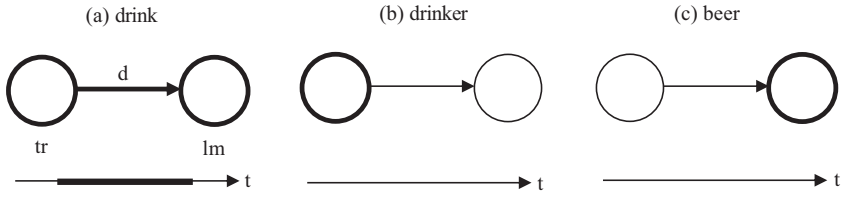


Figure 2.1 Profiling as prominence

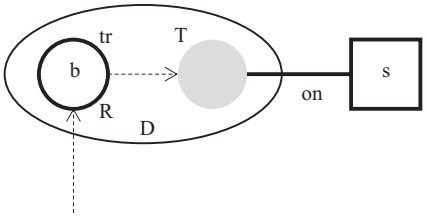


Figure 2.2 The buses are on strike

have the same conceptual base and thus are said to have the same content, they differ with regard to what portions of the base they profile.

It may also happen that expressions have the same content and profile but differ by virtue of **trajector/landmark alignment**. An illustrative example is provided by the so-called subordinating conjunctions *after* and *before*, as in *Tom arrived home after Cathy left vs. Cathy left before Tom arrived home*. Both conjunctions profile a temporal relation between two events but differ as to which of the events is conferred trajector status. With *after*, the trajector is *Tom arrived home*, whereas with *before* the trajector is *Cathy left*.

Another crucial ability, which also involves association, is what Langacker dubs the **reference-point ability** (see, e.g., Langacker 2009: ch, 2). In this non-language-specific ability, the conceptualizer makes contact with a reference point R (see the discussion of Figure 2.2 below for a diagrammatic representation) and uses it as a stepping stone for accessing a target T, which is associated to R by virtue of belonging in the same dominion D as R.

The reference-point ability is rather broad in scope because it can be invoked to account for any kind of association. It applies for example to a memory evoked by a smell and Langacker uses it to describe grammatical phenomena such as the possessive construction (e.g., *Alice's car*, see, e.g., Langacker 2009). It is also relevant to the metonymic case which was mentioned before, *The buses are on strike*, as is shown in Figure 2.2. Here, the reference point R is the trajector of the clause (*the buses*). The reference point R is used to access the target T, shown as a grey circle, which can correspond, for example, to the bus drivers. The preposition *on* profiles a relation between two entities. Although the clause-level trajector is *the buses*, Figure 2.2 makes it clear that the trajector of the preposition *on* is in fact the target T. (The landmark of the preposition is elaborated by the nominal *strike*, shown as the right-hand square.)

Finally, I will discuss an instance of our imaginative capacity, namely **fictivity**. Consider (1).

(1) a. Tom ran along the valley.
    b. This road runs along the valley.

In order to make sense of (1a), we need to track Tom's motion through (conceived or objective) time (see Langacker 2008a: 529). As we do so (through processing time T), we access each location occupied by Tom so that the "conception of a path is […] immanent in the conception of actual motion" (Langacker 2008a: 529). Cases such as (1b) instead do not involve any objective motion; although the motion verb *run* is used, the scene is static. Still, the mental operation of scanning through distinctive locations that build up to a path is also present in (1b), which thus counts as an instance of what Langacker calls fictive motion. In other words, an operation which was linked to an objective scene, the scanning along a path, now takes place independently of the objective scene. This is in fact typical of a wider phenomenon, called **subjectification**. A well-known example is the **grammaticization** of *go*, exemplified in (2). In the original, motion meaning of *go*, see (2a), the conceptualizer scans through time by tracking Alice's motion through space, which is 'onstage' as the focus of attention. When *go* is used as a future marker, see (2b), the subjective

scanning through time, which was immanent in the motion meaning of *go*, is no longer linked to spatial motion but is used to locate events in time. To put it differently, the schematic meaning inherent in spatial motion *go*, namely the scanning through time on the part of the conceptualizer, has been abstracted away from the spatial domain and put to use in a different domain, the temporal domain, to locate events.

(2) a. Alice is going to the supermarket.
b. Alice is going to open the window.

3.2 Cognitive Models

Alongside cognitive abilities, CG invokes various cognitive models or conceptual archetypes which are held to account for linguistic organization. One example is the **stage model** or **baseline viewing arrangement** in Figure 2.3. A usage event involves an 'offstage' region, which includes the ground (the speaker (S), the hearer (H), and their immediate circumstances, comprising their interaction), and an 'onstage' region, which includes what is 'viewed' as the focus of attention, represented as a generic entity by means of the emboldened square in Figure 2.3. The ground thus occurs within a window of maximal scope of awareness (MS), whereas the 'thing' that is 'onstage' as the focus of attention occurs within the window of immediate scope of awareness (IS).

The relevance of the ground is manifest in subjectification, as discussed above, because the scanning along the path in (1b) is carried out by the conceptualizer (S and/or H). Another important example concerns the use of distal determiners such as *this*, as in *Alice likes this skirt*. Although *this* profiles the 'thing' on stage, which is further elaborated by *skirt* in our example, *this* evokes the ground because it implies that the skirt is relatively close to the speaker.

Another model which I alluded to indirectly above is the **billiard-ball model** (Langacker 1991: 13), which describes an agent-patient interaction resulting in the patient's change of place or, more abstractly, state. Building on work such as Goldberg (1995), Broccias (2003) shows that the semantic pole of so-called (transitive) resultative constructions such as *Alice talked her throat hoarse* involves the activation of the billiard-ball model: the process *talk* is construed as a forceful interaction between an energy source (*Alice*), coded as the constructional subject, and an energy sink (*her throat*), coded as the constructional direct object. The construction involves the blending (in the sense of Fauconnier and Turner 2002) of two components, one depicting the process of Alice's talking and the other the process of her throat becoming hoarse. The two components can be integrated thanks to the construal of the process of talking as a force. Obviously, this metaphorical

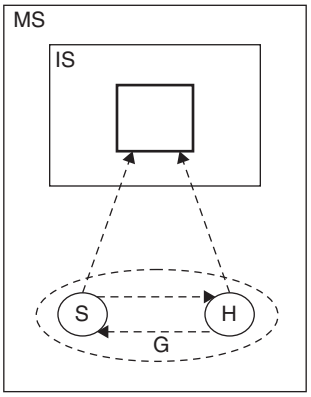


Figure 2.3 The stage model

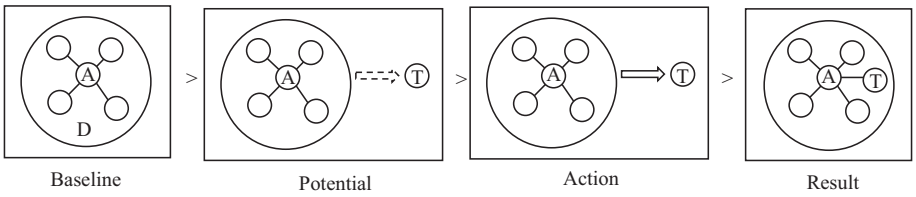


Figure 2.4 The control cycle

construal relies on the interpretation of talking as being so 'excessive' that it can have an impact on the 'state' of Alice's throat.

One more major model postulated in CG is the **control cycle**, which comprises various phases, see Figure 2.4. The baseline has an agent A (broadly construed) at rest within a dominion D which is under its control. In the next phase, a target T appears, which the agent has the potential to bring under its control. If the agent decides to capture the target, the result is the inclusion of the target within the agent's domain. Langacker (2009: 152) observes that, in the case of 'epistemic' control, the verbs *suspect*, *decide*, *know* as in (3) profile different phases of the epistemic control cycle. *Suspect* profiles the potential phase, *decide* the action phase and *know* the result phase.[2]

(3) She {suspected/ decided/ knew} that her husband was unfaithful.

4. Grammatical Classes and Roles

A radical idea entertained in CG is that **grammatical classes** ('parts of speech' or 'word classes') such as noun and verb may be universal and may be defined semantically because schematic characterizations valid for all their members are possible. In fact, CG offers both a prototypical and a schematic characterization for nouns and verbs. The prototype for the noun class involves the conception of a physical object and the protype for the verb class involves the force-dynamic model described in the previous section. Schematically, a noun relies on our ability for grouping and conceptual reification (see Langacker 2008a: 105), i.e., our ability to construe unitary entities at a sufficiently high level of organization, and the verb class involves our ability for apprehending relationships and tracking them through time (i.e., scanning), as the examples in (1) alluded to.

More generally, CG assumes that entities can be divided into **things** and **relation(ship)s**. A **thing**, a technical term in CG, is any product of grouping and reification and is the schematic semantic pole of the noun class. For example, the noun *team* (see Langacker 1987: 197) profiles a set of entities rather than singling out any constitutive member. **Relationships**, by contrast, profile interconnections between entities. Relations can be either **processes** or **non-processual** (or atemporal) **relationships**. A process profiles a relationship made up of various component states (i.e., a complex relationship) scanned **sequentially** through processing time (Langacker 2008a: 111 and 122), as when watching a ball fall in a motion picture. For this reason, a process is said to have a 'positive' temporal profile. Processes constitute the semantic pole of verbs (e.g., *enter*).[3]

Non-processual relationships have a 'null' temporal profile (time is backgrounded) and come in two types: **simplex non-processual** (or stative) **relationships** and **complex non-processual** (or atemporal) **relationships**. Simplex non-processual relations involve a single configuration through time and correspond to the semantic pole of adjectives, stative prepositions (such as *in*, as opposed to the dynamic preposition *into*), and adverbs. Complex non-processual relations (e.g., *into*) are made up of more than one component state over time but such component states are scanned in summary fashion, i.e., the component states are superimposed upon each other so that a single, complex gestalt becomes available (as in a multiple-exposure photo of a ball's fall). Prepositions,

both of the simplex and complex types, differ from adjectives and adverbs in that they involve two, rather than one, focal participants, a trajector (which is an entity, i.e., either a thing or a relationship) and a landmark (which is a thing).[4]

CG also offers a conceptual characterization of **grammatical roles** or **relations**. Their description is not only based on conceptual content but also on prominence (Langacker 2008a: 437). In particular, Cognitive Grammar claims that, as is the case with nouns and verbs, it is possible to define subject and object both prototypically and schematically. A prototypical **subject** is an energy source (e.g., an agent) and, schematically, a subject is a "a nominal that codes the **trajector** of a profiled relationship" (Langacker 2008a: 364). The referent of a subject is therefore a **primary focal relational element**. A prototypical **object** is an energy sink (e.g., a patient) and, schematically, an object is a nominal that codes the **landmark** of a profiled relationship (Langacker 2008a: 364). The referent of an object is therefore a **secondary focal relational element**. If (the referent of) an object is construable as a patient, Langacker uses the term **direct object** to describe it. In other words, Langacker uses the label 'direct object' (and, hence, transitivity) restrictively, to refer to those nominals that allow passivization because passivization is taken to be symptomatic of patient-like construal. Further, the broader notion of 'object' is not only limited to participants. Examples of objects which are not participants are paths (*We hiked a new trail*), locations (*The train approached the station*), and measurements (*It weighs ten kilos*). Similarly, a nominal trajector, i.e., subject, can be a setting or a location rather than a participant, as in *The garden is swarming with bees* and *This book contains a lot of information on linguistics*, where *the garden* is a setting and *this book* is a (metaphorical) location.

5. Constituency and Dynamicity

The second stage in Langacker's CG research, from the turn of the 21st century onwards, has focused on the attempt to offer a unified treatment of structure, discourse, and dynamicity. In particular, Langacker claims that traditional hierarchical constituency of the type represented by trees in generative grammar is neither necessary nor desirable. Nevertheless, in the first phase in the development of CG, it was customary to see the compositional path leading to complex expressions or assemblies of symbolic structures represented in a way similar to a traditional tree. An example is provided in Figure 2.5 for the sentence *Alice likes this red dress*.

At the lowest level of this compositional path, the adjective *red* combines with the noun *dress*. *Red* profiles a relationship between a thing, represented by the circle in bold, and a property, shown as **r**. The ellipses that appear in the diagram represent bundles of properties that serve to specify the various concepts. The thing in the representation for *red* is the trajector which functions as an e(laboration)-site as it is elaborated or specified in further detail by *dress* (d). The dashed line visualizes the correspondence existing between the two. The composition of *red* and *dress* results in the higher-order nominal *red dress*. Because *red dress* profiles 'dress' and not 'redness', *dress* is described as the profile determinant or **head**, whereas *red* functions as a **modifier** because a salient substructure of *red* is elaborated by the head.

At the next level in the compositional path, the grounding element *this* combines with the nominal *red dress*. At a further level, the verb *likes*, which profiles a relationship between a trajector and a landmark, combines with *this red dress*. *This red dress* elaborates the landmark of *like*. As the assembly *likes this red dress* profiles a process (liking) rather than a thing (the dress), *likes* is the head. *This red dress* elaborates a salient substructure of the head and is, thus, described as a **complement** in CG. It follows that whereas the head is dependent, the complement is autonomous (Langacker 2008a: 203). Finally, *Alice* elaborates the trajector of *likes this red dress* and thus functions as the subject nominal of the overall expression.

Importantly, alternate constituencies are possible. For example, Langacker (2016: 29) points out that a topic construction such as *This dress Alice likes* is not hierarchical but essentially serial.

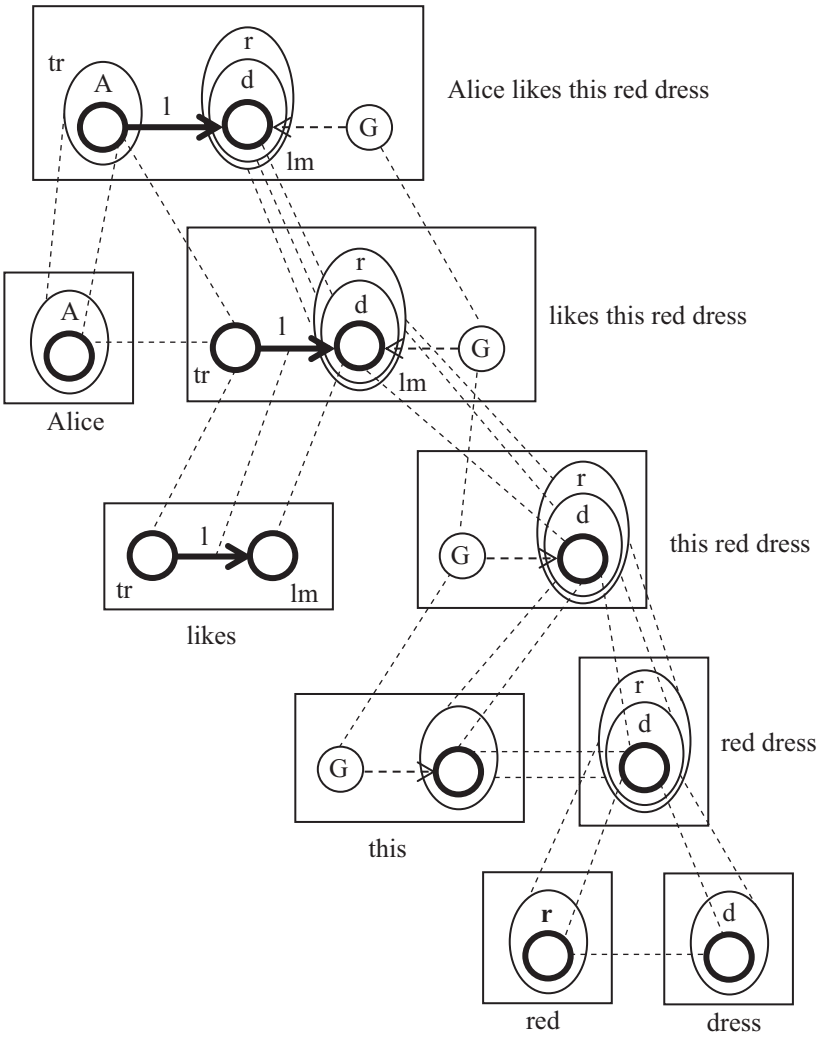


Figure 2.5 A compositional path for *Alice likes this red dress*

Seriality is even more evident when we consider the dynamicity intrinsic to language. Langacker does so by using the notion of **window of attention** or processing window (see also Chafe 1994), which basically corresponds to a prosodic window. For example, the assembly *Alice likes cats* can be taken to segment into *// Alice / likes cats //* as is shown in Figure 2.6a, where boxes of the same size correspond to windows of the same duration and level of processing. Thus, the largest window corresponds to the intonation unit, whereas the subject and the predicate occur in shorter prosodic windows of roughly the same duration. In this instance, the prosodic groupings coincide with 'traditional' hierarchical constituency (subject + predicate). In other words, **discursive organization** (see Langacker 2015), as evidenced by prosodic groupings, and **descriptive organization**, which pertains to grammar in the traditional sense, coincide. This is not necessarily so. Consider, for example, the variant *//Alice / likes / cats//*, where subject, verb, and object each occur in processing windows of roughly the same duration. In this case, see Figure 2.6b, there is no intermediate 'constituent' *likes cats* so that the grammatical organization is 'flat'. However, the distinction between Figure 2.6a and Figure 2.6b may be a matter of degree in that the composite conception *likes cats*

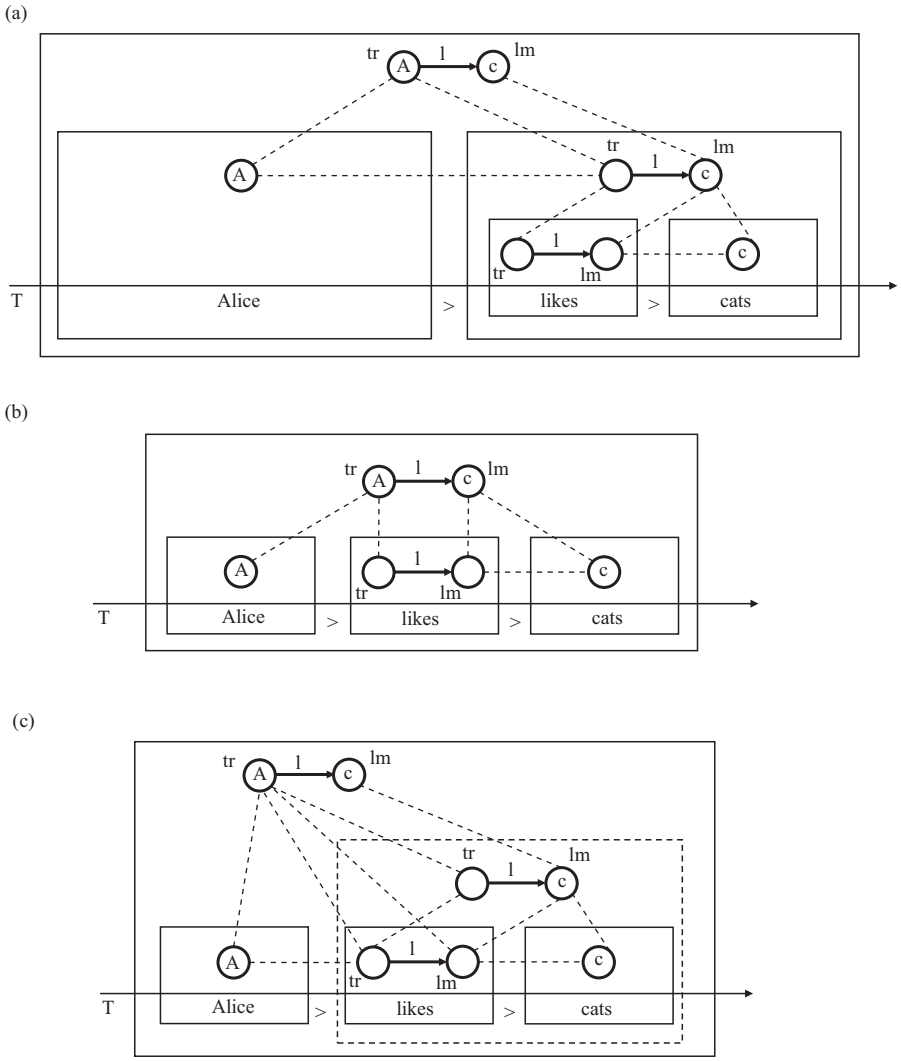


Figure 2.6 Processing and constituency

can emerge at some level of processing, as is shown in Figure 2.6c by means of the dashed box. Crucially, this composite conception may not be symbolized by any prosodic grouping; hence, it does not amount to a grammatical constituent as traditionally conceived.

Discursive organization is also crucial to the analysis of subordination (see, e.g., Langacker 2014). The complex sentence in (4) is usually assigned the constituency in (4a) whereas prosody suggests the groupings in (4b).

(4) a. [Amy says [Bob thinks[Chris believes[Doris left]]]].
b. // Amy says// Bob thinks// Chris believes// Doris left//.

Langacker points out that the bracketing in (4a) does not necessarily reflect grammatical constituency but, rather, conceptual layering. As is suggested by (4b), clausal organization may in fact be serial rather than hierarchical. The clauses are integrated by means of correspondences,

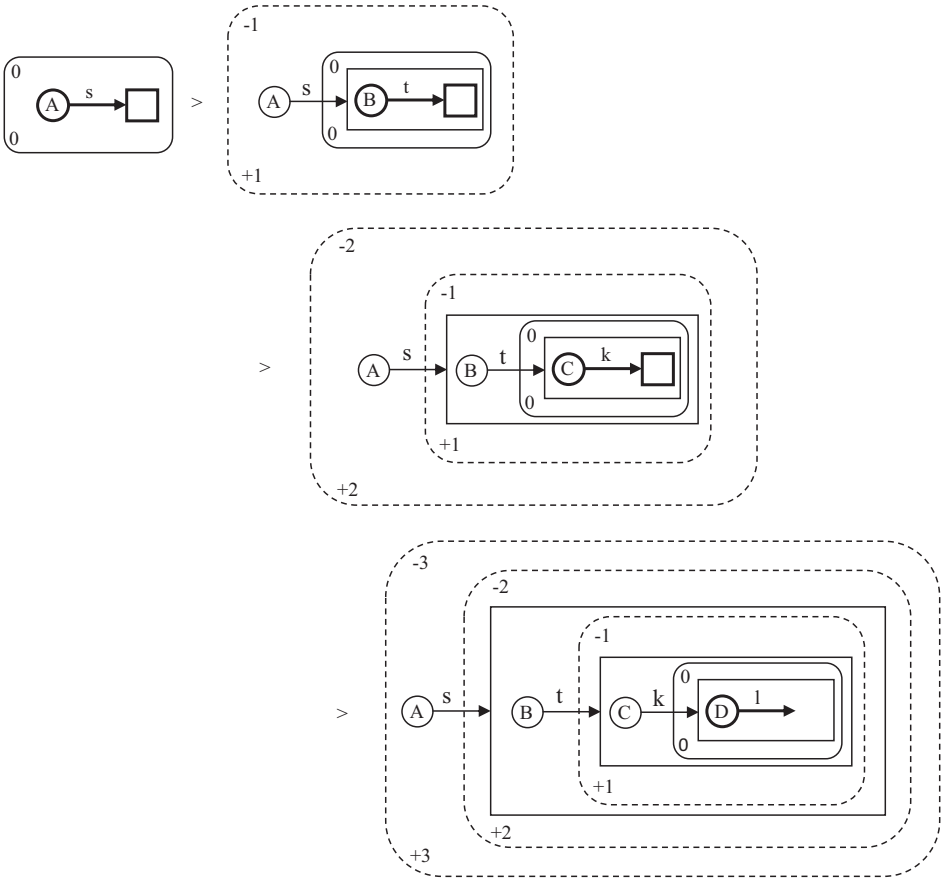


Figure 2.7 Timescales in *Amy says Bob thinks Chris knows Doris left*

thanks to the conceptual overlap between the landmark of a process (*says*, *thinks*, *believes*) and the trajector of the next (*Bob*, *Chris*, *Doris*). In this sense, each clause is 'subordinate' to the previous one because it is accessed through it. The containment relation represented by the constituency in (4a) is still present but is now conceptual rather than grammatical. Each clause is accessed in a basic level window and then recedes in the background, as is shown in Figure 2.7, after Langacker (2014: fig. 21). (The negative numbers in the upper left-hand corners indicate the receding of previous windows of attention whereas the positive ones in the lower left-hand corners stand for progressively larger timescales.)

6. Future Directions

In a recent interview (see Pinheiro 2018), Langacker points out that a basic goal within CG is that of achieving a "unified treatment of seemingly very different phenomena" (Pinheiro 2018: 46). Over the last two decades, as was pointed out above, his major efforts have been directed at achieving a unified treatment of structure, processing, and discourse. Alongside this standing commitment, he also reveals that one of his future objectives is that of offering "a more systematic presentation of the conceptual foundations of semantic structure" (Pinheiro 2018: 46). Indeed, as the debate on the nature of summary and sequential scanning reveals (see Broccias and Hollmann 2007, Langacker 2008b), some central notions such as time and relationship deserve further clarification. Also,

processing should be investigated in more depth so as to distinguish between processing on the part of the speaker and processing on the part of the hearer. Finally, as Langacker himself admits, various phenomena he has dealt with should be studied in much more detail.

Notes

1 Notations like [[CUP]/[cup]] may suggest a clear delimitation and independence of the semantic and phonological poles. However, this is just a convenient fiction (see Langacker 2016).
2 The control cycle underpins our conception of reality and is thus also appealed to in the CG description of modals (see e.g., Langacker 2008a and Langacker 2009).
3 CG used to analyze all relationships as involving a trajector and a landmark but trajector and landmark are now defined in terms of focal prominence (see also section 6). Thus, we may have relationships with only a trajector. This is the case of *arrive*, where the location attained is not considered a focal element and hence a landmark (see Langacker 2008a: 71–72 and 113).
4 Scanning is used to distinguish between for example the verb *enter* and the dynamic preposition *into*. The two are held to have the same content but *enter*, like any verb, is regarded as a relationship scanned sequentially whereas *into* is said to profile a relationship scanned summarily (see Broccias and Hollmann 2007, Langacker 2008b). Summary scanning is also postulated to be operative in *to*-infinitives (e.g., *to enter*), present participles (e.g., *entering*), and past participles (e.g., *entered* in *have entered*).

Further Reading

Langacker, R. W. (2008a). *Cognitive Grammar: A basic introduction*. New York: Oxford University Press. (This is the most updated and comprehensive introduction to Cognitive Grammar available, although, as the title suggests, the phenomena exemplified are not treated in great depth.)

Langacker, R. W. (2009). *Investigations in Cognitive Grammar*. Berlin: Mouton de Gruyter. (A collection of papers that discusses some of the topics in Langacker 2008 in much more detail.)

Langacker, R. W. (2014). Subordination in a dynamic account of grammar. In L. Visapää, J. Kalliokoski & H. Sorva (Eds.), *Contexts of subordination: Cognitive, typological and discourse perspectives* (pp. 17–72). Amsterdam: John Benjamins. (A comprehensive investigation of subordination that integrates grammar and discourse.)

Langacker, R. W. (2016). Toward an integrated view of structure, processing, and discourse. In G. Drodżdż (Ed.), *Studies in lexicogrammar: Theory and applications* (pp. 23–53). Amsterdam: John Benjamins. (An attempt at unifying asymmetries observable in language as manifestations of the notions of baseline and elaboration, the former of which has not been discussed in this chapter for reasons of space. Similar to Langacker 2014 but more general in scope. It should be read before Langacker 2014.)

Related Topics

cognitive semantics; construction grammar and frame semantics; multimodal construction grammar: from multimodal constructs to multimodal constructions; natural semantic metalanguage; word grammar; categorization; construal

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3

CONSTRUCTION GRAMMAR AND FRAME SEMANTICS

Hans C. Boas

1. Introduction

This chapter provides an overview of Construction Grammar (CxG), a theory of language that was developed as an alternative approach to generative transformational grammar at the University of California, Berkeley during the 1980s and 1990s. One of the main goals of CxG is to account for the entirety of language instead of focusing on only specific phenomena thought to belong to a so-called "core" (as opposed to a so-called "periphery"). On the constructional view, a language consists of a very large inventory of form-meaning pairings (constructions), which are organized in a structured network. In this view, the entirety of language consists of constructions (form-meaning pairings). Research in CxG is not only interested in investigating structural aspects of language, but it also seeks to determine how form and meaning, typically modeled in terms of semantic frames, are related to each other. Thus, this chapter also provides an overview of the sister theory of CxG, Frame Semantics, as well as its practical application in terms of the FrameNet lexicographic database.

2. Historical Perspectives

2.1 From Case Grammar to Frame Semantics

The intellectual roots of CxG and Frame Semantics (FS) lie in Charles Fillmore's (1968) seminal paper "The case for case", in which he proposed a limited set of so-called universal deep cases such as Agentive, Instrumental, and Objective (also known as semantic roles), which specify a verb's semantic valency. These deep cases, which are supposed to determine the syntactic distribution of a verb's arguments, were defined independently of verb meanings, they were regarded as unanalyzable, and each syntactic argument should bear only one semantic role. Fillmore's deep cases can be seen as an early version of what later became known as semantic roles, which play a crucial role in representing verb meaning in lexical entries of verbs that interact with constructions (see, e.g., Fillmore & Kay 1993; Goldberg 1995; Croft 2012; Sag 2012).[1]

The years following the publication of Fillmore (1968) saw a growing interest in deep cases (for an overview see Somers 1987; Klotz 2000; Fillmore 2003; Ziem 2008; Boas & Dux 2017). However, during the 1970s, several researchers pointed out problems with the idea of a limited set

of deep cases, for example, (1) that there are no systematic tests for determining their status, (2) the grain size of deep cases (or semantic roles as they became known during the 1970s), and (3) the fact that there is a lack of one-to-one correspondence between deep cases and syntactic arguments (see Levin & Rappaport-Hovav 2005 for an overview). Chapin (1972) summarizes his critique of Fillmore's (1968) case roles as follows:

> [I]t is essential that the inventory of cases be not just finite but quite small in number related to the number of predicates in the vocabulary of a single language (…). Furthermore, it is essential that the cases postulated be precisely defined so as to force correct descriptive decisions. A case system which permits the postulation of a new case to handle every problematic instance is not a theory of substantive universals, but a notational system for ad hoc description.
>
> *Chapin 1972: 651*

These problems led Fillmore during the 1970s to re-conceptualize his view of semantic roles. More specifically, Fillmore moved away from the idea that semantic roles had to be universal and relatively limited in number. Instead, Fillmore developed the view that semantic roles are situation-specific, or, in his words, that "meaning is relativized to scenes" (Fillmore 1977a: 59). This thinking led Fillmore to a series of publications (1977a, 1977b, 1978, 1979) in which he studied various examples of how cultural and world knowledge motivates and is embedded in linguistic expressions. One of the key proposals of Fillmore's new theory of Frame Semantics (1982, 1985a) was that one should define situation types in their own right by identifying the participants (semantic roles), which define the situations. This was in stark contrast to his earlier proposals, in which verb meanings (or the situations they describe) were defined in terms of the semantic roles of their arguments. Thus, to understand the meaning of a word requires a great deal of underlying knowledge as the following quote from Fillmore (2006) illustrates.

> [W]ords represent categorizations of experience, and each of these categories is underlain by a motivating situation occurring against a background of knowledge and experience. With respect to word meanings, frame semantic research can be thought of as the effort to understand what reason a speech community might have found for creating the category represented by the word, and to explain a word's meaning by presenting and clarifying that reason.
>
> *Fillmore 2006: 373–374*

During the 1980s, Fillmore and his associates in Berkeley continued with the development of Frame Semantics (FS) in various ways by working out further details of the theory, but also by applying Frame Semantics to languages other than English and to lexicographic and grammatical questions.

Before turning to an overview of CxG and how it grew out of Fillmore's earlier research of the 1960s, we will turn to a discussion of the practical implementation of FS within the Berkeley FrameNet project. This is for two reasons. First, research on FS in the early 1980s and its subsequent practical implementation in FrameNet proceeded in parallel to that of systematic research on CxG starting in the 1980s. Second, the meaning side of many constructions is typically represented in terms of semantic frames, and FrameNet offers a rich repository of semantic frames. Whereas most research in CxG typically emphasizes form over meaning, this contribution takes an alternative view of constructions by first discussing the meaning side of constructions (see also Boas 2010b, who argues that a comparative and contrastive approach to constructions in multiple languages should begin from the meaning and not the form side of constructions). Third, CxG grew more or less directly out of Fillmore's research in FS as the following quote from Fillmore suggests:

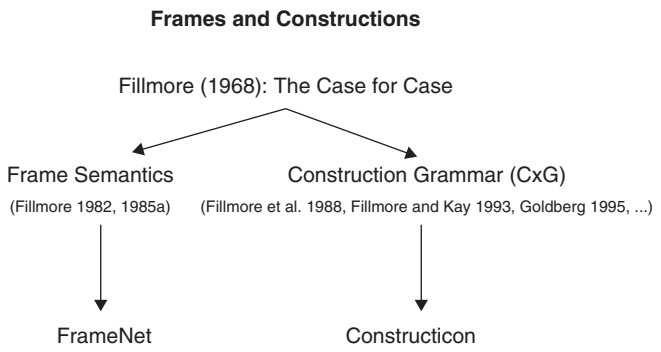


Figure 3.1 Relationship between Frame Semantics, FrameNet, Construction Grammar, and Constructicon

> If new-style lexical entries for content words were to be seen instead as constructions capable of occupying particular higher-phrase positions in sentences and included both the needed semantic role and the needed specifications of structural requirements (…), we could see such structures as providing expansions of their existing categories.
>
> *Fillmore 1985b: 84*

Figure 3.1 illustrates how both FS and CxG grew out of Fillmore's (1968) paper 'The case for case" and how subsequently FrameNet grew out of research in FS and the Constructicon (a repository of constructions) grew out of research in CxG. In the following subsection we first discuss FrameNet, then we turn to CxG.

2.2 From Frame Semantics to FrameNet

This subsection deals with a specific implementation of FS in terms of a lexicographic database of English structured on the basis of semantic frames.[2] As such, FrameNet can be regarded as an applied version of FS in which researchers apply frame-semantic insights in order to build a lexicographic database and to learn more about how the lexicon of English is structured. Insights from this research, in turn, typically inform the broader theory of FS more generally and they also inform frame-semantic analyses of phenomena in languages other than English (see, e.g., the contributions in Boas 2009). I have chosen FrameNet to illustrate most of the basic ideas behind FS because it contains thousands of lexical entries of English verbs, nouns, adjectives, and prepositions, together with the semantic frames they evoke. In addition, a good deal of frames in FrameNet lend themselves for the representation of the meaning side of constructions, which we will discuss in Sections 2.3, 4, and 5 below.

In 1997, Fillmore founded the FrameNet project at the International Computer Science Institute in Berkeley, California. FrameNet (http://framenet.icsi.berkeley.edu) is an online lexical database that documents a broad variety of frame-semantic and corresponding valency information for English words. The information contained in FrameNet is the result of a workflow consisting of various steps, see Boas (2017a). Users can search FrameNet online by typing in a word such as *to certify* which evokes the VERIFICATION frame (as in the example sentence in Figure 3.2, *This note confirms my suspicions*). Clicking on the name of a frame such as VERIFICATION presents the user with a definition of the frame as in Figure 3.2.[3]

One of the main concepts of FS (Fillmore 1982, 1985b) is the semantic frame, which systematically characterizes the different types of knowledge that language users have about the meanings of words. Within FN, semantic frames serve to organize the lexicon of English by grouping together all the senses of words that evoke the same semantic frame (see below for relations between

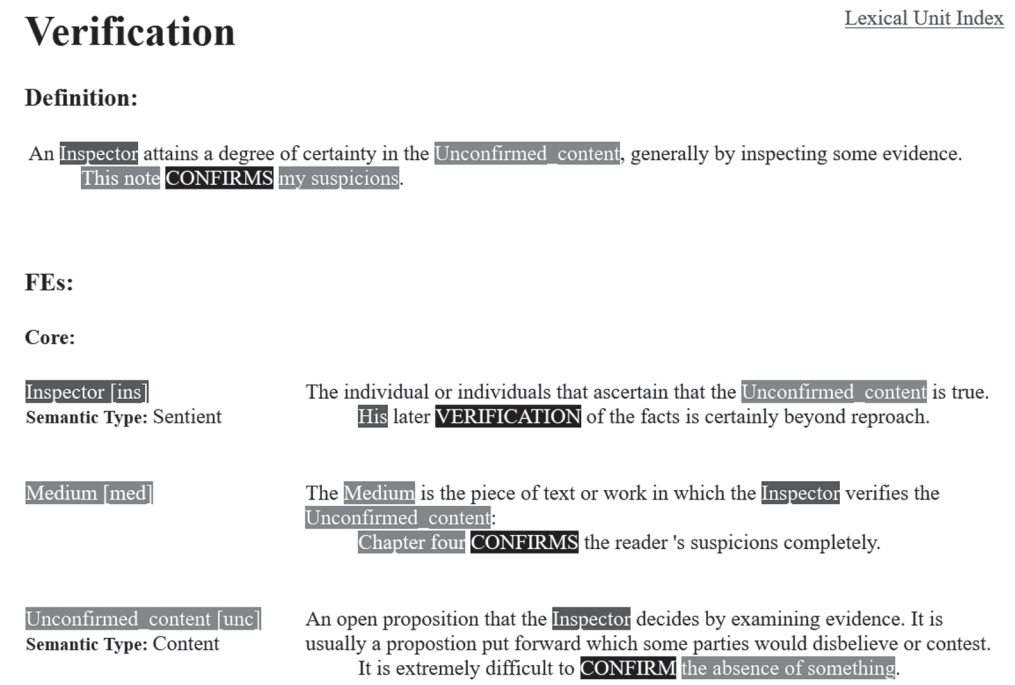


Figure 3.2 Frame and frame element definitions of the VERIFICATION frame in FrameNet

frames). The semantic frames in FN are the result of a complex workflow in which different groups of lexicographers collaborate to use corpus data to define frames, annotate corpus data, and write lexical entries (see section 5 for details).

Looking at Figure 3.2, we see that the definition of the VERIFICATION frame begins with a prose description of the frame, including its Frame Elements (FEs), highlighted in different shades, together with an example sentence. The definitions of the core FEs of the VERIFICATION frame, Inspector, Medium, and Unconfirmed content, appear below the prose description and the example sentence.[4] The FE Inspector is defined as "The individual or individuals that ascertain that the Unconfirmed content is true". The FE Medium is defined as "The Medium is the piece of text or work in which the Inspector verifies the Unconfirmed_content". The FE Unconfirmed content is defined as "An open proposition that the Inspector decides by examining evidence. It is usually a proposition put forward which some parties would disbelieve or contest."[5]

Following the frame description and definition of the FEs, users can access information about frame-to-frame relations in order to get a better understanding of how a specific frame is related to other frames in the frame hierarchy. Here, users can learn that the VERIFICATION frame inherits from the SCRUTINY frame and that it also uses the CORRECTNESS frame. The relationship between these frames can also be accessed by using the Framegrapher, a visualization tool within FN that displays frame-to-frame relations. Figure 3.3 shows how the VERIFICATION frame is related to the SCRUTINY and CORRECTNESS frames.

Frames are related to other frames in the FN frame hierarchy through a variety of frame-to-frame relations, including Subframe, Inheritance, Uses, Perspective on, and Precedes. For more details on frame-to-frame relations, see Petruck et al. (2004) and Ruppenhofer et al. (2016). As we will see in section 5 below, constructions can also be organized in hierarchical networks similar to the frame hierarchy, which will be shown to be relevant for the organization of databases with entries for constructions, also known as constructicons.

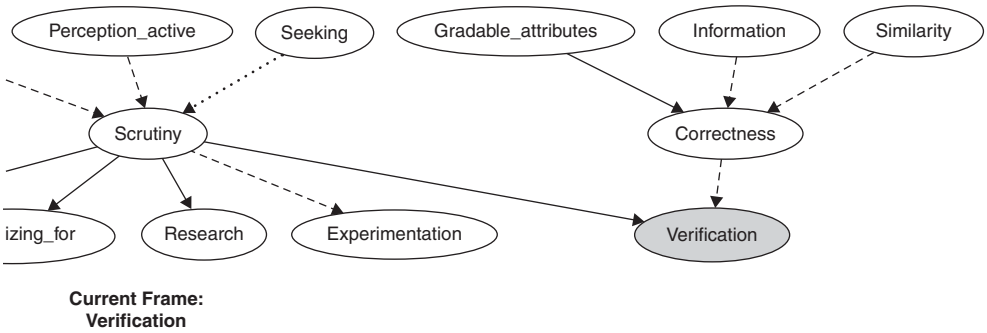


Figure 3.3 Relations between the VERIFICATION frame and the SCRUTINY and the CORRECTNESS frames

Following information about frame-to-frame relations, the VERIFICATION frame entry lists the different lexical units (LUs) that evoke it, including the verbs *to certify*, *to confirm*, and *to substantiate*, the nouns *verification* and *confirmation*, and the adjectives *unconfirmed* and *verifiable*. LUs are specific senses of words or multi-word expressions that evoke a specific frame (FN takes a splitting approach to word meanings, see Fillmore & Atkins 2000; Boas 2013a, 2017a). At this point, users can click on specific links for each LU in order to get to their lexical entry reports or their annotation reports (annotated corpus data which form the basis of the lexical entries).

For example, clicking on the lexical entry report for the verb *to confirm* displays a definition of the verb ("to verify the truth or correctness of something"), followed by a list of FEs and their various types of syntactic realizations in terms of phrase types and grammatical functions.[6] Perhaps the most interesting section of a lexical entry in FN is the detailed listing of an LU's valence patterns as in Figure 3.4, which shows how the semantics of the VERIFICATION frame are realized syntactically in various configurations of FEs (the valence patterns are the result of manually annotated corpus sentences, see section 5 below). Each line with combinations of FEs in Figure 3.4 is known as a frame element configuration (FEC). For example, the first line in Figure 3.4 lists the FEC Condition, Inspector, and Unconfirmed_content as in the sentence [$_{\text{<Inspector>}}$The University] will confirm^{tgt} [$_{\text{<UC>}}$receipt] [$_{\text{[<Condition>}}$on request of the Registry]. Below the combination of FEs in the FEC we find the specification of phrase types and grammatical functions: The FE Inspector is realized syntactically as an external NP, the FE Unconfirmed_content is realized as an object NP, and the FE Condition is realized as a dependent PP headed by the preposition *on*.[7]

The valence information contained in FN lexical entries is extremely useful for a number of reasons. First, the valence tables provide detailed information about how the semantics of an FEC can be realized in different ways syntactically. For example, whereas the first FEC (Condition, Inspector, Unconfirmed content) in Figure 3.4 only allows for one combinatory realization of FEs at the syntactic level, the second FEC (Inspector, Time, Unconfirmed content) allows for three different syntactic realizations of the same FEC. This type of information is useful when investigating whether and how particular types of semantic information are realized syntactically in some configurations, but not in others (see Boas 2003, 2010b; Dux 2016; Boas & Dux 2017, for more details).

Second, it allows researchers to compare how different LUs evoking the same frame realize the semantics of the frame differently. For example, a comparison of the FN valence tables of *to confirm* and *to verify* shows that while *to confirm* has a total of only four FECs (with a total of nine syntactic configurations), *to verify* has a total of 11 FECs (with a total of 22 syntactic configurations). This information is useful for researchers interested in determining how LUs evoking the same

Valence Patterns:

These frame elements occur in the following syntactic patterns:

Number Annotated	Patterns		
1 TOTAL	Condition	Inspector	Unconfirmed_content
(1)	PP[on] Dep	NP Ext	NP Obj
3 TOTAL	Inspector	Time	Unconfirmed_content
(1)	CNI --	AVP Dep	NP Ext
(1)	NP Ext	PP[in] Dep	NP Obj
(1)	NP Ext	PP[in] Dep	Sfin Dep
5 TOTAL	Inspector	Unconfirmed_content	
(2)	CNI --	NP Ext	
(1)	NP Ext	NP Obj	
(1)	NP Ext	Sfin Dep	
(1)	PP[by] Dep	NP Ext	

Figure 3.4 Valence patterns of the verbal LU *to confirm* in the VERIFICATION frame in FN

frame differ from each other in terms of what perspectives they offer on the scenario encoded in the semantic frame. Comparing how the number and types of FECs in the valence tables for *to confirm* and *to verify* differ from each other, for example, leads to the realization that *to verify* can be used in a much broader variety of contexts representing different viewpoints of the scenario encoded by the VERIFICATION frame than is the case with *to confirm*. This type of information is useful as a basis for research on viewpoint and perspective taking (Langacker 1987).

Third, the information contained in the valence patterns in FN lexical entries can be regarded as constructions in the sense of CxG, that is, a pairing of form with meaning/function. Boas (2003) coined the term mini-constructions for such low-level lexical constructions and in subsequent research has shown, based on insights by Croft (2003) and Iwata (2008), how these mini-constructions can be part of a larger constructional network with higher levels of abstraction and generalization (see Boas (2010b/2011b) for more details).[8]

Since 2003, several research teams have been developing FrameNets for other languages, including Spanish, German, Japanese, Swedish, Brazilian Portuguese, French, Korean, and Chinese (see contributions in Boas 2009 and Lyngfelt et al. 2018). The projects differ somewhat in the tools and methods used to create FrameNets for other languages and the degree to which they "recycle" English FrameNet frames (see Boas et al. 2019 for a discussion), but they all share the same goal(s), namely to create lexical databases for languages other than English. More recently, these multilingual FrameNet efforts have led to an international consortium known as Global FrameNet, a collaborative effort to develop frame-based language resources and applications for multiple languages (see www.globalframenet.org/ for more details).[9]

2.3 From Case Grammar and Frame Semantics to Construction Grammar

CxG evolved during the 1980s out of Fillmore's earlier research on Case Grammar and the ongoing research on Frame Semantics in Berkeley by Fillmore and his associates. One of the main goals of CxG was to develop an alternative theory of language in contrast to the prevalent reductionist view of syntax and semantics during the 1980s (Chomsky 1981/1989).[10] To this end, Fillmore and his associates aimed to develop a theory that should not only provide an account of the fully regular syntactic structures in language, but also idiomatic and semi-idiomatic syntactic structures.

One of the first case studies of laying the groundwork for the alternative theory, which was later coined CxG, was Fillmore et al.'s (1988) paper on the *let alone* construction in English. Fillmore et al. (1988) propose that a theory of language should not only be able to account for highly regular syntactic structures in language, but that it should also use the same approach in order to provide insights into structures that are not completely regular. To this end, Fillmore et al. (1988: 501) suggest to focus on the traditional concept of grammatical constructions: "The overarching claim is that the proper units of grammar are more similar to the notion of construction in traditional and pedagogical grammars than to that of rule in most versions of generative grammar." In this view, constructions should not be treated differently from words, because they, too, are forms with specific meanings and functions.

The *let alone* construction (e.g., *Kim doesn't like shrimp let alone squid*) is interesting, because it is idiomatic, yet at the same time highly productive, and it specifies "not only syntactic, but also lexical, semantic, and pragmatic information" (Fillmore et al. 1988: 501). As such, the *let alone* construction exhibits aspects of both regular syntactic structures and idiomatic aspects that set it apart from other coordinating conjunctions which are not "fully predictable from independently known properties of its lexical makeup and its grammatical structure" (Fillmore et al. 1988: 511).[11] The pragmatic meaning associated with the *let alone* construction "allows the speaker to simultaneously address a previously posed proposition, and to redirect the addressee to a new proposition which will be more informative" (Fillmore et al. 1988: 513). Fillmore et al. (1988) argue that generative transformational approaches have issues with dealing with idiomatic constructions such as *let alone*, because they regard mechanisms for pragmatic interpretation of syntactic structures as separate from their syntactic-semantic rule pairs. In contrast, CxG makes the relationship between form and meaning/function explicit by stating that the basic unit of language is constructions (pairings of form with meaning/function) and that language consists of a large network of constructions at various levels of abstraction and schematicity (see section 3 below for details).

Fillmore et al.'s seminal (1988) paper can be regarded as one of the foundational constructional papers articulating the basic concepts of CxG (see also Fillmore 1985a/1988 and Lakoff 1987). Even though it focuses on only one specific construction, the detailed case study of the *let alone* construction shows that it is possible to aim for a comprehensive coverage of all linguistic phenomena (instead of only focusing on the so-called "core", cf. Chomsky 1981) using a common framework built on the notion of construction as the basic unit of language. In this view, constructions are conventional pairings of form and meaning/function at varying levels of abstraction and complexity that must be learned.[12]

The years following the publication of Fillmore et al. (1988) saw a few other papers articulating the new evolving constructional framework, each focusing on a case study of a specific type of construction (e.g., Fillmore 1988/1989; Zwicky 1994/1995). Goldberg's (1995) monograph was the first major book publication solely devoted to CxG, more specifically a particular type of CxG that later became known as Cognitive Construction Grammar (see Boas 2013b). Goldberg's (1995) book is important because it spelled out, for the first time, in a book-length format the various concepts and ideas underlying CxG, including her definition of a construction.[13]

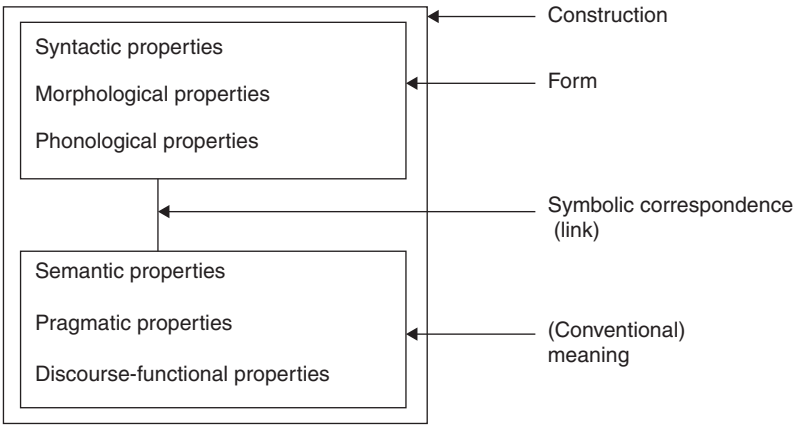


Figure 3.5 Types of information in constructions
Source: Croft 2001: 18.

> C is a CONSTRUCTION iff$_{def}$ C is a form-meaning pair <F_i, S_i> such that some aspect of F_i or some aspect of S_i is not strictly predictable from C's component parts or from other previously established constructions.
>
> *Goldberg 1995: 4*

Goldberg's definition of construction reflects the basic idea of CxG, namely that all of language consists of constructions. This idea, in turn, is the foundation of most other concepts in CxG, including the lexicon-syntax continuum, the organization of constructions in terms of a network, the reliance on usage-based data, and the commitment to analyze all aspects of a language instead of focusing only on selected aspects while ignoring other aspects. Section 3 below takes up these issues in more detail.

The concept of construction in CxG as a pairing of form with meaning goes back to Saussure's (1916) notion of linguistic sign (Goldberg 1995: 4). This means, for example, that form and meaning/function are always tied together and cannot be separated from each other. Note that on this view, form does not only mean syntactic form, but it also includes other aspects such as morphological and phonological information. Similarly, meaning is not just limited to semantic properties, but it also includes pragmatic and discourse-functional properties.

Given Goldberg's (1995) definition of construction and the intimate relation between form and meaning, it is implied that a difference in form also indicates a difference in meaning. In other words, when trying to identify, describe, and determine the status of a construction and how it might differ from other types of constructions, constructionists pay special attention to the question of whether a difference in form also implies a difference in meaning (and vice versa). Figure 3.5 illustrates how form and meaning are related to each other in a construction.

3. Critical Issues and Topics[14]

3.1 The Lexicon-Syntax Continuum

One of the central topics of Goldberg (1995) is the question of how and why certain verbs can occur in specific types of rather unusual patterns. Consider, for example, sentences such as *Bernie coughed the paper off the table* (caused-motion construction), *Christian talked himself blue in the face* (resultative construction), *Claire elbowed her way through the crowd* (*way* construction), and

Lena baked Sophia a cake (ditransitive construction). Prior research in other frameworks proposed, among other things, different rules or mechanisms that would take the lexical entry of a verb such as intransitive *to cough* and turn it into a new lexical entry that could then license novel patterns such as *Bernie coughed the paper off the table*. According to Goldberg, however, such an approach would lead to a proliferation of additional verb senses, which would enlarge the lexicon unnecessarily.

To solve this problem, Goldberg (1995) proposes abstract meaningful Argument Structure Constructions (ASCs), which, given the right conditions, can fuse with lexical entries of verbs in order to provide them with additional constructional roles that then in turn are realized syntactically.[15] For example, Goldberg (1995) suggests that there is an independent resultative construction which has a patient and a result argument that can be added to a verb's semantics when the construction fuses with the verb to yield sentences such as *He talked himself blue in the face* (Goldberg 1995: 189). The lexical entry of the intransitive verb to talk contains frame-semantic information about the semantic role (talk < **talker** >).[16] Goldberg proposes that the resultative construction, whose semantics consists of three semantic roles (agent, patient, result goal), which are encoded syntactically by a [NP V NP PP/AP] frame, adds the patient and result arguments to *talk* to yield a resultative semantics of *to talk* as in (talk < **talker patient** result-goal >). Recognizing the existence of meaningful constructions has the advantage of avoiding the problem of positing implausible verb senses, as Goldberg points out. Moreover, it is possible to "avoid the claim that the syntax and semantics of the clause is projected exclusively from the specifications of the main verb" (Goldberg 1995: 224).

Following Fillmore et al. (1988) and Fillmore and Kay (1993), Goldberg (1995) proposes a view of the relationship between the lexicon and syntax (and of language more generally) that is quite different from that of the prevalent generative-transformational view of the 1980s and 1990s. Whereas formal theories of grammar, such as Government and Binding (Chomsky 1981), propose a strict separation of modules such as lexicon, syntax, and phonology, with rules and mechanisms deriving syntactic structures through a series of different operations (transformations, movement, etc.), Goldberg argues that this separation into distinct modules does not hold up to empirical evidence. As earlier work by Fillmore et al. (1988) shows, certain idiomatic constructions such as the *let alone* construction cannot be analyzed in a strictly modular fashion, because the specific semantic, pragmatic, and syntactic constraints on the realization of syntactic arguments would have to be part of a very extensive lexical entry.[17]

This means that in CxG, there is no strict separation between modules such as the lexicon and syntax, but instead there is a continuum of grammatical constructions that differ in their complexity and level of schematicity/abstraction.[18] These constructions are basically the same type of declaratively represented data structure that pairs form with meaning (see Goldberg 1995: 7). As Goldberg (2006: 18) puts it: "it's constructions all the way down".

Table 3.1 presents an overview of a variety of different constructions at different levels of size, complexity, and abstraction. At the bottom of the table we find the very specific types of constructions which are located at the lexical end of the syntax-lexicon continuum such as words and morphemes. In the middle we find more complex and abstract types of constructions such as the ditransitive and the covariational conditional, whereas at the very top we find highly abstract and schematic types of constructions such as the subject-predicate agreement construction.

Note that Table 3.1 only displays the form side of the constructions but it does not provide information about their meaning/function side. The meaning of most words and some morphemes can be represented in terms of semantic frames. For example, *pizza* evokes the INGESTION frame whereas *to walk* evokes the SELF MOTION frame. Other more abstract constructions such as the ditransitive construction evoke the GIVING frame and the *way* construction evokes the SELF MOTION frame. Whether all constructions have meaning is a matter of debate (see Fillmore (1999) and Goldberg (2006) on the meaning of the subject auxiliary inversion construction), and whether

Table 3.1 Constructions at various levels of size and abstraction (cf. Goldberg 2006)[19]

Subject-predicate agreement	NP VP-*s* (e.g., *Kim walks*)
Imperative	VP! (e.g., *Go home!*, *Buy that book!*)
Passive	Subj AUX V_{PP} (PP_{by}) (e.g., *The chocolate was eaten by the neighbors*)
Ditransitive	e.g., Subj V Obj_1 Obj_2 (e.g., *Lena baked Sophia a pizza*)
Covariational conditional	e.g., The Xer the Yer (e.g., *the more you run the fitter you get*)
Idiom (partially filled)	e.g., *Pat doesn't like cake, let alone brownies*
Idiom (filled)	e.g., *hit the road*, *a penny for your thoughts*
Complex word (partially filled)	e.g., [N-s] (for regular plurals)
word	e.g., *pizza*, *to walk*, *icy*, *but*
morpheme	e.g., *un-*, *-able*, *-ment*

the meaning side of all types of constructions can be represented using semantic frames is still an open question (see Boas et al. 2019).

3.2 Developing and Going beyond English ASCs

The first phase of constructional research of the late 1980s and early 1990s primarily focused on specific idiomatic constructions and a few ASCs in English.[20] But in the decade following Goldberg (1995), what I call the second phase of research in CxG, constructional research was extended in various ways. First, research on English ASCs intensified, resulting in publications such as Israel (1996) on the *way* construction, Jackendoff (1997) on *twistin the night away*, Goldberg (2001) on patient arguments of causative verbs, Boas (2003a/2005c) and Goldberg and Jackendoff (2004) on the resultative construction, Boas (2003b), Iwata (2005), and Nemoto (2005), on the locative alternation, and Kay (2005) on the architecture of ASCs more generally.

Second, research on English constructions in the decade following Goldberg (1995) extended beyond ASCs, focusing on other types of constructions as well. These include Michaelis and Lambrecht (1996a) on exclamative constructions, Michaelis and Lambrecht (1996b) on nominal extraposition, Fillmore (1999) on the subject auxiliary inversion construction, Kay and Fillmore (1999) on the WXDY construction, Kay (2002) on subjectless tagged sentences, Boas (2004) on *wanna*-contraction, and Goldberg (2006) on the subject auxiliary inversion construction (among other constructions).

Third, in the decade following Goldberg (1995), constructional research extended beyond English to include other languages, such as Czech (Fried 2004), Finnish (Leino 2005), French (Lambrecht 2004; Lambrecht & Lemoine 2005), German (Hens 1996; Michaelis & Ruppenhofer 2001; Boas 2002a), Icelandic (Barðdal 1999), and Japanese (Fujii 2004; Ohara 1996; Tsujimura 2005). In subsequent years, the number and variety of constructional research on languages other than English has grown even more.[21]

Fourth, the late 1990s and early 2000s saw an interesting development that led to the emergence of different flavors of CxG. Whereas the original research on CxG, growing out of Fillmore's earlier work on deep cases, evolved into what is now known as Berkeley Construction Grammar (Fillmore 2013), Goldberg's (1995) type of CxG, which was heavily influenced by the work of George Lakoff, became known as Cognitive Construction Grammar (Boas 2013b). Another strand of CxG emerging in the early 2000s is Croft's (2001) Radical Construction Grammar, an approach that also takes typological aspects of language into consideration (see Croft 2013). Similarly, Bergen and Chang (2005) propose Embodied Construction Grammar, a specific flavor of CxG that is employed, among other things, for simulation-based language understanding. Each of the different strands of CxG comes with its own objectives and particular interests motivating the linguistic issues addressed and the methodological requirements for approaching them appropriately (see Boas & Ziem 2018b: 20). However, at the same time, all flavors of CxG share a basic set of

concepts: constructions are the basic building blocks of language, they are pairings of form with meaning/function, they are organized in structured networks, there is no strict division between the lexicon and grammar, they follow a usage-based methodology, and there are no different levels of representation as in other formal theories. See section 5 below for a further discussion of the similarities and differences between the various strands of CxG.

Fifth, various researchers applied Goldberg's (1995) proposals to broader data sets and different types of ASCs. Of particular interest here is the interaction between verbs and constructions. Boas (2003a) is the first corpus-based investigation of the resultative construction based on extensive data extracted from the British National Corpus (BNC). He shows that Goldberg's (1995) characterization of the interactions between lexical entries and grammatical constructions faces some of the same difficulties as the interactions between lexical entries and transformational rules in the Chomskyan framework. Based on a fine-grained analysis of more than 6,000 sentences from the BNC, Boas employs the concepts of collocational restrictions, frequency, analogy, and productivity to encode different types of semantic, pragmatic, and syntactic information (Boas 2003a/2008a).

These types of information are specified in terms of so-called mini-constructions, which represent specific senses of verbs, which allows Boas to account for a given utterance from a comprehension perspective as well as a production perspective. On this view, some of Goldberg's independently existing abstract meaningful ASCs such as the resultative and caused-motion constructions are an epiphenomenon caused by the great number and frequency of specific verbs occurring with resultatives. In contrast, the mini-constructions in Boas (2003a) allow researchers to provide an exact account about the contexts in which resultatives may be licensed and when they are ruled out (for the role of coercion see Michaelis 2005 and Boas 2011a).[22] This includes collocational restrictions on the resultative phrase (cf. *They shot him dead / to death*).

In this view, most resultatives are conventionalized and directly licensed in terms of mini-constructions. Non-conventionalized resultatives, in contrast, are licensed through analogical extension of already existing conventionalized mini-constructions. Thus, a sentence such as *Tom sneezed the napkin off the table* is licensed because the meaning of *to sneeze* is analogically extended based on the close association with *to blow*, whose mini-construction already conventionally combines the specific form with the specific resultative/caused-motion meaning/function.[23]

Other researchers also seek to delimit the power of Goldberg's ASCs, because it is not always clear how the fusion of verbal semantics and constructional semantics can be constrained in order to rule out unattested sentences. For example, Croft (2003) makes a principled distinction between verb-class and verb-specific construction in order to arrive at a more accurate account of the types of verbs capable of occurring in the ditransitive construction. Similarly, van der Leek (2000), Iwata (2005), and Nemoto (2005) show that Goldberg-type ASCs are not capable of delimiting the range of verbs that occur in the locative alternation (see Sankoff 1983; Levin 1993; Iwata 2008). Instead, they shift the focus of analysis to the lexical level where specific lexical constructions (similar to Boas's mini-constructions) serve to license the locative alternation.

3.3 Families and Networks: ASCs and Other Constructions

One of the central assumptions of CxG is the idea that language consists of a network of constructions (pairings of form with meaning/function). This idea goes back to research in Cognitive Grammar, in which constructions are described by families of constructional schemas characterized at varying levels of specificity (Langacker 2000: 31).[24] Langacker (2000: 34) proposes at least two different types of networks, namely a constructional network and a lexical network, both of which are organized in terms of different levels of schematicity and specificity. Figure 3.6 shows on the right side how the verb *to send* is conventionally associated with different types of subschemas, including [[send] [NP] [NP]], which in turn also belongs to a network of constructional schemas describing its grammatical behavior.

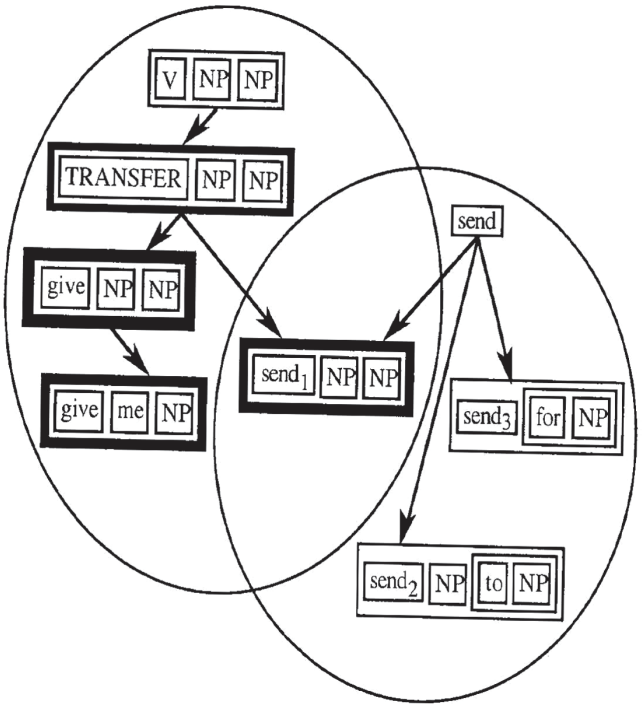


Figure 3.6 Constructional and lexical networks
Source Langacker 2000: 34

The idea that constructions that share certain aspects of their form and/or their meaning/function with other constructions form some type of families of constructions that are best represented in constructional networks re-occurs in a great deal of constructional research. Goldberg (1995), for example, proposes extensions from the central sense of the ditransitive construction, forming a radial set model in which each subconstruction is related to and directly derived from the core sense, which is defined as the actual successful transfer of a material entity between a volitional Agent and a (willing) Recipient (Goldberg 1995: 151). Each of Goldberg's six extensions from the ditransitive construction's central sense (including metaphorical extensions) is related to the central sense in terms of inter-constructional polysemy links. As such, the ditransitive construction and its related subconstruction form a family of constructions whose relations are captured in terms of a constructional network.[25]

One of the central questions surrounding constructional families and their representations in terms of networks is how these networks are organized and structured, and how specific networks are related to other networks. For example, whereas Goldberg (1995) proposes a core sense and six sense extensions to cover the various realizations of ditransitives, Kay (2005) argues that only three monosemous subconstructions are necessary to account for the ditransitive.[26] Colleman and De Clerck (2008) show that Kay's (2005) proposal is problematic because it does not cover all verbs occurring in the ditransitive, including *envy* and *forgive*. This leads Colleman and De Clerck (2008: 190) to argue for a multidimensional analysis that identifies conceptual links between different senses of the ditransitive construction and the verbs occurring in it. On this view, the polysemy of the ditransitive construction is due to co-occurring semantic shifts along various dimensions. Each of these semantic shifts corresponds to the components of the prototype, thereby forming the basis for the various sense extensions.[27]

With respect to a different ASC, the resultative construction, Boas (2011b) proposes to combine the results of different accounts in order to arrive at a network representation of different

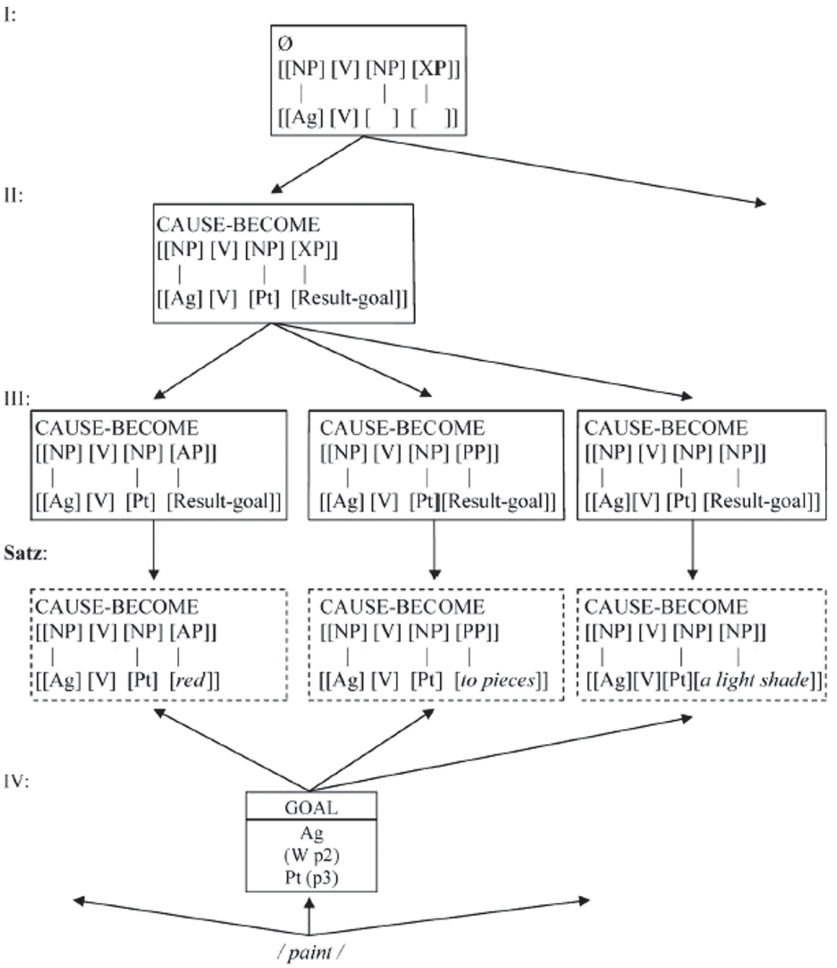


Figure 3.7 Constructional network of resultative construction with various levels of abstraction
Source: Boas 2011b: 58.

resultatives. This network analysis builds on Goldberg's (1995) account, which suggests that resultatives are independently existing meaningful abstract constructions that are capable of fusing with lexical entries of verbs. Taking Goldberg's (1995) proposals and combining them with Boas' (2003a) account of resultatives in terms of mini-constructions leads Boas (2011b) to develop a network of resultative constructions with different levels of abstraction and specificity, as in Figure 3.7, which contains four distinct levels of abstraction.[28]

At the very top of Figure 3.7 we find an abstract construction at Level I that combines the syntactic specifications [[NP] [V] [NP] [XP]] with a non-descript semantics specifying only the Agent role of a verb. This abstract construction is inherited by different types of less abstract constructions, including the resultative at Level II in Figure 3.7, which pairs the syntactic specifications [[NP] [V] [NP] [XP]] with resultative semantics (as in Goldberg 1995). At Level III in Figure 3.7, the abstract resultative semantics is specified in greater detail in terms of the different syntactic configurations needed to realize the resultative (i.e., whether the resultative phrase is realized as an NP, AP, or PP). These more concrete resultative constructions, together with the mini-constructions at Level IV at the bottom of Figure 3.7 representing individual specifications of verb senses (with respect

to their syntactic, semantic, and pragmatic restrictions), form the basis of fully specified resultative sentences at the sentence ("Satz") level in between Levels III and IV.[29] This network analysis of the resultative has the advantage that it combines the strengths of both Goldberg's (1995) and Boas's (2003a) accounts of the resultative.

Constructional networks have not only been posited for ASCs, but also for other types of constructions at different levels of schematicity, from rather abstract to very specific types of constructions. These include, among many others, passives (Ackerman & Webelhuth 1998; Lasch 2016), conatives (Medina 2017), subject-auxiliary inversion (Fillmore 1999; Goldberg 2006), support verb constructions (Zeschel 2008), meso-constructions (Domínguez Vázquez 2015), datives (De Knop & Mollica 2017), *search*-constructions (Proost 2017), XPCOMP constructions (Gonzálvez-García 2017), relative clause constructions (Diessel 2019), and the V-*that* construction (Perek & Patten 2019).[30]

This brief overview of how (families of) constructions can be organized in terms of networks has shown that almost all research in this area is focused on specific types of constructions. In other words, more and more researchers are describing and analyzing more constructions to find out, among other things, how they are organized in networks. Whereas this effort is in the spirit of usage-based linguistics, there are so far no overarching proposals about how these different types of networks are related to each other or how one can account for the entirety of a language with one overarching network of constructions.[31]

One major step towards achieving this goal is presented by Diessel (2019), who combines insights from different approaches towards developing networks of constructions. He proposes a dynamic network model of grammar in which all aspects of linguistic structure, including core concepts of syntax (e.g., phrase structure, word classes, grammatical relations), are analyzed in terms of associative connections between different types of linguistic elements. There are two major types of relations in Diessel's grammar network. The first characterize signs as networks in terms of symbolic relations (associations between form and meaning), sequential relations (associations between linguistic elements in sequence), and taxonomic relations (associations between representations at different levels of specificity). The second characterize networks of signs and include lexical relations (associations between lexemes), constructional relations (associations between constructions), and filler-slot relations (associations between particular items and slots of constructions). In Diessel's model, both constructions and lexemes are analyzed as nodes of a symbolic network and each node in the network is also analyzed as some kind of network. See section 4.3 below for a further discussion of how the concept of network has been applied to the compilation of a so-called constructicon, a structured inventory of construction entries parallel to lexical entries of the type found in FrameNet.

3.4 Productivity of Constructions

Constructions differ a great deal in how productive they are, which partially depends on what types of restrictions they impose on their open slots.[32] For example, whereas the resultative construction is very restrictive and appears to place so many constraints on the postverbal constituents that it is probably more accurate to state those restrictions at the level of low-level mini-constructions (cf. Boas 2003a), other ASCs such as the ditransitive construction impose fewer restrictions on their slots (see Goldberg 1995: 143–150; Goldberg 2006b: 412–418). Other ASCs impose even fewer restrictions on their open slots, such as the *way* construction (Goldberg 1995; Israel 1996), whose only restrictions include that the verb occurring in it designate a repeated action or unbounded activity, that the motion must be self-propelled, and that the motion must be directed (Goldberg 1995: 212–214).[33] Other, more schematic constructions such as passive and relative clause constructions impose even fewer restrictions on their open slots. The productivity of constructions

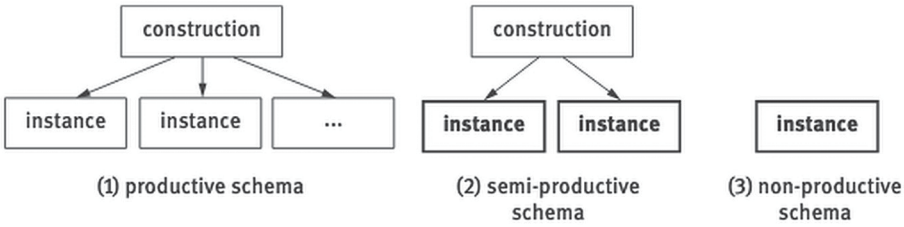


Figure 3.8 Constructional productivity
Source: Based on Clausner & Croft 1997: 271.

is thus organized on a continuum, ranging from fully productive constructions to semi- and non-productive constructions (Goldberg 2006; Barðdal 2008; Boas & Ziem 2018b).

The types and amounts of restrictions imposed by constructions, together with how abstract and schematic a construction is, have a direct influence on a construction's productivity (Bybee 1985; Goldberg 1995; Dąbrowska 2008). Hoffmann (2013: 315), following research by Barðdal (2008, 2011), among others, summarizes the status of productivity as follows:

> [t]he productivity of abstract constructions can be seen as an inverse correlation of type frequency and semantic coherence, with highly abstract macro-constructions only arising if the underlying meso-constructions have a high type of frequency and a high degree of variance in semantic distribution.

Type frequency is important, because it has been shown to strengthen the representation of a constructional schema in memory, which in turn determines the availability of that schema for categorizing novel items. When ASCs are associated with a large number of verb types they tend to be more easily extensible to new items than ASCs that are only associated with a few verb types (see Goldberg 2006; Barðdal 2008; Diessel 2019). In contrast, token frequency typically restricts the extension of constructional schemas to new items, thereby also affecting the productivity of constructions. For example, Bybee (1985/1988) demonstrates that linguistic expressions with high token frequency are deeply entrenched in memory and thus typically resist the influence of analogical change. This is known as the "preserving effect" of high token frequency (see also Bybee (2010: 66–73) and Diessel (2019: 131–132)).

The role of type and token frequency with respect to the productivity of constructions is illustrated by Clausner and Croft (1997) as in Figure 3.8. On the left side of Figure 3.8 we see a construction in a productive schema, which is entrenched, together with a set of different instances instantiating the construction. In the middle of Figure 3.8 we find a semi-productive schema, where only a limited set of instances instantiate the construction (token entrenchment). On the right side in Figure 3.8 we see a non-productive schema (with a single token entrenched) where there is only one instance of a particular token and no productive schema in which a construction may instantiate more than just one instance.

4. Current Contributions and Research

4.1 Different Flavors of CxG

The first phase of research on CxG coming out of UC Berkeley from the mid-1980s to the mid-1990s was primarily concerned with analyzing, from a synchronic point of view, semi-idiomatic constructions and ASCs, as well as a few more abstract types of constructions.[34] This led to two related and compatible constructionist approaches that came to be known as Berkeley Construction

Grammar (Fillmore & Kay 1993; Kay & Fillmore 1999; Fillmore 2013) and Cognitive Construction Grammar (Goldberg 1995/2006; Boas 2013b). Whereas both constructionist approaches agree on a basic set of core concepts, e.g., that the architecture of language is non-modular and non-derivational, and that constructions are learned on the basis of input, there are a number of differences that set Berkeley Construction Grammar (BCG) apart from Cognitive Construction Grammar (CCxG).

One difference is the status and role of motivation and frequency in language. CCxG, like other research in Cognitive Linguistics (see Broccias 2013), aims to offer a psychologically plausible account of language by determining how various general cognitive principles serve to structure the inventories of constructions (Boas 2013b). On this view, constructions are assumed to be motivated by more general properties of cognition and interaction. Frequency also plays a central role in CCxG, leading to the idea that even fully regular patterns may be stored alongside abstract schematic constructions when they occur with sufficient frequency (Goldberg 2006: 45–65). In contrast, BCG, whereas not denying the role of motivation and frequency in language, does not explicitly employ these concepts to develop constructional analyses. Instead, BCG aims to find maximal generalizations without redundancies, typically employing strict inheritance in its constructional networks. For differences and similarities in how CCxG and BCG analyze the same phenomena, see Fillmore (1999) and Goldberg (2006) on the English subject-auxiliary inversion construction.

Another difference between different flavors of CxG concerns the role played by notation and formalization. Whereas Radical Construction Grammar (Croft 2001/2013) does not use any formal notation, CCxG uses a simple box notation to represent the form and meaning side of ASCs, together with an open slot in which lexical entries represented by a minimal frame-semantic representation (e.g., verb: <agent, patient>) can fuse. The lack of detailed formalization in CCxG is motivated by the wish to represent linguistic knowledge in such a way that it can interface transparently with theories of processing, acquisition, and historical change (Goldberg 2006: 215). BCG, as well as its close relative, Sign-Based Construction Grammar (SBCG) (Boas & Sag 2012; Sag 2012; Michaelis 2013), is more focused on detailed unification-based formalisms using Attribute-Value Matrices (AVMs) to represent constructions. Even though the different approaches to formalizing linguistic insights might be bewildering at first sight, there is an advantage as Boas and Fried (2005) point out:

> This apparent lack of superficial uniformity might seem frustrating to the outsider, especially to one who is used to the representational discipline of generative syntax. However, many construction grammarians actually see the relative freedom in the formalism as a reflection of the fundamental tenet of the model, which is that linguistic analysis should not be an exercise in accommodating predetermined formal structures consisting of predetermined abstract variables, but, rather, an enterprise in extracting relevant structures and categories from the data patterns at hand (argued for convincingly and formulated most succinctly in Croft 2001).
>
> *Boas & Fried 2005: 3*

A third major difference between the various flavors of CxG concerns the application of the theory. As already pointed out, CCxG is particularly keen on developing a psychologically plausible account of language, whereas BCG and SBCG are more concerned with strict formalizations. Radical Construction Grammar comes out of Croft's research on linguistic typology and is interested, among many other things, in determining typological differences and similarities between linguistic phenomena in different languages. On Croft's view, each language should be described and analyzed using only its own categories instead of re-using categories from other languages. Embodied Construction Grammar (Bergen & Chang 2013) and Fluid Construction Grammar (Steels 2013) have a particular focus on computational simulation and implementation.

4.2 Fields of Inquiry beyond the English Synchronic Syntax-Lexicon Continuum

Most constructional research in the 1980s and 1990s was primarily concerned with providing synchronic accounts of English constructions along the syntax-lexicon continuum. One of the main goals was to develop an alternative theory of language capable of accounting for all aspects of language, not just for a few chosen syntactic phenomena. This focus broadened considerably in the 2000s and beyond, when more and more researchers got interested in applying constructional insights and methodologies to phenomena beyond the synchronic syntax-lexicon continuum, including morphology (Booij 2013), idioms (Croft & Cruse 2004; Wulff 2013), and information structure (Lambrecht 1994; Fried 2003; Leino 2013).

At the same time, there has been a growing interest in applying constructionist insights to a range of different linguistic sub-disciplines. One such field is first language acquisition, in which grammar is regarded as a dynamic system of constructions that is acquired by children based on domain-general learning mechanisms such as automatization, analogy, and entrenchment (Tomasello 2003; Dąbrowska 2004; Diessel 2004). In this usage-based bottom-up view of language acquisition, there is no assumption, as in the Chomskyan framework, that syntax is an autonomous module of language and that syntactic structures are derived from primitive categories. Instead, grammatical development begins with specific formulas that children gradually decompose and, based on processing large amounts of linguistic data, elaborate to more complex and schematic units. The outcome of this learning process is, on the constructionist view, a network of constructions that is immediately grounded in their linguistic experience (e.g., Diessel 2013; Ellis et al. 2016).[35] Closely related is the field of second language acquisition, in which constructionist insights are applied to determine how second language learners acquire constructions and how determinants, such as input frequency, form, and function, influence the acquisition of L2 constructions (e.g., Ellis 2013; Madlener 2015; Behrens & Pfaender 2016; Achard 2018; Wulff et al. 2018). Constructionist insights into the processes underlying second language acquisition have, in turn, influenced research on applied aspects of L2 acquisition, i.e., language pedagogy in the classroom (see the contributions in De Knop & Gilquin 2016; Herbst 2017; and Garibyan et al. 2019).

Historical linguistics is another field applying constructionist insights to understand how languages change over time. One major area of interest is grammaticalization, which "does not merely seize a word or morpheme (…) but the whole construction formed by the syntagmatic relations of the element in question" (Lehmann 1985). Applying the constructionist usage-based methodology to grammaticalization has led to the proposal that constructions are the locus of change and that grammaticalization more generally should be understood in terms of "constructionalization". Of particular interest in this context is the gradual nature of constructionalization, the emergence of functional polysemies, the role of context (semantic and pragmatic triggers of novel interpretations), and, more generally, the motivation for change. For more details, see Bergs & Diewald (2008), Fried (2009/2013), Diewald & Smirnova (2010), Hilpert (2013a, 2013b), Traugott & Trousdale (2013), Barðdal et al. (2015), Sommerer (2018), and Traugott (2019). Constructionist insights have also been applied to historical-comparative reconstruction in order to determine prehistoric stages of languages. Whereas research in this area has traditionally focused on lexical, phonological, and morphological comparisons, constructionists are also interested in syntactic reconstruction (see Barðdal 2013/2015; Vázquez-González et al. 2019).

Constructionist insights have also been applied to investigating the nature of language variation (and its relation to language change). The paradigmatic shift introduced by Weinreich et al. (1968) brought the methods and findings of the study of change in progress to the attention of the broader linguistics community (see Labov 2019; Pierce & Boas 2019). When seen from a constructionist perspective, the introduction of quantitative and structural methods to the study of language variation appears to be very illuminating, because it allows for a more systematic approach

to understanding the variability of constructions, the basic units of language, in different dialects. However, there have so far only been a few case studies investigating how constructionist insights can inform a more general theory of language variation, including Hollmann & Siewerska (2006, 2011) and Mukherjee & Gries (2009). For more details, see Hollmann (2013); Östman & Trousdale (2013); Ziem (2015); and Hilpert (2017).[36]

Closely related to language change and variation is the field of language contact (see Thomason (2019) for an overview). Höder (2014a) proposes Diasystematic Construction Grammar (DCxG), a novel framework for analyzing language contact phenomena by applying insights from CxG. According to Höder, language contact phenomena such as borrowing, code-switching, convergence, etc. should be thought of as resulting from situations in which the linguistic knowledge of multilinguals consists of a common repertoire of elements and structures (i.e., constructions) for all of their languages and varieties. In DCxG, the multilingual repertoire can be regarded as a set of linguistic structures consisting of idiosyncratic subsets on the one hand (containing elements that solely belong to one language or variety) and common subsets on the other (containing elements that are common to several or all languages within the repertoire) (Boas & Höder 2018b). DCxG allows researchers to systematically address a large range of language contact phenomena, i.e., different types of transference phenomena (Clyne 2003) at the lexical, phonological, morphological, syntactic, semantic, and pragmatic levels. For details, see Höder (2012/2014b/2016) and the contributions in Boas & Höder (2018a, 2021).

As noted above, the first phase of research in CxG during the 1980s and 1990s was primarily concerned with analyzing English without making any specific claims about language universals or cross-linguistic generalizations. However, this focus on English did not mean that constructionists were not interested in how their insights could be applied to other languages as the quote from Fillmore and Kay (1993) illustrates:

> We will be satisfied with the technical resources at our disposal, and with our use of them, if they allow us to represent, in a perspicuous way, everything that we consider to be part of the conventions of the grammar of the first language we work with. We will be happy if we find that a framework that seemed to work for the first language we examine also performs well in representing grammatical knowledge in other languages.
>
> *Fillmore & Kay 1993: 4–5*

In fact, the decade following the publication of Goldberg (1995) saw a substantial body of constructionist research on other languages, including Chinese, Cree, Czech, Danish, Finnish, French, German, Icelandic, Japanese, Swedish, and Spanish (for an overview, see Boas 2010b). In the second decade of the 21st century, constructionist research expanded even more, analyzing linguistic phenomena in an even broader variety of languages. It is not clear, however, to what degree constructionist insights (beyond the basic concepts of CxG) could be applied from one language to another language. To this end, Croft (2001) argues that constructions *per se* are language-specific and that linguistic categories in a language are defined in terms of the constructions they occur in. In this view, there are still universals, but these are only "found in semantic structure and in symbolic structure, that is, the mapping between linguistic function and linguistic form" (Croft 2001: 61).

A slightly different view regarding cross-linguistic comparisons and the applications of constructionist insights from one language to another is presented by the papers in Boas (2010a), which offer a contrastive view of constructions. Applying principles from contrastive linguistics (Weigand 1998; Altenberg & Granger 2000) and Frame Semantics (Fillmore 1982; Fontenelle 1997; Fillmore & Atkins 2000; Boas 2002b), these papers focus on comparing and contrasting constructions in only two languages (English with Swedish, Spanish, Japanese, Thai, Finnish, Russian, among others) in order to determine their similarities and differences (see Boas 2020b). Using semantic

frames as a *tertium comparationis*, each of the papers shows that it is indeed possible to compare constructions across languages, thereby arriving at insights about what English constructions and their counterparts in other languages have in common and how they differ. As the following section shows, this contrastive approach to constructionist analysis has subsequently been applied and expanded to systematically document and compare constructions across different languages.

4.3 Constructicography

The idea for a so-called constructicon, a repertory of constructions, grew, among other things, out of Fillmore's decade-long work on FrameNet, which made him realize the limitations of lexical analysis when dealing with a larger range of linguistic phenomena such as multiword expressions, complex idioms, and schematic syntactic patterns conveying rich meaning.[37] Parallel to the work on FrameNet, which can be regarded as an applied implementation of Frame Semantics, Fillmore (2008) proposes to employ the insights from two decades of research on CxG for the creation of a database of English construction entries as an extension to the lexical FrameNet database.

The one-year-long pilot project "Beyond the Core" at the FrameNet project in Berkeley extended the architecture of the FrameNet database and developed a corpus-based workflow similar to that of lexical FrameNet to discover, annotate, and document a broad variety of different types of grammatical constructions, including frame-bearing constructions, valence-augmenting constructions, constructions without meaning, pumping constructions, and exocentric and headless constructions. Parallel to FN-terminology, the components of a construction are labeled construct elements (CEs) with mnemonic labels, and in some cases constructions have a construction evoking element (CEE), similar to frame-evoking target LUs in FN (for details, see Fillmore et al. 2012). For example in a sentence such as [$_{\text{Theme}}$*We*] *sang our way*$^{\text{CEE}}$ [$_{\text{Path}}$*across Europe*], the combination of the verb *to sing* with a possessed *way*-headed NP (the CEE) creates what functions as a multiword verb evoking the MOTION frame. Here, *we* functions as the CE Theme and *across Europe* functions as the CE Path, whereas *our way* is the CEE.

The pilot project resulted in an unstructured list of about 75 construction entries in the extended FN database that all share the same format: a definition of the construction in prose (sometimes

Way_manner
Evokes the Motion frame
Inherits Way_neutral

• A verb exceptionally takes ***one's way*** (the CEE) as a direct object, where ***one's*** is a possessive pronoun coindexed with the external argument of the verb. Together, they indicate that some entity moves while performing the action indicated by the manner verb. The manner verb is either transitive or intransitive, and thus labeled either (Transitive_Manner_Verb or Intransitive_manner_verb). Following ***one's way*** is an obligatory frame element indicating some core aspect of motion (Source, Path, Goal, Direction).

• The semantics of this construction is identical (or at least very close to) that of the frame Motion: A Theme moves under its own power from a Source, in a Direction, along a Path, to a Goal, by a particular means. In many cases the path traversed by the Self_mover is also created by them as they go, in a particular manner (i.e., while performing some temporally coextensive action) (as in ***he whistled his way through the plaza***).

• [the She] [t_man whistled] [cee her way] [Path down the lane] [goal to the sale].

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• Goldberg, Adele E. 1995. *Constructions: A Construction Grammar Approach to Argument Structure.* Chicago: Chicago University Press.

• Kuno, Susumu and Takami Ken-ichi. 2004. *Functional Constraints in Grammar: On the Unergative-Unaccusative Distinction.* Amsterdam: John Benjamins Publishing Company.

Figure 3.9 First part of *Way manner* construction entry
Source: Boas 2017a.

including references to the literature), a list of construction elements (and their definitions), specification of a construction evoking element (if present), the construct's properties, and the evoked frame (if present). A construction entry also contains a list of annotated example sentences as well as a realization table (parallel to the valence table in lexical FN) showing how the various combinations of CEs are realized syntactically (for details, see Boas 2017a; and Lee-Goldman & Petruck 2018).

Applying insights from CxG to the creation of a constructicon consisting of construction entries has become known as constructicography (parallel to lexicography) (see Lyngfelt 2018). At the same time, insights gained from constructicographic research, in turn, informs the mother theory of CxG, because it forces constructionist analyses to go beyond families of constructions into the enterprise of describing a coherent CxG of a language (Boas et al. 2019). The Berkeley Constructicon for English has inspired a number of constructicon projects for other languages, including Swedish, Brazilian Portuguese, Japanese, German, and Russian (see the contributions in Lyngfelt et al. 2018). Whereas the projects for these different languages all share the goal of compiling constructicons for individual languages, they differ in their methodologies, tools, corpora, format of construction descriptions, and integration of FrameNet frames in their construction entries (see Boas 2017a; Lyngfelt 2018; Boas et al. 2019, for a discussion).

5. Main Research Methods

5.1 Usage-Based Methodology

Research in CxG builds on the usage-based conception first proposed by Langacker (1987) and then expanded upon in Langacker (1988). In this view, grammar should be conceptualized as non-reductive, bottom-up, and maximalist in order to recognize a number of general psychological phenomena that are essential to language. This means that language learning involves a great deal of actual learning while minimizing the postulation of innate structures specific to language and that it can thus be viewed as the cognitive organization of one's experience with language (Bybee 2006). This view of grammar is in stark contrast to the assumptions of the Chomskyan framework (Chomsky 1961),[38] which analyzes grammar in a minimalist, reductive, and top-down fashion, and which tries to minimize what a speaker has to learn and mentally represent in acquiring a language ("economy") (see Langacker 2000; and Broccias 2013; as well as the contributions in Barlow and Kemmer 2000).[39]

The usage-based approach to analyzing language has influenced constructional research in a number of ways. The most prominent influence has probably been in the way that constructions are defined. Unlike in Goldberg's (1995) definition of a construction (see section 2.3 above), her latest definition includes the concept of frequency, which is one of the crucial components of a usage-based constructionist approach that "capitalizes on the fact that learners attend to and retain aspects of both the form and interpretation of utterances" (Goldberg 2019: 64).[40]

> Any linguistic pattern is recognized as a construction as long as some aspect of its form or function is not strictly predictable from its component parts or from other constructions recognized to exist. In addition, patterns are stored as constructions even if they are fully predictable as long as they occur with sufficient frequency.[41]
>
> *Goldberg 2006: 5*

On the usage-based view, the role of frequency is crucial because it allows us to capture the concept of entrenchment, which results in increasing familiarity, i.e., the idea that more frequent formulations are more accessible and are thus preferred (see Langacker 2000; Stefanowitsch 2008; Bybee 2010; Ellis 2013). Other important concepts informing a usage-based approach include analogy and similarity, exemplars, and chunking (see Bybee 2010/2013).[42]

5.2 Use of Corpus Data

Much linguistics research up to the 1990s relied primarily on anecdotal and introspective data.[43] Fillmore (1992) proposes to move beyond this methodology by combining linguistic intuitions with corpus linguistics in order to arrive at a more adequate methodology for developing insights into the nature of language. What Fillmore (1992) calls "computer-aided armchair linguistics" roughly describes the workflow of the FN project and its parallel projects for other languages as well as, to some degree, the workflow of the various constructicon projects. In other words, most of the applied research on FrameNets and constructicons for different languages relies on a combination of observational and introspective data. The same can be said for ongoing research in CxG and Frame Semantics more generally.

Building on earlier research by Gilquin and Gries (2009), Gries (2013) discusses a broad variety of different data and methods relevant to research in CxG. These include the following: First, introspective judgments used for early constructionist research in the 1980s and 1990s. Second, observational approaches using different types of corpus data for different languages, modes and registers, varieties, and synchronic, diachronic, and experimental data. These quantitative corpus-based approaches seek to explore, among other things, concepts such as frequencies of (co-)occurrence, conditional probabilities (unidirectional), association strengths (bidirectional), and multifactorial and multivariate approaches. Third, research in CxG also relies on experimental data of different kinds (see Gries 2013: 101–106) as well as computational and machine-learning approaches (see Gries 2013: 106–107).

Employing these different types of data to inform research in CxG is in contrast to the Chomskyan framework, in which researchers continue to aim to capture the competence of an idealized native speaker based primarily on introspective data. Another way in which constructionist research differs fundamentally from the Chomskyan paradigm is in its use of various statistical methods that use empirical data.

5.3 Statistical Methods

The availability of large corpora makes it possible to use a variety of statistical methods in constructionist research. One of the most prominent methods is the so-called collostructional analysis (a blend of collocation and construction), which allows researchers to quantify association strengths between different elements in an utterance (Stefanowitsch 2013; Hilpert 2014). Based on collocational approaches developed in corpus linguistics, the collostructional analysis offers different ways of determining association strengths to arrive at rankings of how much words and particular slots of constructions attract each other: collexeme analysis (Stefanowitsch & Gries 2003), distinctive collexeme analysis (Gries & Stefanowitsch 2004), and co-varying collexeme analysis (Stefanowitsch & Gries 2005). For more details, including the use of inferential statistics, choice of statistics, the applications of collostructional analysis, and other statistical methods, see Stefanowitsch (2013), Perek (2015), Zeschel (2015), Yoon & Gries (2016), Gries (2017/2019), and Engelberg (2018).

6. Future Directions

6.1 Types of Constructions

Early research in CxG during the 1980s and 1990s focused on semi-idiomatic constructions and then on ASCs. Since then, constructionists have expanded their research areas considerably to cover a range of other types of constructions such as passives (Ackerman & Webelhuth 1998; Lasch 2016), relative clauses (Webelhuth 2012), filler-gap constructions (Sag 2010), and many others. However, we still do not know how many (types of) constructions there are in a language, how

these constructions are organized in terms of similar or different networks using different types of inheritance (see Sag et al. 2012), and how the various networks of a language are related to each other in one large network (see Diessel 2019). Closely related to these issues are open questions about language universals, i.e., which properties of constructions could be considered as language universals whereas at the same time excluding other properties? These are questions that need to be answered by future research.

6.2 Interactions of Constructions

Another open question concerns the interaction of constructions. Most research in CxG currently focuses on analyzing specific constructions and their relationship to other constructions. However, it is still not entirely clear how constructions interact with each other in order to license a specific utterance. Recall that CxG does not assume multiple levels of representation, but instead focuses on surface forms ("what you see is what you get"). Thus, it seeks to account for the licensing of utterances by simultaneously recruiting different constructions from a language's constructicon and combining them. To illustrate, consider the following sentence.

(1) The donuts taste yummy.

The intransitive construction licensed by the one-place predicate *to taste* sets out the overall sentence structure, comprising an NP and VP construction, whereby the first is complex in itself such that it consists of a definite pronoun and a noun. Lexical constructions make up the lexical material combined into phrases. Again, lexical constructions may be simple in cases in which the items do not inflect (*the*, *two*, *cold*) or complex (*to taste*, *donut*). The latter instantiate morphological constructions, such as plural constructions (*donuts*) or other inflection constructions specifying number, tense, and mood (*to taste*).

The example in (1) appears to be relatively straightforward, because we are (only) dealing with an intransitive declarative clause in the active voice. But how do constructions interact to license more complicated utterances including different semi-idiomatic constructions, passives, long-distance dependencies, ellipsis, conditionals, raising, and control? To this end, Sag et al. (2012: 5) ask the following questions: "Do constructions freely interact when compatible? Are

Table 3.2 Constructions instantiated by *The donuts taste yummy*

Types of constructions	*Instances*
Intransitive construction $[[X]_{NP}\ [Y]_{V}]$	$[[\textit{The donut}]_{NP}\ [\textit{taste}]_{V}]$
VP construction $[[X]_{V}\ ([Y]_{NP})\ ([Z]_{PP})]$	*taste*
AdvP construction $[[x]_{Adv}\ ([y]_{Adv})]$	*yummy*
NP construction	$[[\textit{the}]_{\text{def-Pr.}}\ [\textit{donut}]_{N}]$
Plural construction $[[X]_{\text{N-root-morph}}\ [\text{-y}]_{\text{infl-morph}}]]$	$[[\text{donut}]_{\text{root-morph}}\ [\text{-s}]_{\text{infl-morph}}]$
Verb-inflection construction $[[X]_{\text{V-root-morph}}\ [Y]_{\text{Infl}}]$	[*taste*] [-Ø]]
Lexical constructions	[*taste*], [*the*], [*donut*], [*yummy*]

some constructions optional? Are some constructions obligatory? How does a grammar guarantee that exactly the 'right' constructions apply to a given context?" These questions are still left largely unanswered and need to be addressed by future research.

6.3 Discovering and Analyzing Constructions and Frames

Another issue is the question of how to systematically identify and analyze constructions in an empirical way. To date there has been very little systematic research on how to empirically determine the full range of constructions in a language, let alone describing these constructions and analyzing how they fit into the larger constructional network of a language. Put differently, research in CxG appears to be led by the types of constructions which researchers are interested in analyzing. In a way, this "discovery procedure" is similar to the workflow of FN, in which lexicographers pick and choose the words, frames, and domains they wish to explore.

One way in which this approach has evolved in FN is to annotate a complete text with all the semantic frames evoked by specific LUs. This corpus-based effort is aimed to show how Frame Semantics can contribute to text understanding and to show how different types of frame-semantic information may overlap in the same sentence (see Fillmore & Baker 2001; and Scheffcyzk et al. 2010).[44] Subsequently, Ziem et al. (2014) show how complete sentences in a running text can be annotated with grammatical constructions and semantic frames. Analyzing a newspaper text, the authors systematically dissect each sentence to determine which grammatical constructions are needed to license each sentence and which frames are evoked by the individual frame-evoking LUs in the text. The results of Ziem et al.'s (2014) analysis demonstrate the complexity of interactions between different constructions licensing a sentence and the semantic frames evoked by the LUs in these sentences.

More recently, Boas (2019) proposes a systematic procedure for discovering and documenting constructions in a corpus in order to build up a constructicon. Inspired by Hanks (2013: 4), who proposes that a "corpus-driven approach (…) will provide methods and benchmarks against which the theoretical speculations in all these approaches to language can be checked, tested, and in some cases improved", Boas (2019) takes Goldberg's (1995: 4) classic definition of a construction as the basis for his full-text approach to systematically discovering and analyzing constructions in a corpus from beginning to end in order to compile construction entries for each construction appearing in the corpus. Figure 3.10 illustrates the workflow underlying the discovery and analysis of each construction.

The procedure begins with the first sentence of the corpus (top right in Figure 3.10) by asking the question how many constructions are needed to license the first sentence. Then, one looks to see if there are any construction entries available in the constructicon (step 2), represented by the box on the left side in Figure 3.10 (step 3). If it is possible to license the sentence based on construction entries that already exist in the constructicon, then no further entries are needed (step 4) and one is done with analyzing that sentence. Then, one moves on to the second sentence and begins again with the first step at the top right in Figure 3.10.

However, if there are no construction entries available to license the sentence, or if combining existing construction entries to license the first sentence does not work, then it becomes necessary to analyze and annotate the corpus sentence in detail in order to arrive at preliminary versions of construction entries needed to license the sentence (step 5) and look for additional corpus sentences that will provide additional examples of the construction(s) under analysis (steps 6 and 7). These additional corpus examples will then be annotated (step 8) and analyzed (step 9), eventually leading to the formulation of a new construction entry that is then added to the constructicon (step 10). Once this procedure is completed, researchers move on to the next sentence in the corpus to follow the same workflow.

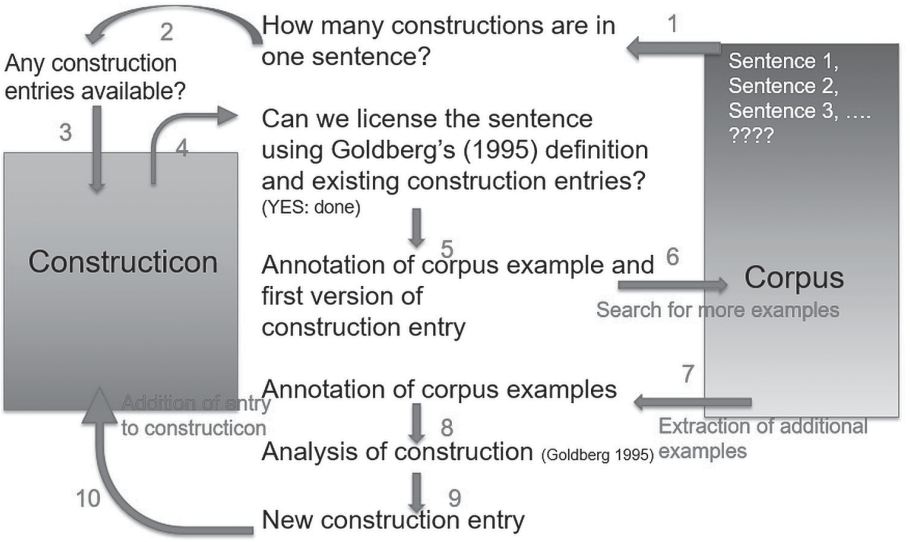


Figure 3.10 Full text analysis of a corpus to determine construction entries needed to license each sentence
Source: Boas 2019: 255.

How the implementation of the procedure outlined in the preceding paragraphs works still remains an open question, especially when applied to a larger corpus. Clearly, this workflow is time intensive and can be sped up in a number of ways. For example, before starting with a full text analysis of an entire corpus one could populate the constructicon with construction entries informed by the results of constructionist research over the past three decades. This would already provide researchers with some building blocks for discovering the relations between constructions in the constructicon and ensure that construction descriptions are compatible with other construction descriptions. At the same time, it could lay the groundwork for developing a first systematic account of a broad variety of constructions, how these constructions interact, and whether all constructions are in fact meaningful, as assumed by many practitioners of CxG.

Notes

1 In other linguistic frameworks dealing with the interaction between meaning and form, semantic roles also play a crucial role in what is known as Linking Theory (see, e.g., Butt et al. 1997; Levin & Rappaport-Hovav 2005; Osswald & Van Valin 2014; Wechsler 2015).
2 Parts of this section are based on Boas & Dux (2017), Boas et al. (2019), and Boas (2020a).
3 Following FrameNet practice, frame labels are in Courier New font and FE labels are in small capital font.
4 FN makes a distinction between so-called core FEs that are crucial for the understanding of the frame itself and non-core FEs that do not define the frame but provide additional information such as Time, Place, and Manner. Other non-core FEs of the VERIFICATION frame include Degree, Explanation, Instrument, Means, and Purpose.
5 https://framenet2.icsi.berkeley.edu/fnReports/data/frameIndex.xml?frame=Verification&banner=
6 https://framenet2.icsi.berkeley.edu/fnReports/data/lu/lu11041.xml?mode=lexentry. Figure 3.4 is in grey-scale. The original lexical entry in FrameNet is in color.
7 FN also documents null instantiated FEs, i.e. FEs that are not overtly realized in a sentence but that are conceptually understood as a part of the frame evoked by the relevant LU. There are three types of null instantiation recognized by FN: DNI (definite null instantiation), INI (indefinite null instantiation), and CNI (constructional null instantiation). For details, see Fillmore (1986), Ruppenhofer & Michaelis (2014), Ruppenhofer et al. (2016), and Boas (2017b).

8 FrameNet data are used for a variety of computational applications, including automatic role labeling (Gildea & Jurafsky 2002; Das et al. 2010), semantic parsing (Baker et al. 2007), and sentiment analysis (Ruppenhofer & Rehbein 2012).
9 See Boas (2020b) on the question of whether semantic frames may be universal (or not).
10 Parts of this section are based on Boas & Ziem (2018a), Boas et al. (2019), and Boas (2020a).
11 See Wulff (2013) and Bybee (2013) for a discussion of idiomaticity in CxG.
12 Note that this view is in contrast to the generative-transformational approach, which proposes that children growing up are not exposed to rich enough data to acquire every feature of their language ("poverty of the stimulus") (Chomsky 1988).
13 For other definitions of constructions see Croft (2001: 17–21) and Fried & Östman (2004: 18–23).
14 Since the early 2000s, more and more researchers have adopted CxG as a linguistic framework. Besides an ever-growing number of publications on CxG, a number of new venues have emerged for presenting constructional research, including the biannual International Conference on Construction Grammar (which started in Berkeley in 2001), the journal *Constructions and Frames* (www.benjamins.com/catalog/cf), the book series Constructional Approaches to Language (www.benjamins.com/catalog/cal), as well as specific theme sessions on CxG at conferences such as the International Conference on Cognitive Linguistics, the Conference of the German Society of Cognitive Linguistics (DGKL), and the Conference of the French Association for Cognitive Linguistics (AFLiCO).
15 When entries of verbs and ASCs fuse with each other, they have to adhere to the *Semantic Coherence Principle.* Only roles which are semantically compatible can be fused. Two roles r_1 and r_2 are semantically compatible if either r_1 can be construed as an instance of r_2, or r_1 can be construed as an instance of r_1. For example, the kicker participant of the *kick* frame may be fused with the agent role of the ditransitive construction because the kicker role can be construed as an instance of the agent role. Whether a role can be construed as an instance of another role is determined by general categorization principles, and the *Correspondence Principle*. (Each participant role that is lexically profiled and expressed must be fused with a profiled argument role of the construction. If a verb has three profiled participant roles, then one of them may be fused with a construction's nonprofiled argument role.) (Goldberg 1995: 50).
16 Semantic roles represented in bold are profiled arguments, i.e. entities in a verb's semantics that are "obligatorily accessed and function as focal points within the scene, achieving a special degree of prominence (Langacker 1987)" (Goldberg 1995: 44).
17 Coercion is an important concept determining which verbs can occur in certain constructions under specific conditions. See Michaelis 2004; Boas 2011a; and Van Trijp 2015.
18 See Boas (2008b), who argues that in Goldberg's (1995) approach there still is a *de facto* separation of the lexicon and syntax, because lexical entries as separate entities fuse with ASCs, which are a different type of data structure.
19 Note that there is some disagreement on whether morphemes are the smallest constructional units. Whereas Goldberg (2006: 5) assigns morphemes the status of constructions, Booij (2010: 15) argues that morphemes should not be assigned constructional status. See Booij (2017) for details.
20 Recall that constructional research started out by focusing on semi-productive idiomatic constructions (while keeping in mind more "regular" constructions, too), i.e. those types of structures that in generative-transformational approaches such as that of Chomsky (1981) were thought of belonging to the co-called "periphery" instead of the so-called "core grammar". In CxG, there is no such systematic differentiation between a "core" and the "periphery", because it is not clear on what empirical grounds such a distinction could be made. See Boas & Ziem (2018b: 14–15) for more details.
21 Note that this section cites only a limited number of relevant publications in the decade following Goldberg (1995). Its purpose is to provide an overview of how CxG evolved out of a relatively small group of researchers at or with links to UC Berkeley during the second phase of constructional research. It is difficult to provide a substantial overview of all the many different phenomena and languages investigated by constructional researchers during what I call the third phase of constructional research in the years since 2005. For an overview of the relevant literature see the contributions in Hoffmann & Trousdale (2013).
22 For an alternative account to Boas (2013a) see Goldberg & Jackendoff (2004) as well as Boas (2005a).
23 This approach also integrates insights from historical linguistics about lexical change. With respect to how new words and patterns occur in language over time and how repeated analogical extensions influence the emergence of new constructions, Hilpert (2013: 471) notes the following: "Repeated analogical extensions may over time lead to the emergence of a general schema (…) which invites further additions to the range of expressions occurring in this now partly schematic idiom."
24 This research in Cognitive Grammar, in turn, has been influenced by earlier research on prototype categorization (Rosch & Mervis 1975).

25 See Boas (2002a) for an alternative proposal suggesting that constructional polysemy is unnecessary for analyzing ASCs, because it appears as if constructional polysemy is an epiphenomenon that replicates lexical polysemy at a more abstract and schematic level.
26 For an earlier proposal, see Fillmore & Kay (1993), who propose an abstract ABC-construction with seven sub-constructions (Recipient, Benefactive-Ditransitive, Caused Motion, Resultative, Immobility, Caused Location, and Fill/Empty), which all inherit from the abstract ABC-construction, thereby forming a constructional network. Croft (2003) notes that there are also autonomous verb-specific constructions of ditransitives, which he claims are independently represented in the mind.
27 See also Boas (2010c) and Colleman & De Clerck (2011) for details on how specific semantic classes of verbs may occur in the ditransitive.
28 See also Goldberg & Jackendoff (2004) and Luzondo (2014) for related proposals.
29 For a similar but more coarse-grained approach, see Traugott (2008), who proposes so-called micro-constructions, meso-constructions, and macro-constructions to account for the different levels of abstraction and specificity of constructions. For an overview of other proposals of how resultative constructions are organized in terms of constructional families, see Peña (2017).
30 For a discussion of the architecture of different types of networks, see Boas (2013b).
31 A related issue is the question of how different constructions (presumably from different sub-networks of the larger network of a language) interact with each other in order to license specific utterances. This is an underexplored area of research. Without going into any details, Goldberg (2019: 49) proposes that "the forms and the functions of constructions that are combined must be compatible. When they are not, the resulting utterances are judged to be unacceptable to varying degrees, depending on the degree of incompatibility." Clearly, this issue needs to be addressed in much greater detail by future research.
32 Parts of this section are based on Boas & Ziem (2018b).
33 Note that the discussion of constructional productivity here focuses primarily on ASCs. Other types of constructions such as partially filled idioms (e.g., *to drive someone {crazy/bonkers/up the wall/dizzy}* (see Boas 2003a; Bybee 2013)), the WXDY construction (Kay & Fillmore 1999), or passive constructions (Ackerman & Webelhuth 1998; Lasch 2016) also exhibit different degrees of productivity.
34 Parts of this section are based on Boas (2013b), Boas (2017), and Boas & Ziem (2018b).
35 For an overview of how constructionist insights have been applied in psycholinguistics and neurolinguistics, see Bencini (2013) and Pulvermüller et al. (2013).
36 CxG has also been applied to the analysis of spoken language, see Auer (2006), Deppermann et al. (2006), Günthner/Imo (2006), Bücker et al. (2015), and Imo (2013).
37 Two decades earlier, Fillmore (1988: 37) proposed the idea for a repertory of constructions as follows: "The grammar of a language can be seen as a repertory of constructions, plus a set of principles which govern the nesting and superimposition of constructions into or upon one another." See Jurafsky (1992: 18), who coins the term "constructicon" in reference to the term "lexicon". See Goldberg (2019: 36) on how the constructicon can be conceptualized in terms of a network of constructions.
38 Chomsky (1961: 130) proposes that "it is absurd to attempt to construct a grammar that describes observed linguistic behavior directly".
39 The usage-based approach attempts to circumvent the rule/list fallacy, which assumes that rules and lists are mutually exclusive. In this view, the grammar may include both rules and instantiating expressions (for more details, see Langacker 2000: 2–3).
40 On the difference between token and type frequency see Bybee (2013: 59–63). For details on frequency effects, see Diessel (2019).
41 Note that the notion of what exactly "sufficient frequency" means is open to interpretation. For example, more recently Goldberg (2019: 64) points out the following: "The semantic, formal, sound, and social dimensions associated with each construction are formed by generalizations across the partially abstracted exemplars that have been witnessed." Clearly, the notion of "sufficient frequency" (and possible rankings of factors from different dimensions) needs to be worked out by further research.
42 Research in Fluid Construction Grammar (FCG) (Steels 2013) and Embodied Construction Grammar (ECG) (Bergen & Chang 2013) has led to computational implementations of constructional insights based on usage-based data. The FCG formalism allows researchers to take constructional insights and formulate them in a precise way that allows for the testing of hypotheses in the context of parsing, production, and learning. ECG captures the cognitive and neural mechanisms that underlie human linguistic behavior computationally. For the differences between FCG and SBCG, see Van Trijp (2013).
43 In psycholinguistics, experimental data also plays an important role. Sampson (2003) argues that the preoccupation with speakers' hazy intuitions about language structures is often sharply at odds with the nature of their actual usage and that such an approach towards developing theories of language is rather unscientific (for a similar view, see Hanks 2013).
44 For details, see https://framenet.icsi.berkeley.edu/fndrupal/fulltextIndex.

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Related Topics

grammaticalization, lexicalization, and constructionalization; multimodal construction grammar: from multimodal constructs to multimodal constructions; diachronic construction grammar

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4

MULTIMODAL CONSTRUCTION GRAMMAR

From Multimodal Constructs to Multimodal Constructions

Thomas Hoffmann

1. Introduction

Whenever we speak face-to-face, we do not just use language, i.e., our conventionalized verbal communication system. We also use our hands, stance, as well as varying facial expressions to communicate the complex semantic, social, as well as emotional meanings we want to express (Steen & Turner 2013). Indeed, our natural drive to communicate multimodally can also be observed when our interlocutor is not physically present: When we talk to people over the phone, we for example use gestures despite the fact that the hearers cannot see us (Cohen 1977; McNeill 2013b: 206). Moreover, when we are consciously aware that our interlocutor cannot see us, as for example when composing text messages, we naturally feel the need to complement our written code with additional material to express information normally encoded by gestures, stance and/or facial expressions (e.g., emojis such as 👈, 👋 or ☺).

Take the phrase *Yeah, right* …, which out of context has a fairly supportive meaning with two positive terms (*yeah* and *right*) mutually reinforcing each other. Yet, as we all know, given the right intonation and multimodal information the phrase can also be used to emphatically reject a proposition. Take the example in (1), which is taken from a TV interview:

(1) The doctor comes in and asks, Do you think you might be pregnant? and I was like,
Yeah, right. No. There's no way.
(Source: UCLA NewsScape Library of International Television News corpus, *KCBS Inside Edition*, 2019–09–12 02:00 UTC 900–907) [emphasis TH]

In (1), a woman describes how a doctor asked her whether she was pregnant, when she was adamant that she could not be. To his question *Do you think you might be pregnant?*, she replied *Yeah, right*. Her intonation already signals that she does not use the phrase to answer affirmatively (neither *yeah* nor *right* carry a high tone as expected from the positive use of the term; instead she starts with a fairly low tone on *yeah* and slight fall on *right*). Besides, when listening to the audio file, it also becomes clear that she precedes the phrase with *pf-haha* (which is not transcribed by the closed



Figure 4.1a Frame grabs of *Pf-haha. Yeah, right*, from (1)



Figure 4.1b (2)
Source: https://twitter.com/BCAFCBH/status/1052545836297715712 (accessed October 27, 2019).

caption in (1)), which also prompts the viewer to parse the phrase in a non-affirmative way. Finally, she also signals her illocution by additional multimodal information.

Figure 4.1a breaks down the phrase from (1) into three parts. Preceding it is the interjection *Pf-haha*, during which the speaker closes her eyes and looks to her right and slightly downwards. Then on *yeah*, she pulls back her head (physically distancing herself from the doctor's proposition that she might be pregnant). Finally, on *right* the head comes forward, the head of the eyebrows is raised and their curve at rest, and she shakes her head right-to-left (a conventional symbol for negation in Western cultures).

Hearers thus get complex multimodal packages of information that inform them how to really interpret the verbal signal. As mentioned above, when there is no face-to-face communication, writers use emojis to signal their intended meaning. Take the example of *Yeah right* from Twitter in Figure 4.1b.

By adding the emoji , the speaker provides multimodal information that he disagrees with the previous Twitter message (that there was no match fixing of a football game, but that the score was

only due to a bad goalkeeper). More than that, however, that particular emoji also adds the information that the writer finds this explanation ridiculous (and, additionally, the emoji is sometimes also used to ridicule someone else's opinions).

How can humans do this? How can we pack and unpack such complex semiotic information so quickly and easily? From an evolutionary point of view, scientists agree that about 100,000 to 70,000 years ago, the success story of our species started (Harari 2014). Scientists argue that therefore our species must have been affected by a major evolutionary change that significantly increased our mental abilities—the so-called Cognitive Revolution (Goldberg 2018; Harari 2014). Changes to our brain enabled us not only to plan and carry out more and more complex actions, but also to communicate larger quantities of information to each other. Key to this, was, of course, the invention of language, i.e., our ability to communicate through symbols (Deacon 1997; Tomasello 1999). Once we were able to communicate with each other through arbitrary and conventional pairings of a form (a string of sounds or letters, a picture, a gesture, etc.) with a meaning (a mental concept), we were able to exchange large quantities of information with each other. Information that not only included facts about the world, but also helped to build and maintain complex social relationships as well as fictional concepts (such as tribal spirits, money, or nations; Harari 2014: 41).

Now, all modern linguistic theories agree that the majority of words of any language (excluding deictic elements and onomatopoeia, which additionally also exhibit indexical as well as iconic properties) are prototypical symbols: the English word *airport* and its German and Hungarian equivalents, *Flughafen* and *repülőtér*, for example, can all be said to express a similar mental concept by different conventionalized forms ([ˈeəpɔːt], [ˈfluːghaːfən] and [ˈrɛpyløːteːr]). Yet, most of the time, speakers do, of course, not just produce single words, but string these together into larger utterances (such as, e.g., *I'm getting a taxi to the airport*, or *The airport was closed*).

In addition to linguistic signs, many linguistic approaches postulate independent and meaningless syntactic rules that combine words into sentences. In contrast to such "items and rules" grammars, several approaches have emerged over the past 30 years that claim that arbitrary form-meaning pairings are not only a useful concept for the description of words but that all levels of grammatical description involve such conventionalized form-meaning pairings. This extended notion of the Saussurean sign has become known as the "construction" (which includes morphemes, words, idioms, as well as abstract phrasal patterns) and the various linguistic approaches exploring this idea were labeled "Construction Grammar" (Boas, this volume; Croft 2001; Goldberg 2006; Hoffmann 2017a, 2017b; Hoffmann & Trousdale 2013).

The present contribution explores how Construction Grammar can account for multimodal utterances such as (1) and (2). Next, section 2 will, first of all, introduce the basic tenets of Construction Grammar and will show how multimodal utterances are analyzed by this theoretical approach. Then, section 3 will provide an empirical study of multimodal instances of one particular construction, the English Comparative Correlative construction (e.g., *the more you eat, the fatter you get*; Hoffmann 2019a). Finally, section 4 will summarize again the main points raised by this study. In particular, it will highlight the importance of the online combination of constructions in the working memory by a well-known domain-general process (namely, Conceptual Blending).

2. Multimodal Construction Grammar

Instead of assuming a clear-cut division of lexicon and syntax, Construction Grammarians consider all constructions to be part of a lexicon-syntax continuum (a "constructicon"; Fillmore 1988; see also Goldberg 2003: 223; and Jurafsky 1992). Examples from this continuum are given in (3)–(5) (employing a fairly informal description of the form and meaning parts; for various different approaches to the representation of constructions, cf. Hoffmann and Trousdale 2013; Hoffmann 2017a, 2017b):

(3) morpheme construction
un-V-construction:
FORM: $[[[\text{ʌn}]_1\text{-V}_2]] \leftrightarrow$ MEANING: "reverse$_1$ V-action$_2$"
(e.g., *undo, untie, uncover*)

(4) idiom construction
FORM: $[\text{X}_1\ \text{SPILL}_2\ [\text{ðəbi:nz}]_3] \leftrightarrow$ MEANING: "X$_1$ divulge$_2$ the-information$_3$"
(modeled on Croft and Cruse 2004: 252)
(cf. *He spilled the beans*, *She has spilled the beans*,
Their neighbours will spill the beans)

(5) Intransitive Motion construction:
FORM: $\text{X}_1\text{Y}_2\text{Z}_{3_\text{path/loc}} \leftrightarrow$ MEANING: "Theme$_1$ moves-by-Manner$_2$ GOAL$_{3_\text{path/loc}}$"
(e.g., *She ran into the room*, *The fly buzzed out of the window*,
They strolled along the road)

Just like the word construction *airplane* above, all the constructions in (3)–(5) are symbols—pairings of FORM and MEANING, with the bidirectional arrow "↔" expressing the arbitrary, symbolic relationship of the two poles: (4) has a FORM pole ($[\text{X}_1\ \text{SPILL}_2\ [\text{ðəbi:nz}]_3]$) as well as a MEANING pole ("X$_1$ divulge$_2$ the-information$_3$"). In contrast to word constructions, whose FORM pole is completely phonologically fixed, other constructions can contain schematic slots, i.e., positions that can be filled by various elements. While *the beans*-part in (4) is phonologically fixed (you cannot, e.g., say *He spilled the peas* with the intended idiomatic meaning), various NPs can appear in the subject X slot (see the examples in (4)). Moreover, the verb in (4) has to be the lexeme construction SPILL (which, however, is at least partly flexible in that it is slot for various tensed verb forms such as *spilled* or *will spill*; cf. (4)). Similarly, a morpheme construction such as the *un*-V-construction comprises fixed as well as schematic positions (3). The Intransitive Motion construction in (5), on the other hand, is a completely schematic construction that only contains slots for the theme X, the verb Y, and the path-/location-goal Z (and thus licensing diverse structures such as the ones given in (5)).

How do speakers acquire all these constructions? So-called usage-based Construction Grammar approaches (cf., e.g., Boas, this volume; Bybee 2006, 2013; Croft 2001; Goldberg 2003, 2006; Lakoff 1987) maintain that the mental constructicon of speakers is shaped by the repeated exposure to specific utterances (so-called "constructs") and that domain-general cognitive processes such as categorization, chunking, or cross-modal association play a crucial role in the mental entrenchment of constructions. This basically presupposes an exemplar-based view (Bybee 2013) that holds that each individual token of usage that we are exposed to leaves a trace in the long-term memory repository of constructions, the constructicon. At the same time, as with all other types of experiential knowledge, construction memory traces are subject to decay unless they get reactivated by future usage (cf. Goldberg 2013: 27). Under this view, schematic slots arise if a pattern is observed across similar, yet slightly different constructs, i.e., high type frequency (Croft & Cruse 2004: 292–293).

How is all of this relevant for multimodal language use? As mentioned above, human communication is inherently multimodal. Since constructs appear in a rich "social, physical and linguistic context" (Bybee 2010), this contextual information can also be stored alongside the phonological, syntactic, and semantic information. This has several implications for multimodal communication studies: First of all, if a gesture (e.g., the thumbs-up sign 👍) is repeatedly used with a similar meaning ("I agree!" or "Good!") in a culture, then such "emblems" (McNeill 2000: 2–6) must be stored as unimodal gesture constructions (cf. Langacker 2005: 104; Hoffmann 2017c; Zima 2017). Recently, however, several authors explored the idea that in addition to unimodal gesture constructions, humans might also store multimodal constructions—constructions with verbal and gesture FORM elements that express a joint MEANING (Zima & Bergs 2017a). Studies that explicitly discuss the

ontological status of such multimodal constructions include, e.g., Andrén (2010); Steen & Turner (2013); Zima (2014, 2017); Csienki (2015); Schoonjans (2014); Schoonjans, Brône, & Feyaerts (2015); Pagán Cánovas & Antovic (2016).

Now, the ontological status of multimodal constructions remains a controversial issue in Construction Grammar: Ningelgen and Auer (2017), for example, note that the gesture part of many speech-gesture combinations is only co-expressive (it appears to only emphasize a meaning already expressed by the verbal form elements) and, thus, optional. Under this view, gestures are only non-entrenched additives. This leads Ziem (2017) to claim that one can only argue for the existence of a multimodal construction, if both gesture and verbal form are obligatory: Only if the suppression of the gesture leads to the uninterpretability of a construction, does a gesture + verbal form-meaning pairing qualify as a construction under this definition.

On the other hand, a great number of authors have criticized this strict definition of multimodal constructions. As, for example, Lanwer (2017), Schoonjans (2017), or Ziem (2017) pointed out, entrenchment is a gradual phenomenon. Consequently, we can expect a continuum of constructions ranging from those with an infrequent and loose gesture use, on the one end, to those with a frequent and systematic use of co-instantiated gesture-verbal pairs, on the other end. Several candidates for frequent multimodal constructions have, recently, been put forward: Bressem and Müller (2017) have shown that German speakers consistently use a Throwing Away Gesture with several verbal elements (namely, particles/negation/nouns, verbs, and adverbs). In all of these uses, the gesture adds a meaning of dismissive quality or negative assessment to the construction. Similarly, Mittelberg (2017) provides strong empirical evidence for multimodal existential constructions in German (in which the verbal pole *Es gibt* … ("There is/are …") is often paired with a "schematic gestural enactment […] of giving or holding something" (Mittelberg 2017: 1). Similarly, Ziem (2017) argues that the English [*all the way from* X PREP Y]-construction is multimodal in nature: In her NewsScape data, around 80% of all uses of the construction appear with a co-speech gesture. Concerning the meaning component that the gestures add to the construction, she distinguishes two sub-meanings: On the one hand, a deictic meaning that is often employed by weather forecasters to present the movement or place of a particular weather phenomenon on an iconic map. On the other hand, an iconic function that "coexpresses a referent's vastness or exceptional magnitude" (Ziem 2017).

From a usage-based constructionist perspective, it therefore appears very likely that the mental grammars of speakers will also contain a considerable number of multimodal constructions. At the same time, there are still important methodological issues that need to be addressed in the study of multimodal constructions: "whether a gesture is an integral part of a construction will depend on the salience (Ellis 2013: 371) as well as the frequency with which gesture and verbal FORM co-occur to express the same MEANING" (Hoffmann 2017c). One way to test whether the association of gesture and verbal FORM appears significantly more often than expected by chance would be to employ a collostructional analysis (for an overview, cf. Gries 2013: 99–100; and Stefanowitsch 2013); however, such an analysis requires researchers not only to get information on the frequency of a multimodal structure, "but also data on the frequency of the same gesture in other constructions, the frequency of other gestures in the same construction as well as the frequency of other multimodal gestures and constructions—information that, particularly for large corpora, will be difficult to obtain" (Hoffmann 2017c). Moreover, as Schmid (2020) has pointed out, entrenchment is an individual cognitive process, whereas corpus data are normally aggregate data from a great number of individuals. Consequently, constructions that express a basic human meaning and/or ones that have a high frequency in a community can be investigated using corpus data, because the patterns observed in the corpus data can be taken as representative of the input of an individual. Argument Structure constructions, for example, which express basic human scenes and have a very high type frequency, consequently, lend themselves very well to corpus linguistic analyses. For rarer constructions, on the other hand, corpus data have to be taken with a grain of salt and need additional corroboration from other data sources. This might be particularly true for multimodal

constructions, for which individual variation is possibly greater and where people might entrench individual, idiosyncratic multimodal constructions. All of these issues will, obviously, have to be addressed by future multimodal constructionist studies.

Beyond the question of whether a multimodal gesture and verbal pair constitutes a multimodal construction, however, Hoffmann (2017c) argued that multimodal communication has other, equally important repercussions for Construction Grammar as a cognitive theory of language. As mentioned above, constructions are FORM-MEANING pairings that are stored in the long-term memory. Constructs, on the other hand, are concrete utterances that are produced in the working memory (Cowan 2008; Diamond 2013). Only in rare cases, does a construct instantiate a single construction (e.g., when you produce a prefab greeting such as *Good morning!* or a saying such as *An apple a day keeps the doctor away*). Instead, in the working memory a construct will be "constructed" by drawing on a number of constructions from the long-term memory. Hoffmann (2018), for example, discusses the construct *Firefighters cut the man free*. As he shows, the construct draws on several constructions, including the Resultative construction (FORM: [X V Y Z] ↔ MEANING: "X causes Y to become Z by V-ing"), e.g., *They elected him president*; *She wiped the table clean*; Hoffmann 2017b: 285), as well as a multitude of other constructions (*inter alia*, the *Firefighter*-lexical construction, the Plural-N-construction, the Verb-Specific *cut*-construction, etc., see Hoffmann 2018 for details).

How is the combination of constructions into constructs normally modeled in Construction Grammar? More cognitively-oriented approaches remain vague on this, claiming, for example, that "constructions […] combine freely as long as there are no conflicts" (Goldberg 2006: 22). Current formal approaches (Bergen & Chang 2005, 2013; Boas & Sag 2012; Michaelis 2010, 2013; Steels 2013), on the other hand, use "constraint-satisfaction" to model construction combination. Without going into technical details, suffice it to say here that constraint-based approaches are very flexible computational tools that, for example, allow for partial matching of structures such as fragments as long as no constraints are violated (see Müller 2018: 497–505). Consequently, constraint-based approaches are highly successful at parsing natural language data. However, from a cognitive perspective the question arises whether constraint-satisfaction is also a useful metaphor for what the mind does. Do we only combine constructions into constructs in the working memory using constraint-satisfaction? And if so, is this a language-specific or domain-general process? Besides, how could multimodal information be created using constraint-satisfaction?

Instead, from a cognitive perspective, it seems more plausible to claim that Conceptual Blending drives constructional combination in the working memory (Fauconnier & Turner 2002; Turner 2018; Hoffmann 2019b). Conceptual Blending is a domain-general process that has been used to explain human behavior across all domains of higher-order human cognition (http://blending.stanford.edu)—including mathematical invention, scientific discovery, reasoning, inference, categorization, art, music, dance, social cognition, advanced tool innovation, religion. It allows to selectively combine two or more input spaces to create a conceptual structure which often has new, emergent meaning. This approach offers a straightforward account of how gesture and verbal information can become integrated into a single multimodal construct in the working memory (e.g., Steen and Turner 2013; Turner 2018). For all multimodal constructions must, by definition, have started out as creative, nonce pairings of gesture and language in constructs. Only after that, depending on the frequency of their repeated use, could these then become entrenched as multimodal constructions. Moreover, as Mittelberg (2013) points out, gesture use itself is affected by cognitive semiotic principles that are also at work in language (e.g., iconicity, indexicality, metaphor, metonymy, and image schemata). Using Conceptual Blending as the driving force of construction combination, thus, offers a fully cognitive analysis of unimodal as well as multimodal language use that only draws on domain-general principles. The next section will provide a case study that showcases such an analysis.

3. Case Study: Comparative Correlative Constructions

The Comparative Correlative (CC) construction (cf. e.g., Culicover & Jackendoff 1999; Fillmore, Kay & O'Connor 1988; Hoffmann 2019a) is a fairly complex constructional template:

(6) CC construction
FORM: [ðə[]$_{\text{comparative phrase1}}$ clause$_1$]$_{C1}$ [ðə []$_{\text{comparative phrase2}}$ clause$_2$]$_{C2}$
↔
MEANING:
[As the degree of comparative phrase1 increases/decreases]$_{\text{independent variable}}$
[so the degree of comparative phrase2 increases/decreases]$_{\text{dependent variable}}$
(simplified from Hoffmann 2019a: 140)

(e.g., *The* [*more tired*] *he is*]$_{C1}$ [*the* [*more mistakes*] *he makes*]$_{C2}$,
The [*more*] *you eat*]$_{C1}$ [*the* [*fatter*] you get]$_{C2}$,
The [*more tired*] *you are*]$_{C1}$ [*the* [*more mistakes*] you make]$_{C2}$)

As (6) shows, CC constructions consist of two clauses (C1 and C2). On the formal level, both clauses are introduced by fixed substantive, phonologically-specified material ([ðə…]$_{C1}$ [ðə …]$_{C2}$), which are followed by schematic, open slots (which include two obligatory comparative phrases; cf. e.g., [*more tired*]$_{\text{comparative phrase1}}$ and [*more mistakes*]$_{\text{comparative phrase2}}$ in (6)). Semantically, the construction displays symmetric as well as asymmetric properties: On the one hand, the clause-internal semantics of C1 and C2 is similar: Over time something increases or decreases. At the same time, the relationship between C1 and C2 is asymmetric: C1 acts as the independent variable/cause/protasis to the dependent variable/effect/apodosis (cf. Goldberg 2003: 220; e.g., *the more tired he is → the more mistakes he makes*; for a more detailed discussion of the construction's semantics; cf. below and Beck 1997; Cappelle 2011).

Due to the construction's complex semantics, there are several theoretically relevant questions that arise in the multimodal analysis of its constructs: How do speakers gesture when they produce instances of the CC construction? Do they highlight the symmetric properties of the construction's meaning or do they foreground the asymmetric cause-effect relationship of C1 and C2? How are the gesture meaning and the CC meaning combined in the working memory? Finally, is there any evidence for entrenched, multimodal constructions?

In order to address the questions, an empirical corpus study was carried out. The data for this came from one of the largest corpora of spoken English, the UCLA NewsScape Library of International Television News corpus from the RedHen project (http://newsscape.library.ucla.edu/). The NewsScape corpus contains multimodal TV data and is hosted at the library of the University of California, Los Angeles. It contains more than 250,000 hours of television and video news programs from 2005 to the present and comprises more than 2 billion words. The corpus includes a broad range of programs from traditional news broadcasts to talk shows, commercials, and interview programs, etc. Since reading "a text or recit[ing] a pre-prepared speech more or less verbatim, is no longer the standard way to communicate on television" (Steen et al. 2018: 4), the corpus is an ideal source for spontaneous communication. The data for the present study were extracted from the Erlangen CQPweb interface (https://corpora.linguistik.uni-erlangen.de/newsscape) using the regular expression in (7):[1]

(7) "the" [pos = "JJR|RBR"] []* "the" [*pos*="JJR|RBR"] []* [pos = " \."]within s

This search looked for all instances of *the* immediately preceding a comparative adjective (JJR) or adverb (RBR) (the start of C1) that, after material of any length ([]*), was followed by an

identical structure (the start of C2). The final requirements ("pos=" \. "]within s") ensured that both C1 and C2 clauses were part of a single sentence. This query yielded 33,335 hits in 29,735 different texts (in 2,147,483,647 words [320,955 texts]) from which a sample of 1,000 hits was drawn. This sample comprised 138 tokens that were not instances of the CC construction and that, consequently, had to be excluded (cf., e.g., *Whether or not Mitch McConnell decides to blow up* ***the lower*** *federal courts, which Harry Reid got rid of the filibuster for* ***the lower*** *court*, which matches the search query, but is not a CC construction). Another 240 tokens were repetitions of CC tokens from TV shows or ads that were aired multiple times. In order not to skew the results, these repeated tokens were also excluded from the present study. This left 442 (= 1,000 – 138 – 249) unique CC tokens for further analysis. In 317 out of these 442 tokens, the speaker's hands were not visible (e.g., when on-screen text was blocking out the hands or when speakers were off-camera providing only voiceovers). In other words, in more than 70% of all instances (= 317/442 = 71.7%), the constructs were easily interpretable as instances of the CC constructions without any gesture. Following Ziem (2017), one could, therefore, argue that gestures are not an obligatory element of CC constructions and that these, consequently, are not stored as multimodal constructions.

However, as we have seen above, from a usage-based perspective, obligatoriness should not be used as the only criterion for identifying multimodal constructions. When we only look at the 125 CC tokens (= 442 – 317) in which the speakers' hands are visible, we find that in 80% (= 100/125) of all cases speakers do gesture (and, in only 25/125 tokens = 20%, they do not). Now, keeping in mind Schmid's (2020) caveat about interpreting aggregate corpus data as evidence for individual entrenchment, we can nevertheless say that speakers seem to show a preference for accompanying the CC construction with some sort of gesture—but what type of gesture?

In line with the semantics of CC construction outlined above, the 100 tokens with visible gestures were classified according to the following coding scheme:

- If both (or the same hand) carried out an identical gesture on C1 and C2, the token was coded as "PARALLEL" (see Figure 4.2). This was taken as an indication of the iconic expression of the parallel semantics of C1 and C2.
- If both hands or alternating hands moved in a similar fashion, but in different directions in C1 and C2, the token was classified as "SYMMETRIC" (see Figure 4.3). This was interpreted as an iconic expression of the asymmetric relationship of C1/cause and C2/effect.
- Finally, if the hands showed a movement that could not be related to the construction's meaning in the above way, the token was coded as "DIFFERENT" (see Figure 4.4).

The example in (8) is accompanied by a "PARALLEL" gesture, as can be seen in Figure 4.2:

(8) the more of us who talk about it, the easier it will get …
(Source: UCLA NewsScape Library of International Television News corpus, *KTTV-FOX The Dr Oz Show*, 2017–03–29 20:00 UTC, 2892–2896)

As the top three panels of Figure 4.2 show, on both C1 and C2 the speaker uses both hands in an identical fashion: using Bressem's (2013) notation system, we can see that both hands have a flat hand configuration and orient towards the "centercenter" (McNeill 1992: 89) of the speaker's body at the start of C1 and C2. Then, on the comparative element (*more of us* and *easier*, respectively), the same type of arced movement occurs: both hands move slightly up and away from the body in an arced fashion.

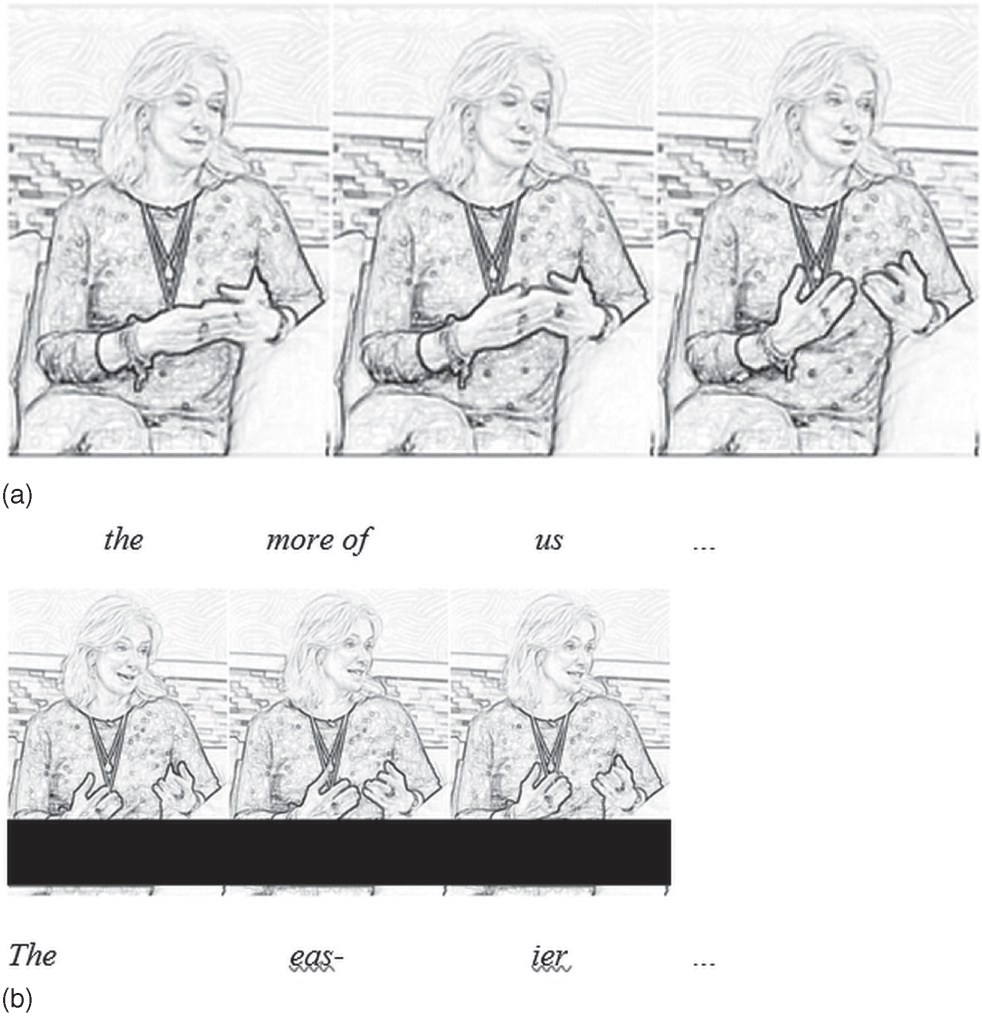


Figure 4.2 Frame grabs of the CC construction in (8) (on-screen caption has been blacked out in the lower panel set)

In other situations, such as (9), we find a "SYMMETRIC" movement (see Figure 4.3):

(9) and the more he's afraid, the more he's going to talk.
(Source: UCLA NewsScape Library of International Television News corpus, *MSNBC Hardball With Chris Matthews*, 2017–03–31 23:00 UTC, 218–223)

For the entire CC construction in (9), both hands are flat and palms lateral towards the center. During C1, the speaker moves both hands away from the center to his left. For C2, he then carries out a similar motion, but in the opposite direction: both hands now move over the center to his right.

While "PARALLEL" gestures such as in Figure 4.2 seem to highlight the symmetric semantic aspect of the CC construction, gestures such as the one in Figure 4.3 on the one hand, of course, also embody this symmetric aspect as well (because hand configuration and type of movement are similar). In addition to this, the movement into opposite directions also highlights the asymmetric semantic relationship between the two clauses. However, these are not the only types of gestures



Figure 4.3 Frame grabs of the CC construction in (9) (on-screen caption has been blacked out in the lower panel set)

that can be found with CC constructs. Sometimes, the gestures also focus on other aspects and can be neither classified as "PARALLEL" nor "SYMMETRIC". Take example (10), which was classified as "DIFFERENT":

(10) Did you know that the more stress you have, the more likely you are to be obese …
(Source: UCLA NewsScape Library of International Television News corpus, *HLN Morning Express With Robin Meade*, 2017–02–24 14:00 UTC, 1471–1480)

In C1 (top panel of Figure 4.4), the speaker uses only her left hand with a stretched index finger. The palm is diagonally up towards the center and the hand performs three downwards beat gestures in all three frames (indicated by the downwards arrow). On C2 (bottom panel of Figure 4.4), she then uses both hands, which are flat with their palms lateral towards the center. As can be seen by the downwards arrow, both hands again perform a downwards beat gesture, while moving to the speaker's right (in fact, the following *you* and *are* also get this beat gesture). Beat gestures are gestures that have no discernible meaning (McNeill 1992: 80–82), but seem to structure an

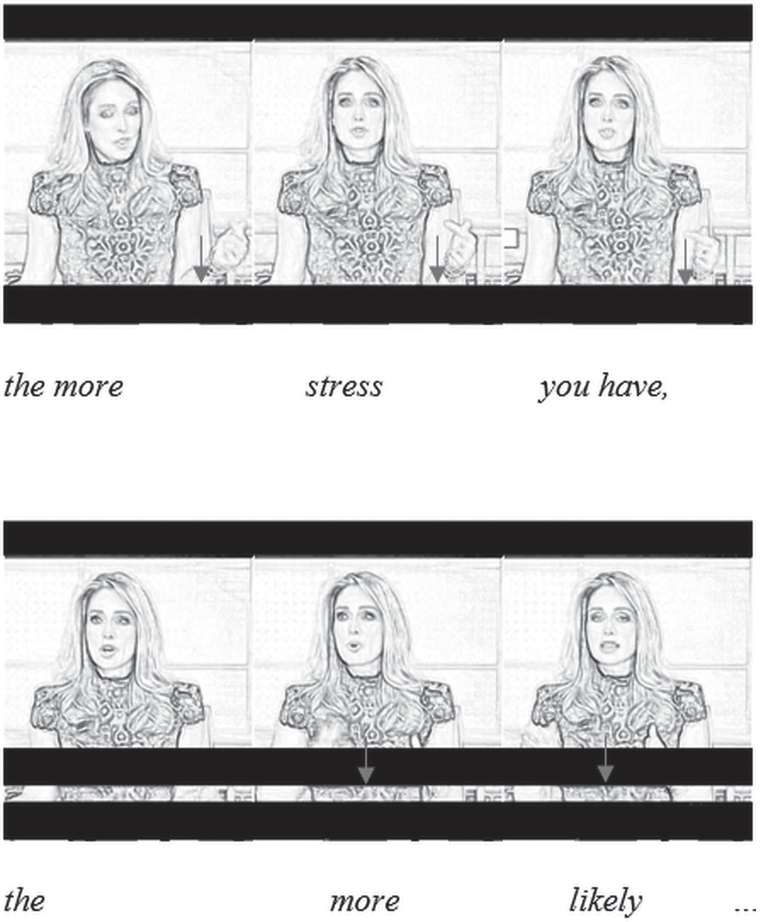


Figure 4.4 Frame grabs of the CC construction in (10) (on-screen caption has been blacked out in the lower panel set)

utterance rhythmically "when the speaker is emphasizing something that is quite specific and important" (Kendon 2013: 16, who speaks of a parsing function). Much more could, of course, be said about the multimodal construct in (10) (e.g., that the stretched index finger on C1 can also be seen as a marker of importance). For the current analysis, however, the gesture on C1 clearly was not motivated by the semantics of the CC construction and thus constructs such as (10) were classified as "DIFFERENT".

Figure 4.5 gives the results of the analysis of the gesture types for those 100 tokens from the NewsScape corpus which exhibited a clear, visible gesture on C1 and C2.

As Figure 4.5 shows, the data do not seem to indicate that a particular multimodal pattern has been entrenched for CC constructions: 46 tokens have "DIFFERENT" gestures on C1 and C2, 44 tokens exhibit "PARALLEL" gestures, while 10 tokens had "SYMMETRIC" gestures. If anything, keeping in mind the problem of aggregate data as evidence for individual entrenchment, speakers seem to prefer "PARALLEL" gestures over "SYMMETRIC" ones. This is in line with research on present-day CC constructions (which, as Hoffmann 2019a has shown, have become more and more parallel with respect to a wide range of syntactic phenomena).

So, if no particular multimodal templates appear to be entrenched, what is a constructionist approach to multimodal phenomena such as (8)–(10)? As mentioned above, all these instances

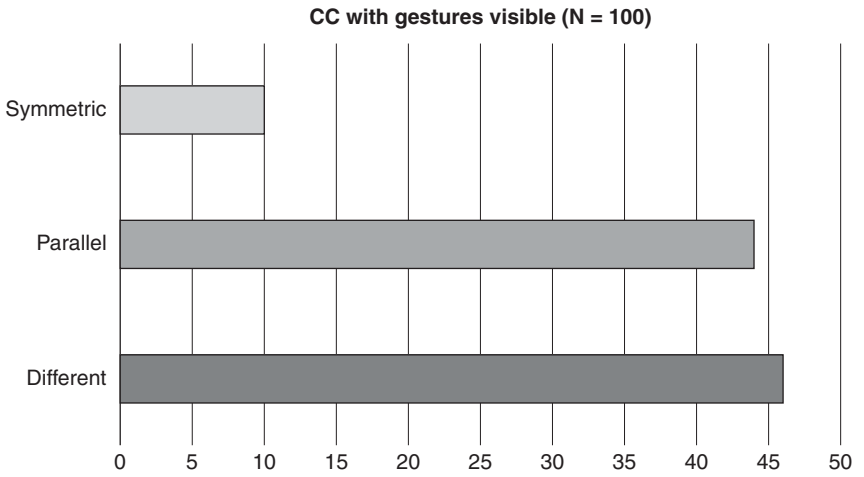


Figure 4.5 Distribution of gesture types in the NewsScape sample of CC constructs

show that speakers can easily add intelligible gestures to a verbal construction by blending both in the working memory. "SYMMETRIC" as well as "PARALLEL" gestures are, obviously, co-expressive and optional, as Ningelgen and Auer (2017) would point out. A singular focus on the question of multimodal constructions misses the point, however. Just because these gesture do not add any additional semantic meaning, does not mean that they are not of theoretical relevance. In (8) and (9) speakers felt the impulse to focus on the symmetric and the asymmetric properties of the CC construction, respectively. In (10), the need to visually express emphasis led to the beat gestures. Gestures, thus, might be optional—but they nevertheless always convey crucial information: "Spontaneous co-verbal gestures offer insights into imagistic and dynamic forms of thinking while speaking and gesturing" (McNeill 2013a: 29). Besides, before the first human ever entrenched the first construction in his or her long-term memory, he or she had to associate its form and meaning in the working memory. The working memory, therefore, has and still is the prime locus of "construction-ing", of symbolically associating a form with a meaning—the engine of creative uni- and multimodal semiosis.

4. Conclusion: Multimodal Construct Grammar

Construction Grammar is not just a theory of grammar. It is a framework that also offers important insights into human semiosis and thinking (Bergs & Hoffmann 2018; Hoffmann 2017c). Recently, a great number of studies have explored the ontological status of multimodal constructions. As the present overview has shown, this avenue of research shows great promise, even though several methodological and theoretical questions still remain to be answered. Beyond that, however, I have pointed out that the study of multimodal constructs is also a fascinating topic. Particularly when there are no multimodal constructions, multimodal constructs provide a fascinating window into the on-line semiotic processes in our working memory. The examples in (1) and (2) show how complex thoughts are expressed by the creative combination of form-meaning pairings from various modes. Much exciting research remains for the study of Multimodal Construction Grammar as well as Multimodal Construct Grammar.

Note

1 I am indebted to Thomas Brunner, Mark Turner, and Peter Uhrig for their help in finding the best way to formulate this search query.

Further Reading

The most comprehensive overview of gesture studies is provided by the two volumes of *Body—Language—Communication: An International Handbook on Multimodality in Human Interaction*, edited by Müller et al. (2013, 2014). A good starting point for further reading on the ontological status of multimodal constructions as well as related methodological and theoretical issues is the special issues of the *Linguistics Vanguard* edited by Elisabeth Ziemand and Alexander Bergs (2017b). For more information on NewsScape as a data source for Multimodal Construction Grammar studies see Ziem (2017).

Related Topics

construction grammar and frame semantics; multimodality; culture in language and cognition; signed languages and cognitive linguistics; cognitive linguistics and gesture

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5

NATURAL SEMANTIC METALANGUAGE

Cliff Goddard

1. Overview and Definitions

The Natural Semantic Metalanguage (NSM) approach is a cognitive approach to meaning which uses a metalanguage of simple, cross-translatable words as its principal method of representation. At base, this metalanguage relies on 65 semantic/conceptual primes (often termed simply, semantic primes), for example: I and YOU, SOMEONE and SOMETHING, HAPPEN and DO, WANT and KNOW, GOOD and BAD, IF and BECAUSE. Semantic primes are posited to be shared human concepts, and evidence suggests that they manifest themselves as words or word-like expressions in all or most human languages. Consequently, explications and scripts written in the NSM metalanguage can be regarded equally as linguistic and as conceptual analyses.

There is a large body of published work in the NSM framework, spanning a wide range of topics in lexical semantics, lexicogrammar, and ethnopragmatics in many different languages (see bibliographies at nsm-approach.net). Much of this work connects with cultural aspects of language and cognition.

1.1 The Crucial Importance of Metalanguage

The basic tenets of the NSM approach can be introduced as follows. In order to describe the meanings of words and their combinations, one has no choice but to use words themselves (or other derivative devices, such as logical symbols). One therefore needs to proceed very carefully to avoid getting tangled up in conceptual circularity and confusion, and to ensure that any explanations are as clear and explicit as possible. To avoid any hidden Anglo/Euro bias, the safest strategy is to rely as far as possible on words which have equivalents in all or most languages. The ideal metalanguage for semantic and conceptual analysis therefore consists of simple, cross-translatable words (and their associated cross-translatable grammar). NSM linguists have been working for nearly four decades to construct and refine such a metalanguage. Notwithstanding some open questions, it can now be regarded as substantially complete.

Many linguists disregard metalanguage considerations, but to do so means overlooking a fundamental logical issue and risks constructing theories and methods on foundations which are unstable and Anglo/Eurocentic.

1.2 Distinctive Features of the NSM Approach

The most distinctive features of the NSM approach are its use of paraphrase in ordinary language as a technique for modeling meanings and concepts, and its "words-first" focus (including words-in-combination and words-in-construction). It is a theory with comprehensive scope, applicable across many domains and departments of the language phenomenon (words, grammar, discourse, cultural pragmatics). The approach is humanistic, seeking and welcoming links with ethnography, literary, and other cultural studies, as well as applications in language teaching, intercultural communication, and accessible language.

1.3 Key NSM Concepts

1.3.1 Semantic/Conceptual Primes

Semantic/conceptual primes are concepts which are so clear and so fundamental to human thinking that they cannot be explained in any simpler terms. In adult languages they can be identified and externalized by words, but they can clearly exist without words, for example, in infant children and in chimpanzees (Goddard, Wierzbicka, & Fábrega 2014; Wierzbicka 2015). Evidence indicates that semantic primes are expressible as words or word-like expressions in all or most languages. Words which stand for semantic primes in a given language are known as exponents of primes. Table 5.1 shows the full inventory of primes, using English exponents.

Compared with many systems of semantic analysis, the NSM inventory of semantic primes has a strikingly "human" and subjective quality. First, I and YOU are both semantic primes, which implies that first-person and second-person orientations are integral to human thinking, and cannot be reduced to third-person formulations. There is a clear ontological distinction drawn between

Table 5.1 Semantic primes, English exponents

I, you, someone, something~thing, people, body	substantives
kinds, parts~have parts	relational substantives
this, the same, other~else	determiners
one, two, some, all, much~many, little~few	quantifiers
good, bad	evaluators
big, small	descriptors
know, think, want, don't want, feel, see, hear	mental predicates
say, words, true	speech
do, happen, move	actions, events, movement
be (somewhere), there is, be (someone/something)	location, existence, specification
(is) mine	possession
live, die	life and death
time~when, now, before, after, a long time, a short time, for some time, moment	time
place~where, here, above, below, far, near, side, inside, touch	place
not, maybe, can, because, if	logical concepts
very, more	augmentor, intensifier
like	similarity

Source: After Goddard & Wierzbicka 2014.

Notes: Exponents of primes can be polysemous, i.e., they can have other, additional meanings. Exponents of primes may be words, bound morphemes, or phrasemes. They can be formally complex. They can have language-specific combinatorial variants (allolexes, indicated with ~). Each prime has well-specified syntactic (combinatorial) properties.

SOMEONE and SOMETHING, i.e., there are no category-less "participants", "arguments", or "entities". There is a rich inventory of mental and speech primes: WANT, DON'T WANT, THINK, KNOW, and SAY. These have important implications for modeling human subjectivity and intersubjectivity. PEOPLE is a semantic prime. No other system of conceptual analysis has any analogue of this preeminently "social" semantic unit.

Second, one may note the experiential orientation of primes such as SEE, HEAR, and FEEL. There is a connection with embodiment in the presence of the prime BODY itself, and the combination with PARTS ('parts of someone's body'). The primes ABOVE and BELOW also implicitly reflect an experiential perspective. It is worth mentioning that these can be recruited into ways of thinking about people; e.g., 'I think about this someone like this: this is someone above me'.

Third, many primes are inherently subjective in the sense that they implicitly represent construals (ways of thinking) rather than features of an assumed objective reality. Obvious examples are GOOD and BAD, BIG and SMALL, NEAR and FAR, MUCH~MANY and LITTLE~FEW, A LONG TIME and A SHORT TIME—and, less obviously, VERY. Finally, the inventory of semantic/conceptual primes includes many pairs of complementary, opposite and converse items, including I and YOU and BEFORE and AFTER, in addition to those just mentioned.[1] This dualistic tendency is surely a striking fact about human conceptual structure.

Below Table 5.1 are some key points about how primes can manifest themselves in languages. Some of these points can be expanded as follows. Exponents of primes are often polysemous—and differently polysemous in different languages. It is well-known, for example, that exponents of DO often also express the meaning 'make', exponents of FEEL often also express the meaning 'hear' or 'taste', exponents of BEFORE often also express the meanings 'in front of' or 'first', exponents of WORDS often also express the meanings 'message', 'story', or 'talk'. Allolexy refers to the existence (for some primes, in some languages) of two or more words (allolexes) which each stand for the same prime. For example, in English-based NSM the words *other* and *else* are allolexes of the prime OTHER; likewise, *I* and *me* are allolexes of the prime I. Essential to the concept of allolexy is that there is no viable, non-circular way to paraphrase any semantic difference between the items in question (see Goddard 2008: 5–8, for discussion). Sometimes a single word (a portmanteau) expresses a combination of primes, e.g., English *often* for 'at many times', Polish *tak* for 'like this'. In some languages, certain combinations of primes can only be realized via portmanteaus.

1.3.2 NSM Grammar (Conceptual Syntax)

Semantic/conceptual primes have an inherent conceptual syntax which is hypothesized to be equally realizable in all languages. The formal details (marking patterns, word order, constituent structure, etc.) of course differ between languages. In broad terms, NSM syntax can be seen as falling under three headings: (i) Basic combinatorics, e.g., between substantives and specifiers: THIS SOMETHING, THE SAME SOMEONE, SOMEWHERE ELSE, TWO PARTS, MANY KINDS, etc. (ii) Basic frames and extended valency options, e.g., the simplest frame for DO is 'do something', but one can also 'do something to someone', 'do something to something', and 'do something with someone'. (iii) Some mental primes have complement options; e.g., THINK has a quasi-quotational complement option (e.g., 'I think like this: …'), and KNOW has a complex but decomposable propositional complement option (e.g., 'I know that …') (see section 5.1). The combinatorial properties of semantic primes are literally universals of syntax.

Syntactic constructions which are available in some languages but not others, such as indirect speech constructions, are not allowed in the NSM metalanguage.

The syntactic texture of the NSM metalanguage is quite rich and cannot be easily summarized in a few general statements. The most important combinations and frames are itemized in the Chart of Semantic Primes.[2]

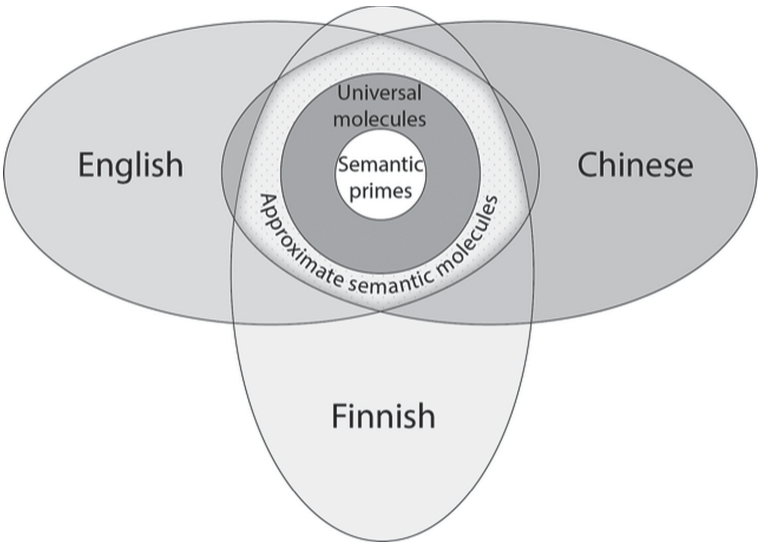


Figure 5.1 Relationship between semantic primes and molecules in three different languages (note: intersection area is tiny compared with full lexicon)

1.3.3 Semantic Molecules ([m] Elements)

Not all complex concepts are built up directly from semantic/conceptual primes. Languages also employ a set of "semantic molecules" that function alongside primes as conceptual building blocks. In NSM explications they are marked as [m]. Semantic molecules can be explicated without circularity into primes.

Many semantic molecules capture human experience with the world, naming basic bodily, sociocultural, and environmental experiences. Some appear to be universal, e.g., body parts such as 'head', 'legs', and 'mouth', descriptors such as 'long' and 'hard', and some verbs such as 'hold' and 'laugh'. Others may be approximate in the sense that near-equivalents exist in all or most languages, e.g., 'fish', 'bird'. Yet others are clearly culture-specific, e.g., 'money', 'God', 'number'.

Together, semantic primes, universal molecules, and approximate molecules represent an intersection of all languages. See Figure 5.1. From a cognitive point of view, semantic molecules enable enormous compression of conceptual content (see section 4.5).

1.3.4 Semantic Explications

In the NSM system, lexical meanings are represented by explanatory paraphrases known as semantic explications. The criteria for a good explication are several-fold: (a) It is phrased entirely in words and grammar of the NSM metalanguage; (b) It is coherent, i.e., makes sense as a whole; (c) It is compatible with the range of use of the word being explicated and with its relations with other words, entailments, frequent collocations, and so on; and (d) It satisfies native speaker intuitions about interpretation in context. Although these criteria allow one to evaluate proposed analyses, there are no fixed discovery procedures that lead directly from usage data to an optimal analysis. Essentially, the NSM analyst faces the same challenge as a lexicographer, i.e., formulating a paraphrase that matches the range of use of a word, but with the constraint of doing so using a controlled vocabulary of cross-translatable words.

NSM explications are not external descriptions, but ways of capturing human understandings. It therefore makes sense that they often contain components[3] such as the following:

often when someone does this, it is like this: ….
people often do this because they think like this: …
people can think about it like this: …

Explications typically range from 5 to 25 lines of semantic text. The repeated use of simple words and grammar imparts an unusual stylistic quality which can be disconcerting at first. Despite the simple phrasing of individual components, explications often display great complexity when considered as a whole. Examples of explications are given in section 4.

1.3.5 Derivational Bases ([d] Elements)

Aside from semantic molecules, there is a second way in which explications can include complex lexical meanings: namely, as derivational bases, marked in explications as [d]. Whereas semantic molecules appear in many concepts and domains, derivational bases enter into explications in a much more localized fashion. The concept of [d] elements was first developed to deal with derivational relationships, e.g., between the words *ill* and *illness*, or between the noun *knife* and the verb *to knife (someone)*. The idea is that the simpler of the two meanings appears inside the explication of the more complex one, i.e., the explication of *illness* includes 'ill [d]'; the explication of *to knife* includes 'knife [d]'. The notion of [d] elements has since turned out to have far broader applications; e.g., in NSM accounts of valency alternations.

1.3.6 Semantic Templates

A semantic template is an arrangement of component types which is shared by explications for words of a particular class or subclass. In any language, one may expect dozens of templates for various subclasses of verbs, nouns, adjectives, and so on. From a cognitive point of view, templates assist with managing complexity of information. Presumably they arise from high-frequency exemplar words, whose conceptual structures are acquired and elaborated in early childhood. For convenience, sections of a template are often labeled with technical names, but these labels are not part of the explication proper. For example, many physical activity verbs (e.g., *run, eat, cut, grind*) follow the template shown on the left in Figure 5.2. Many life-form words (e.g., *fish, bird*) and generic-level words (e.g., *cat, horse, kangaroo*) follow the template shown on the right in Figure 5.2.

It is worth expanding briefly on the notion of Lexicosyntactic Frame, which is particularly pertinent to verbs. A Lexicosyntactic Frame is the top-most set of components, expressed in a very generic way. These identify the core participants, inherent aspect, and other conceptual components that are important in the macro grammar of a language. Examples are shown in Figure 5.3.

In Figure 5.3, the Lexicosyntactic Frame in (a) is for verbs of bodily motion, such as *run*, *crawl*, and *swim* (Goddard, Wierzbicka, & Wong 2016). The one in (b) is for transitive activity verbs,

lexicosyntactic frame	category
prototypical scenario	main features
(incl. prototypical motivation)	where they live
how it happens (manner)	size
potential outcome	body
	sounds
	behavior
	relation to people
	how people think about them

Figure 5.2 Semantic templates for physical activity verbs (left) and ethnozoological terms (right)

(a)	someone does something somewhere for some time because of this, this someone is moving in this place during this time as he/she wants
(b)	someone does something to something for some time at the same time something happens to this something because of it
(c)	someone does something to something at this time because of this, after this, this something is not in the place where it was before

Figure 5.3 Lexicosyntactic frames for three subclasses of English "verbs of doing"

such as *eat*, *drink*, *pour*, and *cut*, with an affected object (Goddard & Wierzbicka 2016). If the verb implies a high degree of control over the ongoing effect, 'it happens as this someone wants' can be added. If there is an implied instrument, 'this someone does it with something' can be added. The Lexicosyntactic Frame in (c) is for verbs of induced change of location, such as *put* and *throw*. If the action is thought as momentary, 'it happens in one moment' can be added. Aside from "verbs of doing", there are of course many verbs based on HAPPEN, and others based on SAY. Many languages have mental and experiential verbs based on THINK and/or FEEL.

1.3.7 Cultural Scripts

The NSM metalanguage can be used to capture culture-specific norms, values, ways of thinking, and speech practices of a community. When used for this purpose, one speaks of cultural scripts, rather than explications. Cultural scripts usually begin with 'many people think like this' or a variant. Cultural scripts can have different levels of generality: High-level or "master" scripts capture leading values or ways of thinking, low-level scripts spell out the interactional consequences. Cultural scripts are not rules, nor does everyone in a given speech community necessarily agree with them, but they form part of the interpretive backdrop to discourse and social behavior in a particular cultural context. The NSM metalanguage can also be used to write scripts and texts of other kinds, e.g., belief scripts and teaching texts.

2. Historical Perspectives

2.1 Intellectual History

The existence of "simple ideas" as fundamentals of human understanding was accepted by the 17th-century philosophers such as Descartes, Pascal, Arnauld, Locke, and Leibniz. Among these polymaths, Leibniz (1646–1716) stands out as the most linguistic in his methodology. He experimented with definitions of numerous words, trying to establish "the catalogue of those concepts which can be understood by themselves, and from whose combinations our other ideas arise" (Leibniz 1966: 430).

After Leibniz's death, systematic empirical semantics lay dormant for centuries. It was revived in the 1960s by the Polish linguist Andrzej Bogusławski. He advocated seeking out the elementary units of thought through empirical investigations of natural languages. The project was taken up by Anna Wierzbicka, who made it her life work. Wierzbicka's first landmark publication in English was *Semantic Primitives* (1972). Shortly thereafter she moved to Australia and took up a post at the Australian National University, where she has been based ever since, currently as Professor Emerita. Renowned for its typological-descriptive studies and for fieldwork, the ANU Department of Linguistics was a conducive environment for the development of the NSM theory. In the 1990s, Wierzbicka began a long-term collaboration with Cliff Goddard, in both descriptive-analytical work and theory development.

The NSM approach can be thought of as a blend of Leibnizian conceptual analysis in the logical tradition, the humanistic European tradition of language scholarship, and Anglo-American descriptive linguistics.

2.2 Alignments

The only other major school of semantics which acknowledges the fundamental importance of metalanguage is the Moscow Semantic School, whose leaders (among many other brilliant scholars) are Jurij Apresjan and Igor Mel'čuk. It may therefore be counted as the closest theoretical neighbor to the NSM approach.

Within Cognitive Linguistics the most long-standing affiliation is with Frame Semantics, founded by Charles Fillmore, and more recently with cognitively-inflected varieties of lexical typology, such as those espoused by John Newman and Maria Koptjevskaya-Tamm. Functionally-oriented descriptive linguists are also natural allies with the NSM approach.

In relation to the language-culture connection, NSM's closest neighbor in Cognitive Linguistics is Cultural Linguistics, as conceived by Farzad Sharifian. Both have much in common with European ethnolinguistics, especially the Lublin school of Jerzy Bartmiński. Outside linguistics, NSM research has attracted significant attention from psychological and cultural anthropology, cultural psychology, and cultural discourse analysis.

2.3 Development of NSM Theory

NSM history can be sketched in four periods.

I: 1972 to mid-1980s. Only 13–14 semantic primitives were proposed. The term Natural Semantic Metalanguage was not yet in use. Wierzbicka did foundational work on emotions, speech acts, and concrete vocabulary.

II: Mid-1980s to mid-1990s. The prime inventory expanded, reaching 55 in number (Goddard 1989; Wierzbicka 1996). The additions were in response to empirical-descriptive work on time, space, quantification, and logical relations. There was a new emphasis on primes as lexical universals.

III: Mid-1990s to 2007. This period saw greater attention to syntax and to "whole metalanguage" studies. The prime inventory grew to 62. Many new researchers joined the NSM research effort.

IV: 2008–2020. The main trend was intensified attention to semantic molecules and templates. The prime inventory stabilized at 65.

Established NSM researchers can be arranged into chronological waves that roughly correspond to the above periods: (I) Bert Peeters, Felix Ameka, Jean Harkins, Cliff Goddard, (II) Zhengdao Ye, Jock Wong, Anna Gladkova, Rie Hasada, Deborah Hill, Kyung-Joo Yoon, Marie-Odile Junker, (III) Carsten Levisen, Maria Auxiliadora Barrios Rodriguez, Sandy Habib, Ulla Vanhatalo, Yuko Asano-Cavanagh, Carol Priestley, Zuzanna Bułat-Silva, Jeong-Ae Lee, (IV) Sophia Waters, Helen Bromhead, Adrian Tien, Radoslava Trnavac. Early career NSM researchers include Lien-Huong Vo, Helen Leung, Gian Marco Farese, Rachel Thompson, Lauren Sadow, Jan Hein, Wendi Xue, and Reza Arab.

2.4 Key Studies and Themes

The following identifies some NSM research themes and key studies.

Cultural key words. This term refers to important words that function as focal points in culturally-shaped ways of thinking, acting, feeling, and speaking (Wierzbicka 1997). In some cases, they rise to public attention and may become iconic of whole cultures, but often they remain below conscious awareness, even as entire cultural discourses are built around them (Levisen and Waters

2017). Cultural key words are often found among words for emotions, values, ethnophilosophical and religious concepts, and ethnopsychological constructs. Classic NSM studies have examined English *happiness* and *evidence*, German *Angst* "fear, anxiety", Chinese *xiào* "filial piety", Danish *hygge* "cosy sociality", and Russian *duša* "soul", among others.

Cross-cultural semantics and pragmatics. Many NSM studies are contrastive. Often they deal with cross-cultural miscommunication. The most influential work is Wierzbicka's (2003) *Cross-Cultural Pragmatics*. Monographs include Gladkova (2010) on Russian cultural semantics, Levisen (2012) on the Danish universe of meaning, Wong (2014) on Singapore English, Tien (2015) on Chinese musical concepts, Bromhead (2018) on landscape terms, and Farese (2018a) on address terms in Italian and English.

Cross-linguistic (contrastive) lexical semantics. Many studies have delved into the lexical semantics of verbs (especially physical activities and speech acts), nouns (natural kinds, artifact words, kin terms, body parts, and collective nouns), adjectives (emotion, color, shape, and evaluation). Books include Wierzbicka (1992, 1996, 1999), Goddard and Wierzbicka (2014), Goddard and Ye (2016), and Ye (2017).

NSM metalanguage studies. These have been undertaken by numerous authors, usually appearing in large collections such as Goddard and Wierzbicka (2002) and Goddard (2008). There have also been studies focusing on particular primes, e.g., Farese (2018b), and whole metalanguage studies, e.g., Peeters (2006) on Romance languages, Vanhatalo et al. (2014) on Finnish.

Lexicogrammar. Wierzbicka was one of the pioneers of lexicogrammar. In her *The Semantics of Grammar*, she wrote: "There is no such thing as 'grammatical meaning' or 'lexical meaning'. There are only grammatical and lexical MEANS of conveying meaning—and even here no sharp line can be drawn between them" (Wierzbicka 1988: 8). Aside from several classic chapters in Wierzbicka (1988), major studies include Goddard (2010, 2015) and Wierzbicka (2009a, 2009b).

Cultural and historical semantics of English. Book-length studies include Wierzbicka's (2006) *English: Meaning and Culture*, Bromhead's (2009) *The Reign of Truth and Faith*, about aspects of 16th-century English, and Wierzbicka's *Experience, Evidence, Sense: The Hidden Cultural Legacy of English* (2010) and *Imprisoned in English*: *The Hazards of English as the Default Language* (2014). Aside from its inherent interest, an important impetus for this research has been to de-naturalize the English language by demonstrating its cultural and historical shaping.

3. Critical Issues and Topics

3.1 Semiotic Priority of (Meta)language over Diagrams and Data Visualizations

Many varieties of Cognitive Linguistics make heavy use of diagrams (image schemas, integration networks, semantic maps, Cognitive Grammar schemas) as representational devices. Although diagrams can be very helpful, in the NSM view it is essential to keep in mind that no diagram is semiotically self-contained. Any diagram needs verbal support. Even a circle with an "X" inside it does not in and of itself stand for the meaning INSIDE, although it may serve to represent that concept once it has been linked with words like "Inside" or "Container Schema". Most Cognitive Linguistics diagrams are much more complex than this. Sometimes they rely on general, but culture-specific iconography, e.g., the symbol —> to indicate movement or connection. Other times they employ purpose-built icons, such as • to represent 'tendency to rest' (in Talmy's Force Dynamic diagrams), or technical captions, such as TR (for 'Trajector'). Expert practitioners, who can read these diagrams fluently, are prone to forget how opaque they are for the uninitiated. The point is that when one looks at a diagram and "sees" meaning in it, one is always depending on certain interpretive conventions which can only be stated in words. Diagrams do not cancel the logical necessity for cognitive linguists to confront, theorize, and justify their choice of metalanguage.

The same applies to data analysis visualizations as used in "distributive semantics" to summarize the associations between words in massive bodies of texts. Until and unless they are interpreted into words, visualizations are merely summaries of quantitative distributional data. This issue is not a problem which is specific to linguistics, but a general semiotic problem turning on the relationship between quantitative (i.e., number-based) data and qualitative (i.e., concept-based) interpretation. One cannot assign meanings, describe concepts, or identify categories—let alone discuss them—except in some language. The question is: In what language or metalanguage? In whose language or metalanguage?

3.2 Against Technical Terms for Representing Thoughts and Meanings

Many linguists freely use technical or semi-technical terms to represent the content of people's everyday thinking as expressed in language; or, to put it another way, linguists often produce an analysis framed in technical terms and assert that it represents speaker cognition. They apparently see no paradox, no epistemological gap, in representing people's thinking in terms which are obscure or even unrecognizable to the people concerned. In the NSM view, this is inconsistent with the Cognitive Linguistic commitment to cognitive realism. It is always preferable to represent people's thinking using words which are known to them. To say this is not to deny the value of technical terms for describing aspects of linguistic form (providing such terms can be defined clearly), but not for modeling people's thoughts.

Already over 300 years ago, Leibniz made a similar point when he argued against technical terms in philosophy. Many philosophical subjects, he wrote, "occur commonly in the utterances, writings and thoughts of uneducated people and are met with frequently in everyday life". As a result, they can be spoken about in words that are familiar, natural, and economical. "When such words are available, it is a sin to obscure matters by inventing new and mostly more inconvenient terms …" In mathematics, physics, and mechanics, he allowed, new terms are necessary, but in fields which are "open to the understanding of all, we can rarely hope for anything but obscurity to result from inventing new terms in them" (Leibniz 1989/1690: 125–126).

3.3 Prototypes and Polysemy

Prototypes and polysemy are both widely used notions in Cognitive Linguistics, and rightly so. In each case, however, the NSM position is somewhat distinctive. As for prototypes, the NSM approach rejects the widespread dichotomy between prototypes and semantic invariants, arguing that a prototype can be part of the semantic invariant itself. Many NSM explications incorporate prototypes of different kinds.

As for polysemy, one of the advantages of the NSM system is that it provides a procedure for operationalizing the traditional distinction between semantic generality, on the one hand, and polysemy, on the other. A word can be said to have a single general meaning if its range of use can be covered by a single explication, i.e., by a single non-circular paraphrase. Conversely, a word is polysemous if two (or more) related explications are necessary. Paraphrase into semantic primes thus provides a litmus test for distinguishing between semantic generality and polysemy.

3.4 Terminology Traps in Linguistics

The NSM approach sees a pressing need to achieve greater clarity and consensus about linguistic terminology, especially with common terms such as "actor", "process", "possession", "relative clause", "reciprocal", and so on. The best way forward is to try to identify a semantic/conceptual prototype for each such term, described in simple, cross-translatable words. This can be used as a

standard point of reference; e.g., for "actor": 'someone did something'; for "process": 'it happened like this for some time'. If it is impossible to identify a single semantic/conceptual prototype, the category should be abandoned or replaced with a composite. For example, Goddard and Wierzbicka (2019) advocate replacing the grammatical meta-category "possession" with the composite Ownership-Body-Kin (OBK), each part of which can be given a semantic prototype. Re-orienting grammar description in this way would help build rapprochement between Cognitive Linguistics and linguistic typology (comparative grammar).

3.5 Semantic/Conceptual Molecules in Cognition

Semantic molecules (introduced in section 1.3) are packages of meaning, encapsulated in words, that function alongside semantic primes as building blocks of meaning. This section expands on this uniquely NSM concept and backgrounds current research.

The first point is that there are molecules within molecules, reflecting semantic dependencies between concepts of differing levels of complexity (see Figure 5.4). This architecture enables the mind to hold and manipulate huge amounts of conceptual content.

Research suggests that some semantic molecules are likely to be found with precisely the same conceptual makeup in all or most languages, betokening shared human experience. Equally, however, there are aspects of shared human experience that are not associated with any strictly universal words. 'Eat' and 'drink', for example, are not strictly universal because some languages use one verb to cover both activities, and in others the semantic boundary between them is drawn differently from English (Newman 2009). Even so, it can hardly be doubted that the nearest equivalents to 'eat' and 'drink' are semantic molecules in any language. Such examples are termed "approximate" universal molecules. A sample of proposed precise and approximate universal molecules is given in Table 5.2.

There are also language/culture-specific semantic molecules, which are tied to local geography, history, or culture. They can be extremely important to the lexical structure of their respective

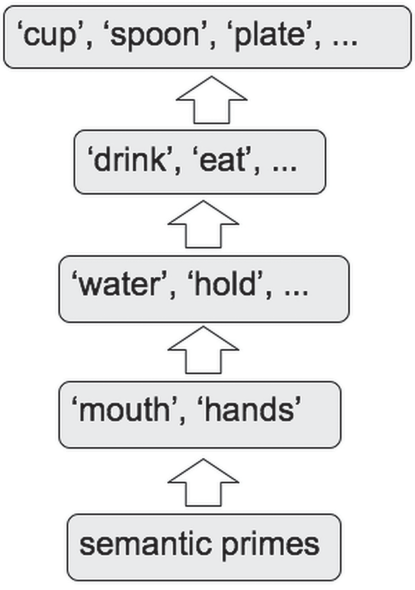


Figure 5.4 How complex concepts are successively built up from simpler ones
Source: Goddard 2018b.

Table 5.2 Samples of proposed precise and "approximate" universal semantic molecules

UNIVERSAL. Body parts: hands, legs, head, eyes, ears, mouth, nose, skin, fingers, teeth, bone, blood, breasts, face. Physical: long, round, flat, hard, soft, sharp, heavy. Physical-spatial: be on (something), at the top, at the bottom, in the middle, around, in front. Environmental: the sky, the sun, the ground, the earth, during the day, at night; fire, water, light. Biological: creature, grow (in ground). Materials: wood, stone. Biosocial: children, men, women, be born, mother, father, husband, wife. Social: we, be called, know someone. "Doing": lie, sit, stand, sleep, breathe, hold, play, laugh, sing, make, kill.
APPROXIMATE. "Doing": eat, drink, build. Life forms: bird, fish, tree. Biological: seeds, grass, flower, egg, dog. Human life: house, village/town, family, ill, sweet, soul, king/chief. Tools: knife, axe. Environment: river, sea, mountain/hill, forest.
Source: Goddard 2018b.

languages and to habitual ways of thinking in their respective cultures. The "literacy-related" molecules 'read', 'write', and 'book', for example, are important in many concepts related to modern life, as are the molecules 'number', 'money', and 'God'. Many culture-specific molecules are not confined to a single language or culture, but are found across a broad cultural area.

Some commentators have expressed the fear that the theory of semantic molecules may "open the floodgates" to arbitrariness, due to the temptation to posit molecules willy-nilly to save time and effort. The danger is real, so it is essential to emphasize that whether a word is or isn't a semantic molecule can only be determined by careful analysis, not just of a few words but of a large number of interrelated words. First impressions can be misleading. For example, linguists often refer to English *punch*, *slap*, and *kick* as "verbs of hitting" and native speakers sometimes volunteer paraphrases like '*punch* = hit with the fist'. Yet Sibly (2010) shows that 'hit' is not needed as a molecule in explications for these verbs and that English *hit* actually contains some semantic components that make it unsuitable for this purpose. In addition, words for 'hit' are known to vary greatly across languages.

4. Current Contributions and Research

This section presents a heterogeneous sampling of recent NSM work. The focus is on the metalanguage and its uses.

4.1 Cultural Pragmatics and Ethnopragmatics

Farese (2018a) proposes explications for a range of salutations and terms of address in English and Italian. Following Wierzbicka (2003), he argues against the widespread view that such interactional formulas are "purely pragmatic" and lack semantic meaning. Explications of interactional formulas are special, however, on account of their "I-you" structure and in how they are tied to the moment of speaking. Farese stresses that such formulas express a speaker's professed intentions and attitude towards an addressee at the moment of speech. He proposes the following as a general semantic template, likely to be applicable for many languages: (a) WHAT I WANT TO SAY TO YOU NOW, (b) WHY I WANT TO SAY IT, (c) HOW I WANT TO SAY IT, (d) HOW I THINK ABOUT YOU WHEN I SAY IT, and (if required) (e) WHAT I FEEL WHEN I SAY IT. This is the template that sits behind explication [A] below, for English *Hi!*

Many details of explication [A] are fine-tuned to match the distributional and implicational peculiarities of *Hi!*, as compared, for example, to English *Hello* and *Good morning*, and also to Italian *Ciao!* Of general interest, however, are the introductory lines of section (b). Here the phrasing 'I

want to do something like people often do when it is like this: …' captures the idea of performing a ritualized linguistic behavior appropriate to a particular prototypical context.

[A] *Hi (John, Mr. Smith, Professor, *Your Majesty)*
- a. I want to say something good to you now
- b. I want to say it because I want to do something like people often do when it is like this:
  - they can see someone somewhere for a short time
  - they can say something to this someone during this time
  - they couldn't say something to this someone for some time before
- c. I want to say it in a very short time
- d. when I say it, I think about you like this: "this someone is someone like me"

As mentioned, Farese (2018a) also proposes explications for several other similar formulas, including Italian *Ciao!*, and although space prohibits going over these in any detail, a couple of points can be noted. First, both explications involve the speaker's professed wish to briefly say something good to the addressee, conventionally appropriate to having just seen them, and to express the attitude at that moment 'I think about you like this: "this someone is someone like me"'. The explication for *Ciao!*, however, also includes two extra components: 'when I say this, I think about you like I can think about someone if I know this someone well' and 'when I say this, I feel something good towards you'. These components give a sense of how social meanings, such as those usually described as "solidarity", "familiarity", and "warmth", can be depicted in the NSM metalanguage.

4.2 Semantics of Landscape Terms

Bromhead (2018) presents a set of semantic studies of landscape terms, i.e., words like English *mountain*, *river*, *desert*, and *meadow*, in cross-linguistic perspective. Her analyses bring out many subtle differences between the meanings of apparently equivalent terms in different languages (including English, French, Spanish, and Pitjantjatjara), but here we focus on a subtle difference within English, namely, that between *coast* and *shore*. The example has historical importance for Cognitive Linguistics since it was used by Fillmore (1982: 121) to make the point that even "referential" nouns are not mere labels, but can reflect different perspectives or points of view. Fillmore's observation was that whereas both words are about the boundary between land and water, *coast* is somehow "from the land's point of view", whereas *shore* is "from the water's point of view".

Bromhead (2018: 103–104) notes further that *coast* can only be used in relation to the sea and that the word denotes a large or very large area. *Shore*, on the other hand, can be used also about rivers and lakes and denotes a much narrower area. She proposes explications [B] and [C] (slightly adjusted). Both include anthropocentric components about what people can see from one side of the place in question. (Note that in these and subsequent explications, molecules are marked [m] on their first use only.)

[B] *the coast* (English)
- a. a place of one kind
- b. many places where people can live are parts of this place
- c. all these places are near the sea [m]
- d. people can see the sea on one side of these places

[C] *the shore* (English)
- a. a place of one kind
- b. this place is very near some places where there is a lot of water [m]

c. these places where there is a lot of water are on one side of this place
d. when people are in these places where there is a lot of water, they can see this place
e. sometimes there can be water in this place

Components (b)–(c) of explication [B] account for the broad area denoted by the word *coast*, whereas the lack of such components in explication [C] for *shore*, together with it being located 'very near' the water, implies a smaller and narrower area. The final component of [C] allows the presence of some water on *the shore* itself, as with tides and water lapping or edging onto a sandy shore.

4.3 Specialized Constructional Semantics

Goddard (2015, 2018a: ch. 8) develops an account of semantically specialized verbal constructions. A key aspect of the analysis is to first identify and explicate the basic sense of a verb, which includes its core arguments and inherent aspect, a prototypical scenario (which often includes a motivation), and other details of event structure, such as manner and the outcome or potential outcome. The basic sense is then available as a [d] element in explications for extended uses and specialized constructions using the same verb.

This concept can be illustrated with a verb much discussed in Cognitive Linguistics, namely, English *climb* (Goddard 2020a). When used without directional modification, it implies upward motion, but it can also be used with the adverb *down*, and with other directional modifiers. Fillmore (1982) famously argued that *climb* prototypically signals two semantic components (moving upward and 'clambering' manner), but that in extended uses either one of these components can be set aside.

Goddard's analysis of the basic sense of *climb* is more elaborate than that implied by Fillmore, involving a prototypical motivation (roughly, 'I want to be at the top of this big thing after some time'), willingness to put in effort and awareness of risk, as well as manner and potential outcome components. In sentences like *He climbed down the tree*, however, the prototypical motivation is overridden by a specific motivation triggered by the directional adverb, while the actor is described as doing something 'like someone does when this someone is climbing [d] something', i.e., in a manner component. See [D] below.

[D] *He climbed down the tree* (ladder, wall).
a. he did something in a place at this time — LEXICOSYNTACTIC FRAME
b. it happened like this: — HOW IT HAPPENED
a short time before, he thought like this about something in this place (a tree, ladder, wall): — – motivation
"I want to be at the bottom [m] of this tree (ladder, wall)"
c. because of this, he did something for some time — – manner
like someone does when this someone is climbing [d] something
d. because of this, after this, he was not in the place where he was before — OUTCOME
he was at the bottom of this tree (ladder, wall) as he wanted

The same analytical strategy works when *climb* appears with other adverbials, e.g., *He climbed onto the roof of the car*, *She climbed into bed*, *The child climbed out onto the window sill.* In each case the motivation component is "fed", as it were, by the directional phrase and the basic sense 'climb [d]' is deployed in a manner component. For example, for *He climbed onto the roof of the car*, the motivation component includes the thought: 'I want to be on the roof of this car'. The manner component is the same as (c) above.

A similar approach can be used for verbs in English-specific constructions that are sometimes termed "valency alternations"; for example, *cut* in an "Accidental Body-part Damage"

construction like *I cut my hand on the broken glass.* The explication includes an outcome component as follows: 'something happened to my hand like something happens to something when someone is cutting [d] it'. The [d] element is here used to describe an "analogy of effect", rather than manner.

In short, the use of the [d] mechanism in combination with the semantic prime LIKE is a simple but versatile way to incorporate analogical extension into NSM explications.

4.4 Semantics of Christian Concepts and Beliefs

In recent years Anna Wierzbicka has been much focused on the explication and exegesis of Christian religious concepts and beliefs (Wierzbicka 2019, 2020, in press). Not only has this produced a new body of NSM-based writing at the intersection of semantics and theology, it has also seen new uses of the NSM metalanguage and its cousin Minimal English (see section 5.2). This section sketches these developments with reference to the concept of 'God'.

Based largely on Wierzbicka (2019), [E] presents an attempt to explicate the shared invariants of meaning of the word *God* in the Judeo-Christian tradition.[4] The explication is composed entirely in semantic primes and portmanteaus of primes, such as 'always' and 'everything'. Essentially, it presents God as a unique being who is eternal, omnipresent, all knowing, and good.

[E] *God* (a semantic explication)
- a. someone
- b. this someone is not like people
- c. this someone is above people, this someone is above everything
- d. this someone is good, not like anyone else can be good
- e. this someone is now, this someone always was, this someone always will be
- f. this someone is everywhere, this someone knows everything
- g. there is no one else like this someone

The reader now is invited to consider the extract in [F] below. This is taken not from an explication, but from what may be termed a "belief script": Wierzbicka's (in press) attempt to unpack the understanding of 'God' in the Nicene Creed, a text which is professed by countless Christians on a regular basis. (The Nicene Creed was originally agreed upon, in its Greek version, at two great councils of the Christian church in the 4th century.) As one would expect, the proposed belief script has many shared components with explication [E], but there are also several striking differences in structure and in content. These can be seen in extract [F], which is drawn from the final part of the script.

[F] *God* (extract from a "belief script" for the Nicene Creed)
[…]
- f. we [m] can think about God like this:
  "God is above us people, God is above everything"
- g. at the same time, we can all think like this:
  "I can speak to God; when I speak to God, God hears me"
- h. we can know that it is like this:
  God loves [m] us people; God knows [m] us; we live because God wants this

The first difference is the use, in the first lines of (f), (g), and (h), of the newly proposed universal semantic molecule 'we' (Goddard & Wierzbicka, 2021). This usage models the "collective stance" of those who profess the Creed.[5] The second difference is the actual content expressed in (g) and (h). This is intended to capture Christian beliefs about God which, Wierzbicka contends, had stabilized over the first centuries after Jesus's death.[6]

The most radical difference, however, is Wierzbicka's decision to use the language-specific (albeit pan-European) verb 'to love' in the expression 'God loves [m] us people' in the final line—even though this verb expresses a meaning which is not readily translatable into many languages outside Europe. The decision rests on her argument that the verb 'to love', with its very general meaning, has itself grown out of the Christian tradition and is integral to the Christian understanding of God (Wierzbicka 2020). Hence, it must be included if the goal is to model Christian belief "from the inside".

5. Future Directions

5.1 New Theory Developments

One new development in NSM theory is the notion of lexicosyntactic molecule. The basic idea is that some semantic primes can appear in grammatical constructions which are decomposable but which nonetheless function as chunks in the explications of other concepts. Essentially, the prime-in-construction functions like a semantic molecule. To date, this idea has only been fully worked through in relation to the so-called "that-complement" of KNOW (Wierzbicka 2018a; Goddard 2020b); it is likely, however, that some other grammatical frames in the metalanguage which are presently regarded as basic and irreducible will also turn out to be "molecular".

5.2 Minimal English and Other Minimal Languages

Because NSM research is conducted using words of ordinary language, it lends itself to real-world applications. In past years these applications were mainly in language teaching and intercultural education. Recent times have seen the development of Minimal English and other minimal languages (Goddard 2018a, 2021; Sadow, Peeters, & Mullan 2020). Minimal English refers to radically simplified versions of English designed, usually in collaboration with non-linguists, to be clear and cross-translatable but also adapted to the needs of particular user groups. In developing and popularizing minimal languages, NSM researchers are taking their work "out of the lab" and into the public space.

Minimal languages have applications in language teaching (Bullock 2012–2020; Sadow 2019) and language revival (Machin 2021), science communication and health care (Wierzbicka 2018b; Marini 2018), development training (Caffery & Hill 2019), use with people with autism (Jordan 2017) or cognitive impairments, and in other spaces where clear and accessible communication is essential.

5.3 Discourse Semantics

A future horizon for NSM research is discourse semantics. Three examples will have to suffice. One is Wierzbicka's (in press) use of belief scripts for unpacking the content of key Christian texts. Forbes (2020) proposes a set of semantic texts to capture shared beliefs and attitudes underpinning the discourse community of parents of autistic children. Hein (2020) combines NSM analysis with conceptual blending theory to give an account of the discursive construction of Argentina as a "European" nation in South America. In all these cases the NSM metalanguage and/or Minimal English are used, not for explicating words or constructions, but for modeling the contours and "grooves" of discourse.

Notes

1 Despite these relationships, it remains true that neither prime can be paraphrased in terms of the other. For example, GOOD ≠ 'not bad', BAD ≠ 'not good'. Although 'Y happened AFTER X' may be logically equivalent to 'X happened BEFORE Y', there is an irreducible difference in perspective between the two.

2 This is available at [intranet.secure.griffith.edu.au/schools-departments/natural-semantic-metalanguage/downloads] and at [nsm-approach.net]. Other useful resources there include a list of 150 canonical sentences for identifying NSM semantic primes in different languages, and tables of semantic primes in 20+ languages.
3 Phrases and lines of semantic text are often called 'components', but there is little similarity between the NSM approach and classical structuralist Componential Analysis.
4 Arguably, there are at least two different understandings of 'God' in the Judeo-Christian tradition, e.g., the God of the Hebrew Bible and God as "re-understood" in the New Testament. Explication [E] may be viewed as an attempt to capture a common lexical meaning that is compatible with both.
5 Goddard and Wierzbicka (2021) argue that 'we' plays a critical role as a semantic molecule in the lexical semantics of "collective" concepts such as 'nation', 'community', and 'team'.
6 In the final line, 'know' is marked as a semantic molecule because this is not the semantic prime KNOW, but a complex polysemic meaning 'know (someone)'; cf. Farese (2018b).

Further Reading

Bromhead, H. (2018). *Landscape and culture—Cross-linguistic perspectives*. Amsterdam: John Benjamins. (Semantic studies of landscape terms with an experientialist and culture-sensitive orientation.)
Goddard, C. (2018). *Ten lectures on Natural Semantic Metalanguage: Exploring language, thought and culture using simple, translatable words.* Leiden: Brill. (Covers the history, theory, practice, and application of the NSM approach in an informal lecture style.)
Peeters, B., Mullan, K., & Sadow, L. (Eds.). (2020). *Studies in ethnopragmatics, cultural semantics, and intercultural communication: Meaning and culture.* Singapore: Springer. (A varied set of studies of words as carriers of cultural meaning in many widely different languages.)
Wierzbicka, A. (2014). *Imprisoned in English: The hazards of English as a default language*. New York: Oxford University Press. (Critiques the increasing conceptual Anglocentrism of social science and humanities and shows a research-based way forward.)
Ye, Z. (Ed.). (2017). *The semantics of nouns*. Oxford: Oxford University Press. (State-of-the-art research on the semantics of nouns across many conceptual domains and in many languages.)

Related Topics

cognitive semantics; construction grammar and frame semantics; concepts and conceptualization; cognitive pragmatics; cognitive linguistics and linguistic typology; culture in language and cognition

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6
WORD GRAMMAR

Richard Hudson

1. Introduction

Word Grammar (WG) was one of the first theories to embody the assumption that knowledge of language is just ordinary knowledge applied to words:

> the view for which I shall argue in this book is that the linguistic network is just part of a larger network, without any clear difference between the linguistic and non-linguistic beyond the fact that one is about words and the other is not.
>
> *Hudson 1984: 6*

This assumption, which has been expressed pithily as "knowledge of language is knowledge" (Goldberg 1995: 5), is arguably the most important defining feature of cognitive linguistics (CL), so WG sits very comfortably within the CL family of theories, alongside others such as Cognitive Grammar and the various manifestations of Construction Grammar.

In developing this assumption WG makes a number of quite specific claims about how the mind works. The most important cognitive assumptions of WG are the following (Hudson 2007: ch. 1, 2010: pt. 1):

- Networks: The only units that cognition recognizes are concepts connected to one another in a single (enormous) symbolic network. A concept's properties are its links to other concepts, so these links define the properties and labels are superfluous (Lamb 1998: 59).
- Concepts and concept-creation: Concepts are nodes in the network where at least two connections meet, indicating the coincidence of these properties; so, whenever a new combination of properties is recognized, a new node must have been created to register this combination. For example, a word token is a distinct concept from the type of which it is a token.
- Inheritance and the 'isa' link: Concepts are organized in a loose taxonomy whose links are all of the same type, called 'isa' (as in *English is a language*). This relationship permits default inheritance so generalizations allow exceptions. In WG, default inheritance is monotonic (i.e., inherited properties never need to be revised) because it only applies as part of the process of concept-creation.

- Relational concepts: All relations are typed, and most types are part of the general taxonomy of concepts, where they are called 'relational concepts'. New relational concepts can be created freely, so the taxonomy of relational concepts is as open-ended as that of entity concepts.
- Primitive relations: A small number of relation-types are primitives. One such is the 'isa' relation; others are 'argument' and 'value' (for the relational concepts) and 'quantity', which defines the number of tokens that we might expect in experience; for instance, '0' is for something impossible, false, or non-existent, and '_' is for something which is possible.
- Learning: Apart from the primitives of the system, all concepts are learned from experience. Learning follows two paths. On the one hand, some tokens of experience become permanent records of the event concerned, thereby permanently enriching the network; and on the other hand, our minds can spot generalizations and create new super-categories to express them.

To make these principles more concrete, let us consider a non-linguistic example and how we might present it in a WG diagram. Imagine that Mary has a brother Tom. What must she know? The answer, according to Figure 6.1, includes the following:

- A typical person (of either sex) may have a brother, shown by the small box labeled 'a'. Node *a* is linked to the person by a concept 'brother', whose elliptical box shows it to be a relational concept in contrast with the rectangular boxes for the entity concepts; as a relational concept it has an argument ('person') and a value ('a'), which are distinguished by the arrow head on the value link.
- Node *a* isa 'male', with a small triangle for the isa relation. Similarly, *a* has the quantity '_', meaning any quantity; in this case the quantity relation is indicated by '#' on the arrow. From these two links we know that the brother is male, but optional.
- 'Female' and 'male' are two subtypes of 'person', so each isa the supercategory.
- Mary herself isa female, and she has a brother, Tom. The isa link from 'brother' down to the small circle 'b' shows that this link is an example of the 'brother' link, so Tom, being male, is eligible for the role. In his case, however, he is not optional but actual, so his quantity is '1'.
- The node labeled 'Tom*' is a particular instance of Tom as witnessed on some occasion, e.g., when he fell over. Mary created this new node in order to record the uniqueness of this event, but in the process of creation it inherited all Tom's permanent properties such as being her brother and being actual. These inherited properties are shown by dotted lines.
- Normally the node for a particular instance will be forgotten, but if Mary remembers the incident, Tom* will turn into a permanent node, still carrying an isa link to 'Tom'.

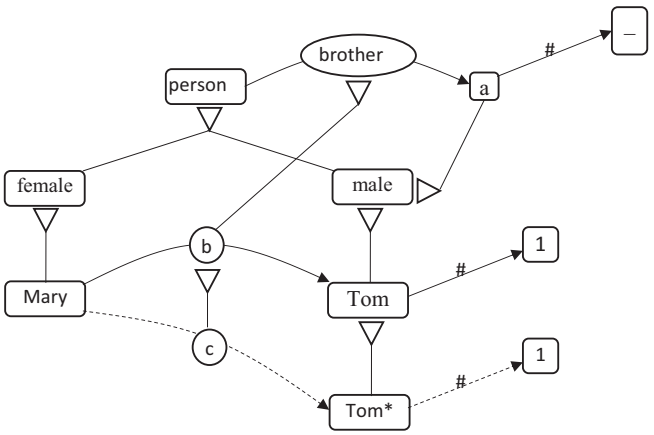


Figure 6.1 Mary and her brother Tom

The claim of WG is that diagrams like this are an accurate representation of what a person must know; so every node and every link can be justified by the available evidence from introspection and common experience. The diagram also illustrates the cognitive assumptions listed earlier about networks, concepts and concept creation, inheritance and isa, relational concepts, primitive relations, and learning.

The point of this introduction has been to flesh out the general claim that language is just an example of general cognition. The general claim of WG is that all these abilities are available to a language learner and a language user, and that no other abilities are needed. The rest of this chapter addresses some of the research questions of linguistics, showing how these assumptions answer them.

2. The Continuum of Generality

From the assumptions just outlined it follows that since language is knowledge, it must be a network. Many would agree that the lexicon is a network, and others would agree that the grammar is a network of constructions, but this claim goes further: everything in language is expressed as a network of atomic nodes (Lamb 1966, 1998). The entire grammar is a network, including syntax as well as morphology, and the nodes in a network are not internally complex structures such as constructions or lexical items, but atomic nodes, with no internal structure at all. Moreover, all labels are redundant, like the comments in a computer program; they help the analyst to keep track of the analysis, but all the information in the network is carried by the links (and, ultimately, by links to sensory data and motor processes which are outside the network).

The theory is called Word Grammar because the word is the central unit—and the only unit for morphology and syntax—so we start with the network for a typical lexeme: BOOK. This is an abstraction which brings together a form (the morpheme {book}) and a meaning (the concept 'book') by having both of these things among its properties; and, thanks to an isa link, it also belongs to a category (common noun). This very simple analysis is shown in Figure 6.2.

The evidence for these links comes from priming experiments which show that another word can 'prime' an example of BOOK—i.e., make it easier to retrieve—if the other word is similar either in its meaning (e.g., *newspaper*) or in its form (e.g., *booking* or even *hook*). These effects make sense only if the meaning and form are carried by network links, so if they were separated from the network by a structure such as a construction, the explanation would fail.

For all its simplicity, this analysis has major implications for the overall architecture of language. Most obviously, it undermines any attempt to separate 'grammar' and 'lexicon'. In this model, there is just a single 'lexicogrammar'—a term borrowed from Systemic Functional Linguistics (Berry 2019)—whose units are arranged in a tall taxonomy ranging from the most general unit,

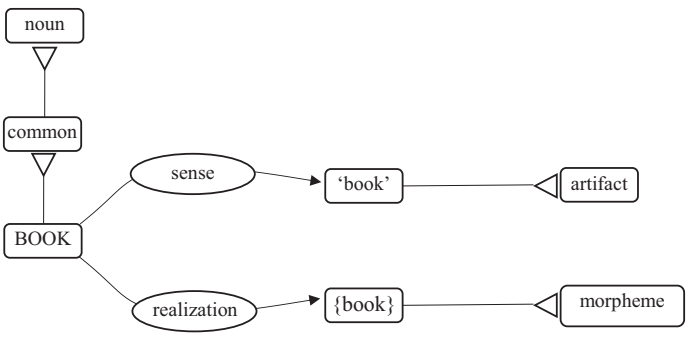


Figure 6.2 The lexeme BOOK

'word', down to a particular token of a lexeme. This unified view of grammar and lexicon is widely accepted in CL (Geeraerts & Cuyckens 2007: 14), but the WG taxonomy takes it much further by adding further points in the continuum.

Starting at the top, words themselves exemplify even more general categories such as 'symbol' or 'action'. Like other symbols, a word has an author and an addressee; and like actions, a word has an actor, a purpose, a time, and a place (Hudson 1984: 242). These properties are what permit WG to analyze the social context, as explained briefly in section 7.

In the middle of the taxonomy we find not only lexemes but also sub-lexemes, particular ways of using a lexeme. The sub-lexemes of BOOK would certainly include its use in the phrase *by the book*, as in (1), where it means 'according to the relevant rules'.

(1) He did it by the book.

In this case, the sub-lexeme combines the syntactic property of being used with *by the* with the semantic property of having this particular meaning. A convenient way of labeling sub-lexemes is to add an indicative subscript such as $BOOK_{by\text{-}the}$. This mechanism accommodates the specialized constructions of Construction Grammar (Hudson 2007: 151–157).

At the foot of the taxonomy, we find not only specific tokens of the word (such as the token at the end of example (1)), but even sub-tokens. For example, any deliberate repetition is an attempt to produce another token which inherits the properties of the model, so in (2) the second example of *book* isa the first, which means that we can describe it as a sub-token.

(2) He did it by the book—a book which he himself had written.

This even taller taxonomy now locates the lexicogrammar in a much broader analysis which undermines another popular distinction, that between competence and performance. Linguistics generally accepts Chomsky's distinction (also known as I-language versus E-language) as a given, with linguistics responsible for knowledge (or the underlying language system) but not for the behavior of people applying that knowledge. However plausible this distinction may seem, it actually turns out to be very unclear because knowledge doesn't just define the generative rules, but also includes the representations generated. If a representation of a sub-token is inherited from the permanent knowledge via isa links, as claimed in WG, then performance is just a transient fringe at the foot of the permanent network of competence. The situation is presented in Figure 6.3, where the conventional categories are indicated on the right (but without any attempt to indicate boundaries between them).

To summarize, then, the lexicogrammar is part of the vast web that we call 'knowledge'. It can be defined as the area within this network that deals with words (including their phonology, which isn't shown in the examples); but this area has no natural border that separates it from the rest of knowledge.

3. The Continuum of Abstractness

Cutting across the taxonomy of generality we find a very different continuum, which includes the traditional analytical levels of linguistics—phonetics, phonology, morphology, syntax, semantics, and pragmatics, ranging from the most concrete (phonetics) to the most abstract (pragmatics). This continuum is mainly handled in WG by a single relationship, 'realization', whereby a more abstract element is made more 'real' by a more concrete pattern. Thus, the lexeme BOOK is realized by the morpheme {book} which in turn is realized by the phonological syllable / bʊk /, which is realized phonetically by a certain combination of gestures in the speech tract. These realization facts are part of the stored lexicogrammar, and can easily be analyzed as links in a network.

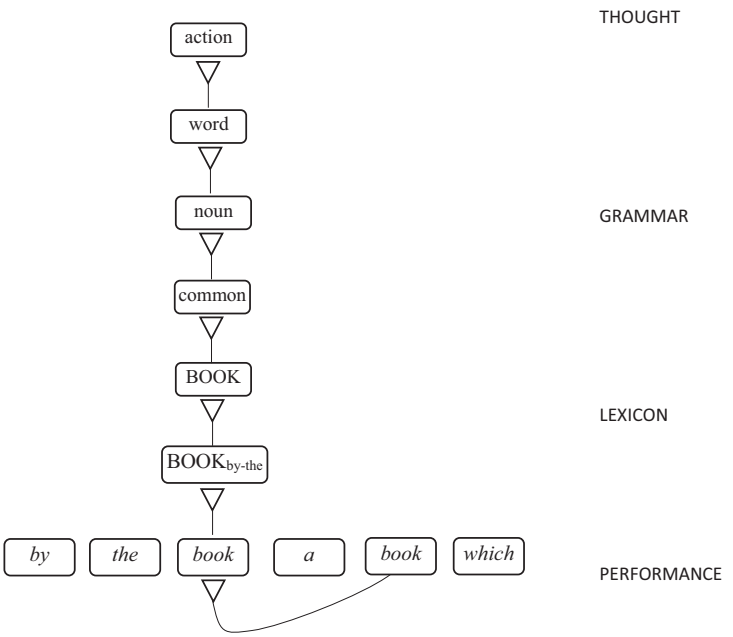


Figure 6.3 The continuum from thought to performance

It is less clear that realization is the relevant relation between words and their meanings. Meanings are standardly divided into sense and referent, so in (3) the sense of the word *book* is the general concept 'book', while its referent is the concept of the particular book in question.

(3) I bought the book.

While it may be reasonable to say that the concept 'book' is realized in English by the lexeme BOOK, it would be very odd to say the same for the particular book. For one thing, the word *book* is no more real than the book itself; and for another, this relationship is not stored in memory, but calculated pragmatically. In short, we don't expect categories and objects to have a name (an associated word); but we do know that the typical word has a sense and a referent, so WG treats both sense and referent as properties of a word. In this analysis, the word has a central role as a watershed between meaning and realization, as shown in Figure 6.4.

This hierarchy of more or less abstract concepts fits comfortably into CL because it emphasizes the close connections between language and other parts of the conceptual system. For instance, if the sense of a word is a concept, and words themselves are concepts, then metalanguage is easy to explain as words whose senses happen to be words. For example, the form *book* in (4) is the name of the lexeme, a freshly created word whose referent is also a word; and in the present sentence we have a second-order creation: a word referring to a word which refers to a word (Hudson 1984: 246–247, 2010: 221).

(4) *Book* contains four letters.

On the other hand, this analysis also challenges one of the basic assumptions of some theories in the CL family: that "grammar is an inventory of *signs*—complexes of linguistic information that contain constraints on form, meaning and use" (Michaelis 2013: 132).This definition of grammar seems to claim that every unit of grammar, including morphemes, combines form with meaning.

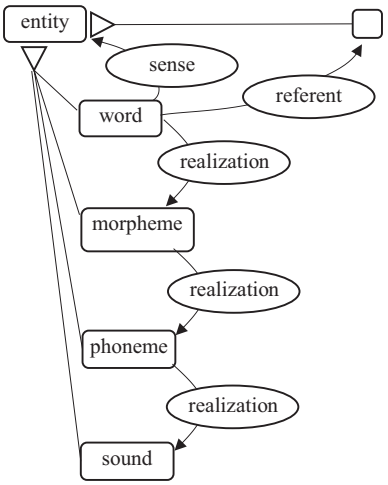


Figure 6.4 From meanings via words to realizations

This is very different from the WG model in Figure 6.4, which makes this claim only for words, with morphemes mediating between words and phonology but having no direct link to meaning.

There are at least three reasons for preferring the WG model. First, a very familiar observation in introductions to morphology is that the segmentation of a word may have much more to do with its formal relations to other words than with its meaning. For example, the verbs *receive*, *deceive*, *perceive*, and *conceive* can all be segmented to reveal a shared morpheme {ceive} which explains why their corresponding nouns and adjectives replace this by {cept} to give {ception} and {ceptive}, but no one would suggest that there must be an element of meaning shared by these verbs. Secondly, there is good psycholinguistic and neurolinguistic evidence that listeners identify potential morphemes even when a word is semantically opaque (Brooks & Cid de Garcia 2015; Fiorentino & Fund-Reznicek 2009), which means that these morphemes have no meaning; for instance, the opaque *bellhop* (meaning 'hotel porter') primes *bell* almost as strongly as the transparent *teacup* primes *tea*, in contrast with *penguin*, which does not prime *pen* at all. The third reason is the existence of folk etymology, which reveals our desire to interpret difficult new words in terms of simpler familiar words even when there is no semantic similarity. A classic example is the English word derived about 1600 from the Spanish word *cucaracha*, which was reanalyzed as made up of our morphemes *cock* and *roach*, which had similarities of form but absolutely no semantic link. (At that time, a roach was just a kind of fish.)[1] In short, these morphemes were imported without any meaning, showing that a meaningless morpheme is possible.

4. Morphology

The idea that morphology might be modeled as a network has been developed fully in Network Morphology (Brown & Hippisley 2012), which offers a very similar analysis to the WG approach. The leading idea in both theories is that morphological similarities between words can be expressed as static relations rather than as dynamic processes—in other words, WG morphology is constraint-based. So instead of saying that an English adjective can be turned into a noun by adding {ness}, the grammar says that an English adjective may have a nominalization which consists of the adjective's stem followed by {ness}. The crucial elements are the lexical relations (e.g., 'nominalization', the relation between a word and the noun derived from it) and the morphological relations, notably 'part', or more specifically, 'part 2'. These relations can easily be presented in a network diagram

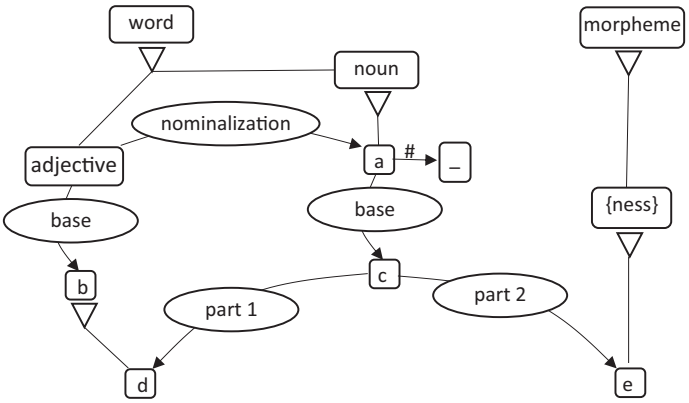


Figure 6.5 Adjective + {ness} = Noun

Table 6.1 Latin first-person singular verbs: 6 tenses, 4 conjugations

	first conjugation	*second conjugation*	*third conjugation*	*fourth conjugation*
present	{portā} {ō}	{docē} {ō}	{trah} {ō}	{audi} {ō}
future	{portā} {ēb} {ō}	{docē} {ēb} {ō}	{trah} {am}	{audi} {am}
imperfect	{portā} {ēb} {am}	{docē} {ēb} {am}	{trah} {ēb} {am}	{audi} {ēb} {am}
perfect	{portā} {v} {ī}	{docē} {v} {ī}	{trah} {ks} {ī}	{audi} {v} {ī}
future perfect	{portā} {v} {er} {ō}	{docē} {v} {er} {ō}	{trah} {ks} {er} {ō}	{audi} {v} {er} {ō}
pluperfect	{portā} {v} {er} {am}	{docē} {v} {er} {am}	{trah} {ks} {er} {am}	{audi} {v} {er} {am}

as in Figure 6.5. In prose, a typical adjective has a nominalization *a* which is optional (its quantity # is unspecified) and which is a noun. If the adjective's base is *b*, then *a*'s first part is a copy *d* of *b*, while its second part *e* is a copy of the morpheme {ness}.

Inflectional morphology uses the same machinery but the relations can be much more complex because they involve interactions between multiple inflectional features (e.g., tense, voice, person, number) and purely morphological classes (Gisborne 2019; Hudson 2007, ch. 2). For example, consider the Latin verb forms for use with first-person singular subjects displayed in Table 6.1. Every form shows person and number in its last morpheme; e.g., by {ō} (e.g., *port-ō*, 'I carry'), {am}, or {ī}. But the person/number morpheme may follow up to two other morphemes signaling the tense; for instance, *port-āv-er-ō* means 'I will have carried'. The details also vary with the 'conjugation'—the morphological class of the stem morpheme, where {portā} is said to belong to the first conjugation, in contrast with {docē}, 'teach', {trah}, 'drag', and {audi}, 'hear', illustrating three other conjugations. The complexities are simplified here by ignoring a number of morphophonological details; for example, the sequence {docē} {v} {ī} is actually pronounced (or at least spelt) *docui*, and {portā} {ō} is *portō*.

A particularly relevant fact emerges from the table: that the choice of morpheme for first-person singular is influenced both by the verb's tense and by the immediately preceding morpheme. Specifically, it is {ō} by default, but:

- {am} in an imperfect verb or a pluperfect (which might be better named 'imperfect perfect'): *portābam*, etc., *portāveram*, etc.
- {am} in a future verb when immediately after a third- or fourth-conjugation base: *traham*, *audiam*.
- {ī} after a perfect suffix: *portāvī*, etc.

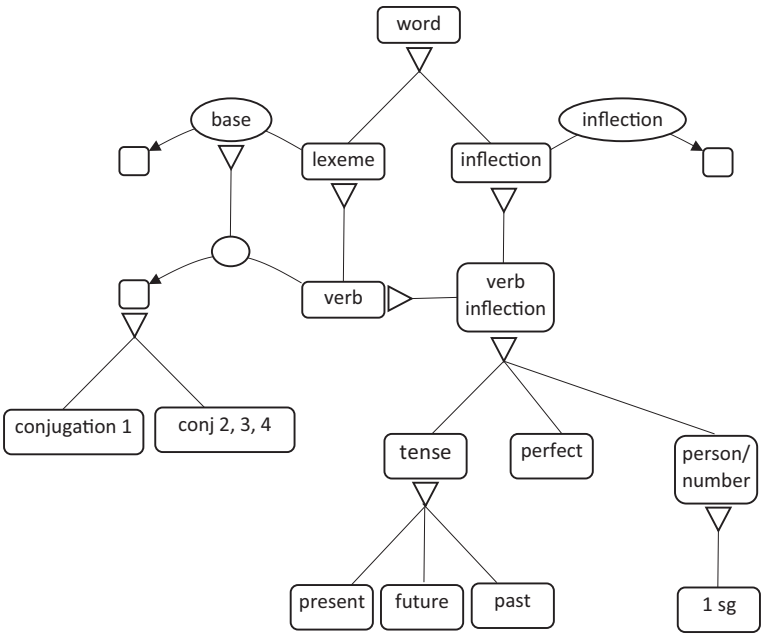


Figure 6.6 How to classify Latin verbs in WG

Similarly, the marker of perfect is {v} by default, but {ks} (and other morphemes) next to a third-conjugation base. This is a classic network arrangement, where influences converge from different sources. To illustrate the benefits of a network analysis, consider the first-person future of *trah*, which is *traham*.

The first challenge is to represent the morphosyntactic properties 'first-person singular' and 'future'. The solution is shown in Figure 6.6, which distinguishes lexemes (further classified as noun, verb, and so on) from inflections, and then brings them together in 'verb inflection'. A particular inflected verb inherits its base from the lexeme and its inflection (the fully inflected form) from the inflectional classification. The base morpheme is assigned to a conjugation class (but this classification does not apply to the whole word, which is why it has no impact on syntax or semantics). The inflectional categories include the traditional classification in Table 6.1, but with some reorganization.

Figure 6.6 provides the context for the morphological rules which account for the choice of morphemes in *traham*, 'I will drag', classified as both future and first-person singular, with a third-conjugation base. The relevant rules are these:

- Every future verb has a tense marker related to it by 'tm', which by default is {ēb} (though, exceptionally, it is {er} after a perfect marker).
- But immediately after a third-conjugation base, the future marker is merged with the person-number marker (related by 'pnm').
- When a marker of the first-person singular is next to a third- or fourth-conjugation stem, it is {am} instead of the expected default {ō}.

These rules translate into the network in Figure 6.7, where the defaults for both the person-number marker and the tense marker are overridden if the marker concerned is immediately next to a third- or fourth-conjugation base. The relation between adjacent items is 'next', and is indicated in this diagram (and later) by a solid arrow.

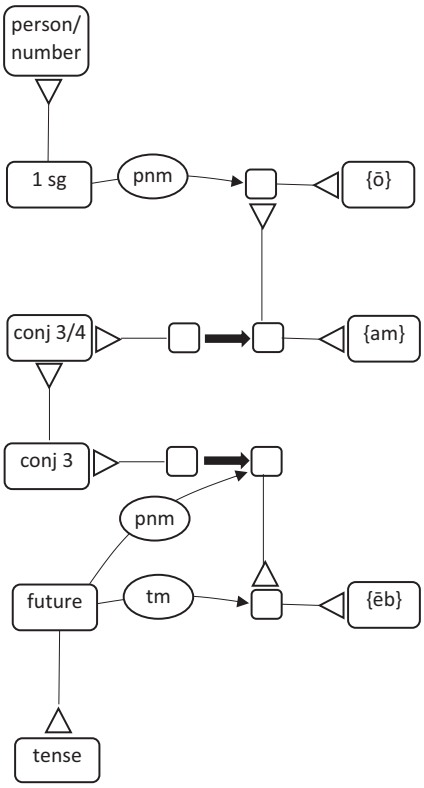


Figure 6.7 The Latin rules for using {am} instead of {ēb} {ō}

These rules conspire to generate the correct morphological structure for *traham*, 'I will drag', as shown in Figure 6.8.

The reason for dwelling at length on this small sample of data from Latin is to demonstrate that the apparatus of WG can give an insightful analysis even to a complex problem of morphology, which might be seen as the area of language which is most distant from everyday thought and behavior. Admittedly the network structures are complex even when presented in stages, but the claim of WG is that they are a true reflection of the networks in the mind of anyone who knows Latin; so if our networks are complicated, so are those built by anyone learning Latin.

5. Syntax

The most controversial characteristic of WG is probably its treatment of syntax, where it follows the dependency tradition rather than the mainstream tradition of phrase structure (Hudson 1984: 75–82). As mentioned in section 2, the theory's name reflects the centrality of the word and the absence of larger units. The word is the meeting point between morphology (the internal structure of the word) and syntax (its external structure), but it is also the only unit in sentence structure (though for some purposes strings of words are also recognized (Hudson 1990: 404–408)). In dependency grammars, sentences certainly have structure, but this is based on the dependencies between pairs of individual words rather than on the part-whole relation between words and phrases. For example, in the sentence *Small babies cry*, WG recognizes a subject dependency between *cry* and *babies*, and *babies* is separately related by another dependency to *small*, but the sequence *small babies* is not recognized as a noun phrase.

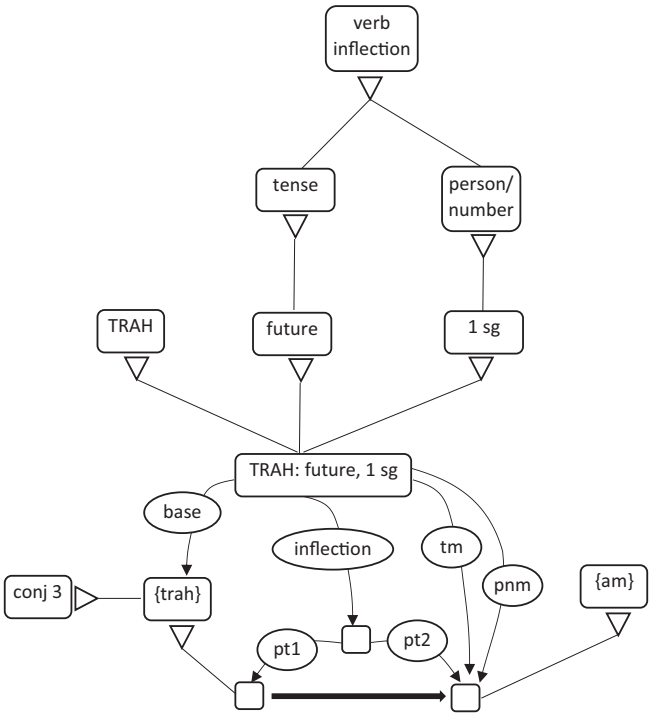


Figure 6.8 A network for *traham*, "I will drag"

There are a number of reasons for CL supporters to prefer the dependency approach. For one thing, it is closer to the structures that we recognize outside language, where we frequently relate individual people directly without feeling obliged to create a larger unit to carry this relationship; for instance, Tom and Harry can be friends without thereby constituting a 'friendship pair'. If this is possible outside language, why not inside as well? Another objection to phrase structure is its very doubtful intellectual history. The American tradition stems from Bloomfield's 1933 constituent structure, which in turn was based on an analysis proposed in 1900 by the psychologist Wundt in which every constituent was a proposition containing a subject and a predicate—an analysis that nobody in modern CL would entertain (Percival 1976). This very brief history (less than a century old) contrasts with more than a thousand years of analysis in terms of word-word dependencies based on psychologically plausible notions such as government and modification (Percival 1990).

A third attraction of the dependency approach is that it opens the way to treating syntactic structure as a network (like the rest of cognition), freed from the limitations of tree structures. Modern syntax provides ample evidence for networks; for example, when a subject is 'raised', it serves as the subject of two or more words, an arrangement that is easy to capture in a network but hard in a tree. If syntactic structure really is a network, then the natural notation is not a tree but a collection of labeled arrows (where the arrows point from a word to its dependents). Figure 6.9 shows two WG syntactic diagrams, the first showing a simple (though controversial) structure and the second a more complex one. In these diagrams, each arrow shows a dependency, and the labels distinguish subjects, complements, adjuncts, and predicative complements.

One of the attractions of dependency analysis for CL is the ease with which it can be related to theories of processing, and in particular to the limits on working memory. If we think of syntactic processing as essentially concerned with finding head-dependent pairs, then it is easy to see that each dependency, linking two words, imposes a burden on working memory from the first

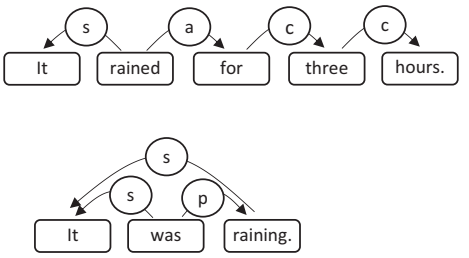


Figure 6.9 Dependency structures for two sentences

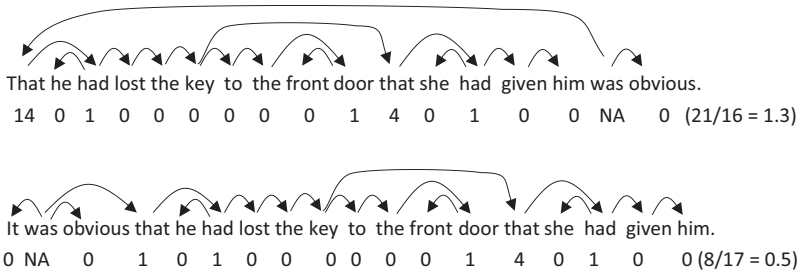


Figure 6.10 Measuring dependency distance

word to the second word. This means that a long dependency (measured in terms of the number of intervening words) is more of a burden than a short one. This rather simple and obvious idea has generated a lively research agenda in corpus linguistics, in bilingualism studies, and in experimental psycholinguistics (Duran Eppler 2011b; Levy, Fedorenko, Breen, & Gibson 2014; Liu, Xu, & Liang 2017). A simple demonstration of the principle comes from extraposition in English in sentence-pairs like (5) and (6), where extraposition makes processing a great deal easier.

(5) That he had lost the key to the front door that she had given him was obvious.
(6) It was obvious that he had lost the key to the front door that she had given him.

The bare structures in Figure 6.10 show the very long dependency from *was* back to *that* in (5) which is missing in (6). The calculations on the right give the mean dependency distance, a measure of the memory load, which explains why everyone agrees that the extraposed version in (6) is so much easier to read, in spite of being more complex.

WG dependency structures are much richer than the structures recognized by most dependency grammarians. We have already seen one example of this richness in the structure for the raised subject in *It was raining*, where *it* depends on both *was* and *raining*, in contrast with more typical dependency structures which only allow one head per dependent.

Another example lies in the treatment of word order, where WG combines dependency structures with ordering relations. Since networks obviously have no left-right dimension, the only way to show ordering is by means of a dedicated system of relationships. The WG solution invokes Langacker's 'Landmark' relation (Langacker 2007) inside grammar (as well as elsewhere in cognition) and combines it with a property called 'position': a word has a landmark and a position which is defined relative to the landmark (either before or after, < or >). By default, a word's landmark is its head—the word on which it depends—and its position is either before or after this head. In addition, once the words have been linearized each one is related to the next by the relation 'next' which

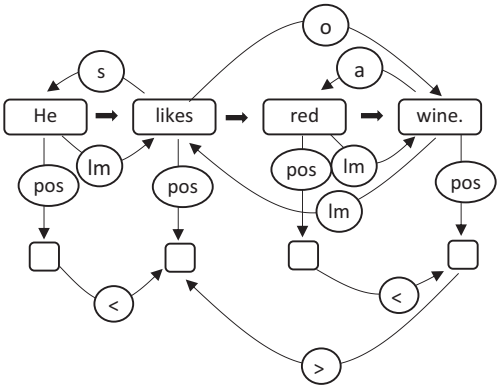


Figure 6.11 Predicting the order of words

was introduced earlier and is shown in diagrams by a solid horizontal arrow. A useful convention locates all the dependencies above the words and their positional relations below, so a simple example would be the diagram in Figure 6.11 for *He likes red wine*. Word order is also constrained by a general Principle of Landmark Transitivity which applies outside language and which guarantees the same continuous phrases as phrase structure (Hudson 2007: 139).

In WG, syntax is probably the most fully developed area of the theory and has been applied to a wide range of phenomena, ranging from the tiny, e.g., the gap in English where we expect the word *amn't* (Hudson 2000), to the general, e.g., gerunds (Hudson 2003, 2007, ch. 4) and pied-piping (Hudson 2018). In every case, the analysis proposed uses nothing but the machinery of ordinary non-linguistic thinking.

6. Semantics

WG theory also includes a theory of how we interpret words and sentences semantically (Hudson 2007, ch. 5). The basis of this theory is the distinction between sense and referent (mentioned in section 3), but unlike some other semantic theories, WG regards both the sense and the referent as mental constructs; so if the word *dog* refers to Fido, then its referent is the concept of Fido, rather than Fido himself (Hudson 1984: 138). This approach has the advantage of giving the same conceptual status to the sense and the referent: both are concepts. And typically we assume that the referent isa the sense, so if we hear *the dog*, we look in our minds for an example of a dog. Admittedly metaphor and other tropes provide exceptions, but this is the default arrangement.

Another somewhat unusual claim of WG is that every word, and not just nouns, typically has both a sense and a referent (Hudson 1990: 134–138). For example, a verb also has both, and indeed a verb's sense and referent may be the same as those of a noun; so the noun ARRIVAL has a sense which is identical to that of the verb ARRIVE, and both may have the same referent as in (7).

(7) When he arrived, his arrival caused a great stir.

In this example, both *arrived* and *arrival* have the same sense, which we might label 'arriving', and both refer to the same example of arriving.

The compositionality of meaning is very easy to express in a dependency analysis, because by default each dependent creates a new meaning for its head word by enriching it. For example, if *big* depends on *book*, the semantic result is the concept 'big book' which isa 'book', the ordinary sense of the lexeme BOOK. But what, precisely, is the relation between these two meanings and

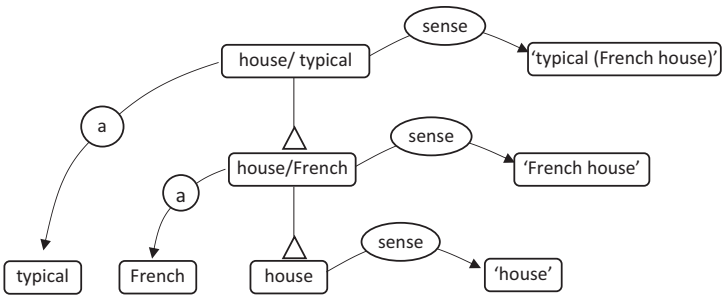


Figure 6.12 Typical French house with sub-tokens

the word *book*? If 'book' is its sense, what about 'big book'? Whatever answer we give, the analysis must link 'big book' to the dependent (*big*) which created it. The WG solution is to invoke sub-tokens, which were introduced in section 2 as an analysis for repeated tokens. Here the same logic can apply to a single occurrence of a word whose properties change as a result of modification. In the case of *big book*, this approach would distinguish two different sub-tokens:

- *book* as first recognized, with the sense 'book' inherited from BOOK.
- *book/big*, a sub-token of *book* reflecting the presence of *big*, and with the sense 'big book'.

This solution respects compositionality by linking complex meanings to the relevant syntax, but it also solves the problem of scope which is illustrated by the example *typical French house*, where *typical* takes not *house*, but *French house*, as its scope; i.e., it means 'a house which is typical of French houses', not 'a house which is both typical and French' (Dahl 1980; Hudson 1980). Such examples challenge standard dependency analyses, because the sequence *French house* is not a unit in such analyses. The WG analysis is shown in Figure 6.12.

WG semantics also addresses familiar logical challenges. For example, universal and existential quantification are easily handled by the logic of default inheritance: if something is true of all examples of X, then it is represented as a property of X which will automatically be inherited by all examples; but if it is true only of one example, then this example is represented by a separate node with an isa link to X, and the property is not included among those inherited from X. But of course, unlike standard logic, default inheritance accommodates exceptions, so it allows loose universal quantification—universals with exceptions. This is much more relevant than classical logic to natural language where it is common to combine generalizations with exceptions (e.g., *Everyone passed except Tom*).

Another logical facility comes from the 'quantity' relation, whose value distinguishes obligatory (1) from impossible (0). This applies to referents, so *no student* has 'student' as its sense but '0' as the quantity of its referent; moreover, as explained earlier, verbs also have referents in WG, so the quantity '0' can also be used to indicate sentential negation. Thus in (8), the sense of *didn't* (the root word) is 'I saw her' but its referent has the quantity 0, indicating non-existence.

(8) I didn't see her.

Similarly, in (9) the network allows two different semantic structures according to whether the students wrote jointly or severally, and in the latter interpretation it projects the numbers of students and essays up to the quantity of the top referent, which shows that the total number of incidents in which a student wrote an essay was 2*3.

(9) Two students wrote three essays.

Alongside these network analyses of the meaning of grammatical patterns, WG networks can also be applied to lexical semantics. A very general issue in lexical semantics is the nature of the descriptive vocabulary; the WG position is that every concept is defined by its relations to other concepts, so existing concepts are recycled in the definition of later ones (Hudson & Holmes 2000).

One particularly well developed area of lexical semantics is the English verbs of perception (SEE, HEAR, FEEL, SMELL, TASTE, and related verbs such as LOOK and SOUND) which form a tightly linked cluster of embodied concepts which relate to the different modes of perception and ways of perceiving (Gisborne 2010). WG analyses have also been offered for a large number of verbs and prepositions (Holmes 2005; Hudson 2008a); in many cases these analyses explain the verbs' syntax, but inevitably some arbitrariness remains (Hudson, Rosta, Holmes, & Gisborne 1996).

7. Social Context

One consequence of integrating language into general knowledge is that a spoken word receives a representation which includes all its deictic properties—its speaker and addressee, its time, its place, and its purpose. This provides a firm foundation for analyzing the familiar areas of deictic semantics—tense, person, and so on—but also helps with pragmatic function. To take a simple example, the sense of an imperative is the purpose of its speaker. For example, when I utter (10), my purpose is the event defined as you coming in (Hudson 1984: 189).

(10) Come in!

Clearly the state of mind of the speaker and addressee are crucial to a great deal of semantics—not least the semantics of emotive expressions such as (11).

(11) What on earth do you mean?

A further major benefit of being able to include speakers in the analysis is the door that this opens to sociolinguistic analysis, whether in the area of social dynamics (e.g., in the choice of names or personal pronouns for the addressee) or in quantitative dialectology (Hudson 1996, ch. 7).

Note

1 www.merriam-webster.com/words-at-play/folk-etymology/cockroach

Further Reading

The theory of WG is nearly 50 years old, so it is not surprising that it has evolved in reaction to challenging ideas and data. These changes can be traced through a series of book-length treatments, each of which tries to summarize the then current state of play (Hudson 1984, 1990, 2007, 2010). Other books have applied WG to lexical semantics (Gisborne 2010, forthcoming), to grammaticalization (Traugott & Trousdale 2013), and to the study of bilingual code-switching (Duran Eppler 2011a). There are also articles and chapters about particular issues which may be of interest to readers of this volume:

- language variation and change (Adger & Trousdale 2007; Gisborne 2011, 2017; Hudson 1997b, 1997a, 2013; Trousdale 2013)
- constructions and idioms (Gisborne 2008, 2011; Holmes & Hudson 2005; Hudson 2008b; Hudson & Holmes 2000; Trousdale 2013)

- clitics (Camdzic & Hudson 2007; Hudson 2017)
- language teaching (Hudson 2008c)

Related Topics

cognitive semantics; cognitive grammar; construction grammar and frame semantics; cognitive pragmatics

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7

THE CREATIVITY OF NEGATION

On Default Metaphorical, Sarcastic, and Metaphorically Sarcastic Constructions

Rachel Giora

1. Introduction

1.1 The Creativity of Negation

Negation often functions as an attenuator rather than a suppressor (Giora 2006, 2007; Giora, Balaban, Fein, & Alkabets 2005; Giora, Heruti, Metuki, & Fein 2009; Giora, Jaffe, Becker, & Fein 2018). As such, it prompts ***default*** automatic interpretations, not least metaphorical (Giora, Fein, Metuki, & Stern 2010) and sarcastic (Giora, Givoni, & Fein 2015), even when outside of context and even if what is said is true or devoid of explicit figurative cues such as semantic anomaly (Beardsley 1958), which prompts metaphoricity, or internal incongruity (Partington 2011), which prompts sarcasm.

Consider the following examples (1–3)[1] below. They illustrate default negative metaphorical interpretations (1), default negative sarcastic interpretations (2–3), alongside nondefault alternative counterparts:

(1) You are not my mom.
Default **metaphorical** interpretation: 'Stop treating me like a kid'.
Nondefault compositional (here **literal**) interpretation: 'Another person is my mom'.
(2) He is not the most inspiring person around.
Default **sarcastic** interpretation: 'He is boring'.
Nondefault compositional (here **literal**) interpretation: 'Others are more inspiring'.
(3) She is not the most sparkling drink in the pub.
Default **sarcastic** interpretation: 'She is boring'.
Nondefault compositional (here **metaphorical**) interpretation: 'Others are more engaging'.

1.2 The Defaultness Hypothesis

1.2.1 How Is Degree of Defaultness Determined?

According to the Defaultness Hypothesis (Giora et al. 2015, 2018), the automatic, preferred interpretation of a stimulus, as determined by participants' ratings when items are presented in isolation, is defined as its default, preferred interpretation; its less-preferred interpretation is defined as its

nondefault alternative. This is true even when responses are constructed rather than accessed directly from the mental lexicon. Degree of defaultness, then, is determined when stimuli are displayed outside of context.

1.2.2 How Is Degree of Defaultness Defined?

Within the framework of the Defaultness Hypothesis (Giora et al. 2015), defaultness is defined in terms of an unconditional, automatic response to a stimulus. However, for an automatic response to be favored by default, utterances must meet the conditions for default interpretations which guarantee that potential ambiguity between literal and nonliteral interpretation is allowed a priori so that a preference is allowed.

For a preference to be allowed a priori, items should be:

(a) unfamiliar—novel, noncoded—so that they would be constructed on the fly rather than accessed directly from the mental lexicon;
(b) free of internal cues such as semantic anomaly (as per Beardsley 1958) or internal incongruity (as per Partington 2011), which prompt nonliteralness; and
(c) free of external cues which might affect interpretation outputs such as specific contextual information (e.g., Gibbs 1994), intonation (e.g., Woodland & Voyer 2011), or discourse markers (such as low-salience markers; see Givoni, Giora, & Bergerbest 2013).

According to Giora et al. (2015, 2018), stimuli, involving strong attenuation (by means of negation or rhetorical questions) of highly positive concepts (*S/he is* ***not the most inspiring person around***),[2] if meeting conditions (a–c) for defaultness (specified above), will be interpreted sarcastically by default ('S/he is dull'). Hence, when in equally strong contexts, supportive of their sarcastic interpretation, they will be processed faster than nondefault, nonattenuated (yet sarcastically biased) affirmatives (*S/he is the most inspiring person around*).

Indeed, in Giora et al. (2015), this has been shown to be true, irrespective of other factors known to affect processing, such as equal degree of novelty (Giora 1997, 2003), equal degree of non/literalness (Grice 1975), or equal strength of contextual support (Gibbs 1994).[3]

2. Experimental Studies: Testing the Predictions of the Defaultness Hypothesis

2.1 Predictions Regarding Negative Metaphors and Non-Metaphorical Affirmative Counterparts

According to the Defaultness Hypothesis,

(1) outside of a specific context, certain negative constructions (*You are not my mom*) will be interpreted **metaphorically by default**; their affirmative counterparts (*You are my mom*) will be interpreted **literally by default**;
(2) when in equally strong, supportive contexts, negative constructions will be processed faster in metaphorically than in literally biasing contexts; and
(3) when in natural discourse, its production will unfold via reflecting or resonating with default (here, metaphorical) interpretations.

Examples (4)–(7) below illustrate both default (metaphorical) and nondefault (literal) interpretations of **negative** items (of the form 'X is not Y') presented in isolation, followed here by their various interpretations (see also Giora et al. 2013):

(4) **I am not your maid.**
Metaphorical interpretation: 'Don't expect me to serve you'.
Literal interpretation: 'Someone else is your helper'.

(5) **I am not your mom.**
Metaphorical interpretation: 'Don't expect me to take care of you'.
Literal interpretation: 'Someone else is your mom'.

(6) **You are not a pilot!**
Metaphorical interpretation: 'Stop driving so fast'.
Literal interpretation: 'You were not trained to fly a plane'.

(7) **This is not Memorial Day.**
Metaphorical interpretation: 'No need to be so sad'.
Literal interpretation: 'We are not celebrating Memorial Day today'.

2.1.1 Experiment 1: Negative Constructions and Affirmative Counterparts Presented in Isolation

Experiment 1 tested prediction 1, expecting certain negative constructions (see (4)–(7) above) to be interpreted metaphorically by default; their affirmative counterparts are expected to be interpreted literally by default (Giora et al. 2010). Indeed, participants' ratings, on a 7-point metaphoricity scale, showed that, outside of context, novel negative constructions (*You are not my boss*, meaning 'Don't tell me what to do'), meeting conditions (a–c) for defaultness, were rated as significantly more metaphorical than their affirmative counterparts (*You are my boss*, meaning 'I work for you'; 'I am your employee') (M=5.50, SD=0.96, M=3.48, SD=1.27); $t_1(47)=10.17$, $p<.0001$, $t_2(14)=4.36$, $p<.0005$. These results established the defaultness of the metaphorical interpretation in the negative and the defaultness of the literal interpretation in the affirmative.

2.1.2 Experiment 2: Processing Speed of Negative Metaphors and Literals Embedded in Equally Strong Biasing Contexts

Experiment 2 tested prediction 2, expecting negative constructions (*You are not my boss*) to be processed faster in metaphorically than in equally strong contexts, supportive of their literal interpretation. Results indeed showed that, when in equally strong, supportive contexts, novel negative constructions (*You are not my boss*), involving no semantic anomaly, thus meeting conditions (a–b) for defaultness, were processed significantly faster in metaphorically (M=880 msec., SD=246) than in literally biasing contexts (M=946 msec., SD=199), $t_1(37)=2.35$, $p<.05$, $t_2(14)=1.42$, $p=.09$.

Results, thus, confirm that, as predicted by the Defaultness Hypothesis (see prediction 1 above), outside of a specific context, negative items, meeting conditions (a–c) above for defaultness, are interpreted metaphorically by default; affirmative counterparts, meeting these very same conditions, are interpreted literally by default (see Experiment 1). Hence, as per prediction 2, when in equally strong contexts, supportive of their metaphorical or literal interpretations, novel **negative** constructions, meeting conditions (a–b) above for defaultness, are processed significantly faster in metaphorically than in literally biasing contexts (Experiment 2). Such results are unprecedented, challenging views and findings supportive of the predominance of strong contextual support (e.g., Grice 1975; Gibbs 1994).

2.2 Predictions Regarding Negative and Affirmative Sarcasm and Their Non-Sarcastic Counterparts

According to the Defaultness Hypothesis,

1. outside of a specific context, certain negative constructions, strongly attenuating highly positive concepts (by means of negation) (as in, S/he is **not the most engaging person around**), will be interpreted sarcastically by default (meaning 's/he is dull'); their affirmative counterparts will be interpreted literally by default (meaning 'others are more engaging'); hence,
2. when in equally strong contexts, supportive of their sarcastic interpretation, (a) negative constructions will be processed faster than affirmative counterparts; (b) they will also be processed faster than negative counterparts, embedded in literally biasing contexts;
3. when in natural discourse, its production will unveil via resonating with default interpretations.

Consider, for instance, corpus-based examples (8)–(9) below (see Giora et al. 2015, forthcoming). They illustrate both (default sarcastic and nondefault non-sarcastic) interpretations (whether literal or metaphorical) when presented in isolation. In addition, they are further followed by their nondefault counterparts. Note that example (9) is an Optimal Innovation, involving the same construction (strongly attenuating highly positive concepts);[4] example (10), however, conveys default *meanings* (both sarcastic and metaphorical), whether in or out of context, affected by the item's conventionalization:[5]

(8) **He is not the most talented kid in the kindergarten.**
Constructional sarcastic interpretation: 'He is stupid/far from being talented'.
Compositional (here, literal) interpretation: 'Others are smarter'.

(9) **George W. Bush in not the brightest jewel in the box.**
Constructional sarcastic interpretation: 'He is stupid/far from being smart'.
Compositional (here, metaphorical) interpretation: 'Others are smarter'.

(10) **He is not the sharpest pencil in the box.**
Coded constructional sarcastic *meaning*: 'He is stupid'.
Coded metaphorical (embodying a pencil) *meaning*: 'Others are smarter'.

2.2.1 Experiment 3: Rating Degree of Sarcasm of Negative Constructions and their Affirmative Counterparts when in Isolation

In Giora et al. (2013), we tested prediction 1, expecting negative constructions (*Ambitious she is not*) to be interpreted sarcastically when out of context; affirmative counterparts (*Ambitious she is yes*)[6] were expected to be interpreted literally under this very same condition.

As expected, results confirmed that, when in isolation, and followed by a 7-point sarcasm scale, novel negative constructions were rated as more sarcastic (M=5.88, SD=0.37) than their novel affirmative counterparts (M=2.63 SD=0.40); $t(17)$=45.55, p<.0001. Such results established sarcasm as the default interpretation of the negative constructions, and literalness as the default interpretation of the affirmative counterparts (see Giora et al. 2013).

2.2.2 Experiment 4: Processing Speed of Negative Sarcasm and Literalness Embedded in Strongly Supportive Contexts

In Giora et al. (2013) we tested prediction 2, expecting negative constructions, strongly attenuating highly positive concepts (e.g., *Ambitious she is not*), to be processed faster in sarcastically biased targets than in equally strong contexts, supportive of their literal interpretations. Results indeed

showed that sarcastically biased targets were processed faster (*M*=883 msec., *SD*=183) than equally strong, literally biased versions (*M*=949 msec., *SD*=234); $t_1(43)=1.75$, $p<.05$, $t_2(17)=1.20$, $p=.12$.

2.2.3 Experiment 5: Rating Degree of Sarcasm of Negative Constructions and their Affirmative Counterparts when in Isolation

In Giora, Drucker, Fein, & Mendelson (2015), we further tested prediction 1, expecting novel negative constructions, strongly attenuating highly positive concepts (e.g., *Punctuality is not her forte; Punctuality is not her distinctive feature*), to be interpreted sarcastically when in isolation. Their equally novel affirmative counterparts (e.g., *Punctuality is her forte; Punctuality is her distinctive feature*) were expected to be interpreted literally under this very same condition.

Results indeed showed that, as predicted, when out of context, novel negative utterances were rated as more sarcastic (*M*=6.05, *SD*=0.32) than their equally novel affirmative counterparts (*M*=2.75, *SD*=0.57); $t(13)=22.07$, $p<.0001$. Such results established the defaultness of negative sarcasm and that of affirmative literalness.

2.2.4 Experiment 6: Processing Speed of Negative Sarcasm and Negative Literalness when in Equally Strong Biasing Contexts

In Giora, Drucker et al. (2015), we tested prediction 2, expecting negative constructions (*Punctuality is not her forte; Punctuality is her distinctive feature*) to be processed faster in sarcastically than in equally strong, literally biased contexts.

Results indeed showed that, as predicted, when in equally strong biasing contexts, negative constructions were processed faster in sarcastically (*M*=1349 msec., *SD*=401) than in literally biased versions (*M*=1790 msec., *SD*=579); $t_1(43)=4.69$, $p<.0001$, $t_2(13)=4.48$, $p<.0005$. Additionally, there were spillover effects in the same direction, further attesting to the speed superiority of negative sarcasm over negative literalness (*M*=647 msec., *SD*=192; *M*=739 msec., *SD*=196); $t_1(43)=2.90$, $p<.0005$, $t_2(13)=1.94$, $p<.05$.

And although structural markedness might prompt sarcasm, negation would prove to be the determinant trigger. Negative versions of utterances will always be more sarcastic than their affirmative counterparts, regardless of degree of structural markedness. In Experiment 7 we therefore weighed marked against unmarked constructions.

2.2.5 Experiment 7: Rating Degree of Sarcasm of Marked and Unmarked Negative and Affirmative Constructions

Items included 16 concepts, each appearing in four different constructions, marked and unmarked:

(11) Marked constructions:
- Supportiveness is not her forte/best attribute
- Supportiveness is yes her forte/best attribute

(12) Unmarked constructions:
- Her forte/best attribute is not supportiveness
- Her forte/best attribute is yes supportiveness[7]

Results showed that such items were interpreted sarcastically by default, regardless of fronting: when presented in unmarked, non-fronted ordering, their negative versions were interpreted sarcastically; their affirmative counterparts were interpreted literally. Specifically, two 2-way ANOVAs showed

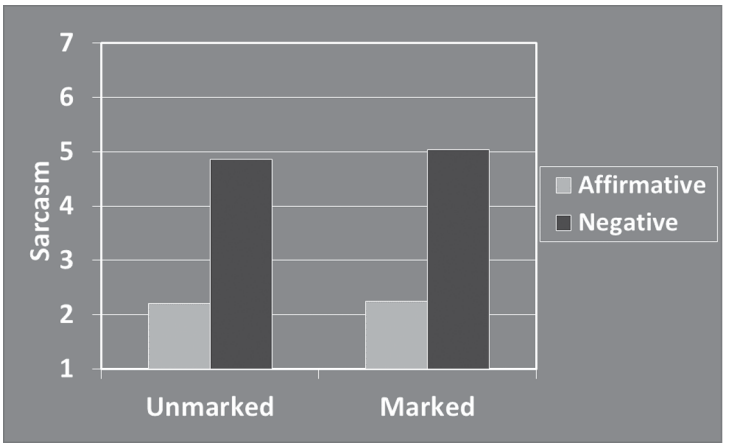


Figure 7.1 Rating degree of sarcasm of marked and unmarked negative constructions and their affirmative counterparts when in isolation

- a significant main effect of Negation $F_1(1,59)=128.87$, p<.0001, $F_2(1,15)=799.72$, p<.0001;
- no significant effect of Markedness $F_1(1,59)=1.80$, $p=.19$, $F_2(1,15)<1$, n.s.; and
- no Negation X Markedness interaction $F_1(1,59)<1$, n.s., $F_2(1,15)<1$, n.s.

As illustrated by Figure 7.1 above, markedness did not play a role in affecting sarcasm. Instead it is negation that makes a difference.

2.2.6 Experiment 8: Rating Degree of Sarcasm of Negative Constructions and their Affirmative Counterparts when in Isolation

In Giora et al. (2015), we further tested prediction 1, expecting negative constructions (*He is not the most organized student*) to be interpreted sarcastically when out of context; their affirmative counterparts (*He is the most organized student*), however, were expected to be interpreted literally under this very same condition. Results indeed showed that, when in isolation, negative constructions (*He is not the most organized student*) were interpreted sarcastically; rated significantly higher than the mid-point (4) on a 7-point sarcasm scale (M=5.55, SD=0.65); $t_1(19)=3.79$, $p<.001$, $t_2(11)=5.95$, $p<.0001$. Their affirmative counterparts (*He is the most organized student*) were interpreted literally; rated as significantly lower than the mid-point (4) on a 7-point sarcasm scale (M=1.72, SD=0.34); $t_1(19)=5.87$, $p<.0001$, $t_2(11)=12.91$, $p<.0001$.

In all, these results established the sarcastic interpretation as a default interpretation in the negatives, and the literal interpretation as a default response in the affirmatives.

2.2.7 Experiment 9: Processing Speed of Negative and Affirmative Sarcasm, and Negative and Affirmative Literalness, when Embedded in Equally Strong Biasing Contexts

In Giora et al. (2015), we tested prediction 2, expecting *negative* constructions (*He is not the most organized student*) to be processed faster than *affirmative* counterparts (*He is the most organized student*), when embedded in equally strong contexts, biased toward the sarcastic interpretation. Additionally, as per prediction 2, *negative* constructions (*He is not the most organized student*) were expected to be processed faster when embedded in sarcastically than in equally strong, *literally*

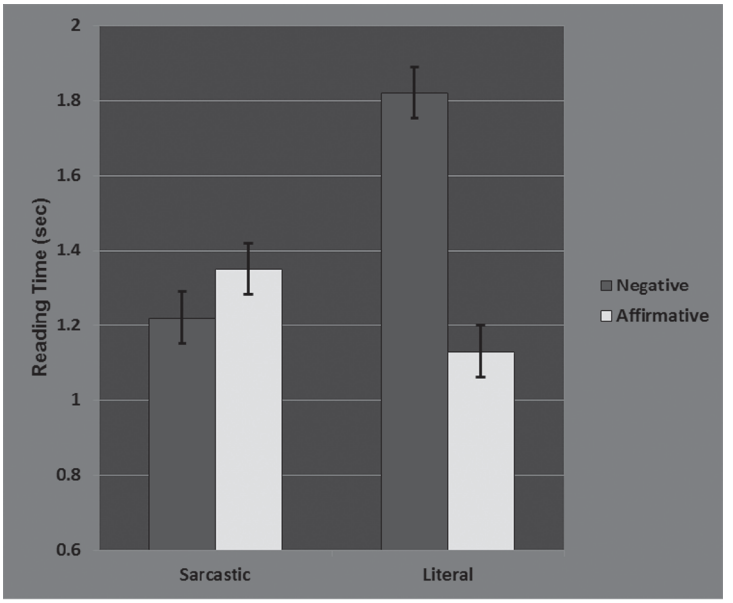


Figure 7.2 Results attesting to the speed superiority of **default** negative sarcasm over **nondefault** affirmative sarcasm and **nondefault** negative literalness

biasing contexts. **Default** negative sarcasm, then, is expected to be processed faster than **nondefault** ***affirmative sarcasm and*** **nondefault** ***negative literalness***.

As illustrated by Figure 7.2 (above), **default** negative sarcasm was faster to process than (a) **nondefault** affirmative sarcasm and faster than (b) **nondefault** negative literalness. (And although, as predicted by the Defaultness Hypothesis, **default** affirmative literalness was processed faster than **nondefault** negative literalness, this finding is irrelevant here, because it is not related to the creativity of negation).

As predicted by the Defaultness Hypothesis, results collected for items, embedded in contexts equally strongly supportive of either their literal or sarcastic interpretations, support the creativity of negation. They verify the predicted **superiority** of figurative constructions, **strongly attenuating highly positive concepts by means of negation**, over

(i) **nondefault nonattenuated** affirmative figurativeness

and

(ii) **nondefault** negative literalness.

Note that these results were further replicated by means of the eye-tracking technique (see, Filik, Howman, Ralph-Nearman, & Giora 2018) and the divided visual field paradigm (see Giora, Cholev, Fein, & Peleg 2018).

3. Corpus-Based Studies: Testing the Predictions of the Defaultness Hypothesis

3.1 Default Metaphorical Interpretations

In this section, prediction 3 is tested, expecting utterance contextual environment to unfold via echoing or resonating (as per Du Bois 2014) with default interpretations, thereby corroborating

online results (see also Giora, 2020; Giora, Drucker, & Fein 2014). First, the prevalence of the distribution of metaphorical interpretations of negative constructions and their affirmative counterparts should be established (Study 1). Then, discourse unfolding via contextual resonance with default (here) metaphorical interpretations of negative metaphors will be tested (Study 2).

3.1.1 Study 1: Testing the Distribution of the Metaphorical Interpretations of Negative Items and Their Affirmative Counterparts

Study 1 investigated the distribution of the metaphorical interpretations of negative items and their affirmative counterparts. Various corpora were searched (Google, Yahoo, Start, MSN, Walla, and Netex), allowing the harvesting of the first ~50 occurrences of the targets studied here in both their affirmative and negative versions. Results showed that in English, Russian, and German, the metaphorical interpretations were a lot more prevalent in the negative than in their affirmative counterparts (see Figures 7.3–7.5).

Results then attest to the pervasiveness of default metaphorical interpretations in the negative constructions and to their scarcity in the affirmative counterparts. Based on these results, we could move on to testing prediction 3, expecting discourse production to unveil via default interpretations.

3.1.2 Study 2: Testing Text Production, Unfolding via Resonance with Default Metaphorical Interpretations

Study 2 tested prediction 3, expecting the contextual environment of such negative items to echo and resonate with their default rather than nondefault interpretations.

To exemplify such discourse production, consider examples (13–14) below. In (13), *not nourishing food* reflects the default **metaphorical** interpretation of "not food"; in (14), *Your voice*

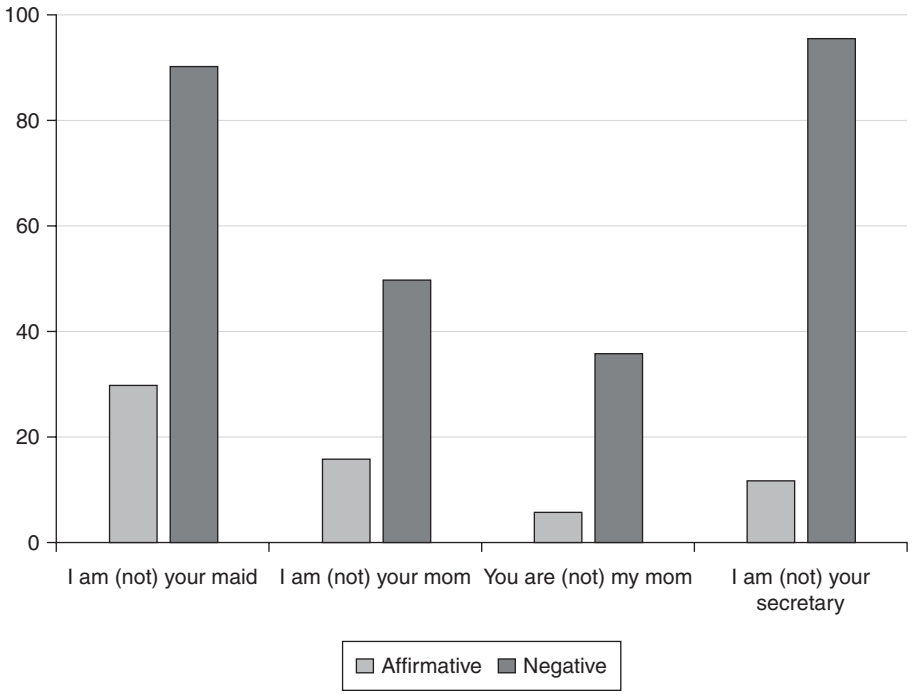


Figure 7.3 Percentage of **metaphorical** interpretations of negative vs. affirmative utterances—English data

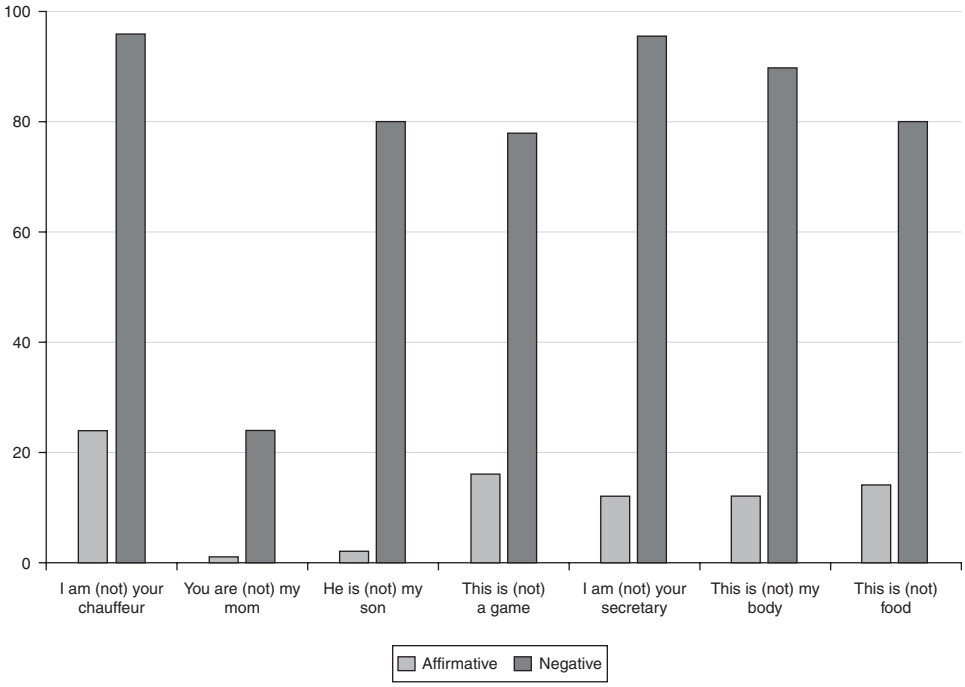


Figure 7.4 Percentage of **metaphorical** interpretations of negative vs. affirmative utterances—Russian data

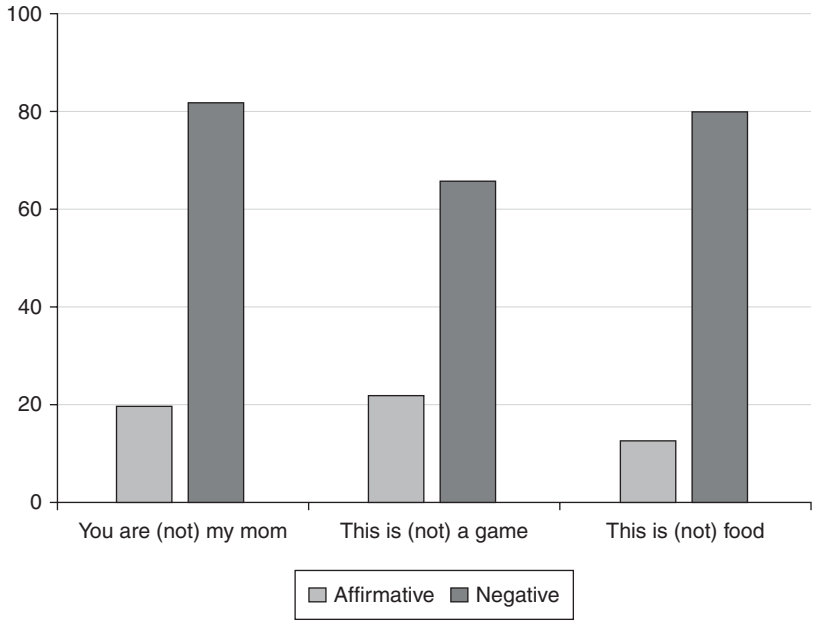


Figure 7.5 Percentage of **metaphorical** interpretations of negative vs. affirmative utterances—German data

is too hoarse. Her voice is soft echoes the nondefault **literal** interpretation of "not my mom"; in (15), *Stop driving so fast* resonates with the default **metaphorical** interpretation of "not a pilot", related to the speedy racing of the driver, comparing him to a pilot flying a plane; in (16), *the company doesn't have much regard for you or your job* resonates with nondefault **literal** interpretations of "You are not a pilot":

(13) What you are eating today is **not food**. Let's say it is food … but *not nourishing food*. (Abrosky Rotem, *The Club,* 11.8.10; in Hebrew)
(14) You are **not my mom**. *Your voice is too hoarse. Her voice is soft*. http://asianfolktales.unescoapceiu.org/folktales/read/korea_2.htm
(15) You are **not a pilot**. *Stop driving so fast*.
(16) You are **not a pilot,** therefore, *the company doesn't have much regard for you or your job*. www.indeed.com/cmp/United-Airlines/reviews?fcountry=ALL&fjobtitle=Pilot

Study 2 involved items in three languages (English, Russian, and German), expecting text production to unfold via resonating with items' default rather than nondefault interpretations. Results attest to the superiority of defaultness. They show that, in natural discourse, there is a significantly greater number of negative items being mirrored via their **default** metaphorical interpretations than affirmative counterparts being mirrored via their **nondefault** metaphorical interpretations. Such results lend support to the superiority of defaultness. They show that, as predicted by the Defaultness Hypothesis, text production mostly evolves via resonating with default rather than nondefault outputs.

Note, however that, whereas resonance with default metaphorical interpretations of negative metaphors is prevalent both in English and German, in Russian, however, it is almost nonexistent, despite the abundant display of metaphorical interpretations in the negative (see Figure 7.4 above).

3.1.3 Study 3: Testing Text Production's Unfolding via Resonance with Default Sarcastic Interpretations

Study 3 tested prediction 3, expecting the contextual environment of such negative items to echo and resonate with their default sarcastic rather than nondefault literal interpretation.

As before, we first aimed to establish the default and nondefault interpretations of negative constructions in natural use, expecting negative constructions to attest to the priority of their sarcastic over their literal interpretation.

Table 7.1 Contextual resonance with 109 negative metaphors in English

English	Only Metaphorical resonance	Only Literal resonance	Both Metaphorical and literal resonance	No resonance	p-values
I am not your maid	61.7% (29/47)	12.8% (6/47)	12.8% (6/47)	12.8% (6/47)	p<.0005
You are not my mom	55.6% (10/18)	5.6% (1/18)	27.8% (5/18)	11.1% (2/18)	p<.01
I am not your secretary	79.5% (35/44)	4.5% (2/44)	9.1% (4/44)	6.8% (3/44)	p<.0005

Table 7.2 Contextual resonance with 138 negative metaphors in German

German	Only Metaphorical resonance	Only Literal resonance	Both Metaphorical and literal resonance	No resonance	p-values
Ich bin nicht deine Mutter (I am not your mom)	58.6% (17/29)	3.5% (1/29)	13.8% (4/29)	24.1% (7/29)	p<.0005
Du bist nicht meine Mutter (You are not my mom)	63.4% (26/41)	4.9% (2/41)	17.1% (7/41)	14.6% (6/41)	p<.0005
Das ist kein Essen (This is not food)	40% (14/35)	5.7% (2/35)	14.3% (5/35)	40% (14/35)	p<.005
Das ist kein Spiel (This is not a game)	54.5% (18/33)	3% (1/33)	15.2% (5/33)	27.3% (9/33)	p<.0005

Table 7.3 Distribution of different types of resonance in the environment of 70 negative metaphors in Russian

Russian	Only Metaphorical resonance	Only Literal resonance	Both Metaphorical and literal resonance	No resonance	p-values
Я не твоя секретарша (I am not your secretary)	20% (4/20)	5% (1/20)	5% (1/20)	70% (14/20)	p=.19
Я не твоя мама (I am not your mom)	12% (6/50)	0% (0/50)	2% (1/50)	86% (43/50)	p<.05

Searching the HeTeTen corpus (a very large Hebrew corpus, comprising about 1×10^9 tokens) provided evidence for the pervasiveness of sarcasm in negative constructions, such as *He is not the most captivating actor* (meaning 'he is boring'), compared to their literal counterparts (meaning 'others are more engaging'). As shown by Giora, Givoni, & Becker (2020), of the 151 negative constructions, collected from the HeTeTen corpus, 78% (118/151) conveyed a sarcastic interpretation; the remaining 33 items were rated as literal (33/151=22%). As per binomial test, $p=1.96\times10^{-12}$, this difference is substantially significant $p<0.001$. These results established the defaultness of negative sarcasm and the nondefaultness of negative literalness.

Having established the defaultness of negative sarcasm and the nondefaultness of negative literalness, Study 3 further tested prediction 3, expecting context production to unfold via resonating with default sarcastic interpretations rather than with nondefault literal counterparts.

Results indeed showed that, of the 109 (72%) items, rated as sarcastic, 55 (~50%) were echoed by their discoursal environment. As predicted, in all these 55 (100%) cases, the environment of these utterances resonated with their default sarcastic interpretation only.

So far, then, corpus-based studies provide converging evidence for the Defaultness Hypothesis. They show that default interpretations of global negative constructions reign.

3.1.4 Study 4: Testing Text Production, Unfolding via Resonating with Default Interpretations of Multi-Layered Figurative Constructions

Study 4 further focused on multi-layered figurative constructions, involving strongly attenuating highly positive concepts (Giora et al. 2015, 2018; Giora & Becker, 2019). They each included a default sarcastic interpretation, prompted by the construction, and often a nondefault metaphorical counterpart, prompted by semantic anomaly.

The following examples illustrate the negative figurative constructions studied here and their sarcastic and nonsarcastic interpretations:

(17) S/he is not the most candid person around.
S/he is dishonest.
This utterance has a default constructional sarcastic interpretation only.

(18) S/he is not the sharpest pencil in the box.
S/he is dumb.
This utterance has a default coded constructional sarcastic meaning and a default coded metaphorical meaning, prompted by semantic anomaly.

(19) S/he is not the most sparkling drink in the pub.
S/he is boring.
This utterance has a default constructional sarcastic interpretation alongside a nondefault metaphorical counterpart.

Consider now exemplifying resonance with such default sarcastic and nondefault literal/metaphorical interpretations:

(20) She is not the most candid person around.
I know, she is really *dishonest* (resonance with **default sarcastic** interpretation).
Indeed, others are *more candid* (resonance with **nondefault literal** interpretation).

(21) He is not the sharpest pencil in the box.
Indeed, he is really *dumb* (resonance with **default** coded **sarcastic** meaning).
Right, others are *sharper/smarter* (resonance with **default** coded **metaphorical** meaning).

(22) She is not the most sparkling drink in the pub.
I know, she is *boring* (resonance with **default sarcastic** interpretation).
I know, others are *more vibrant* (resonance with **nondefault metaphorical** interpretation).

Of particular interest is the multi-layered example in (22). Given its **default sarcastic** interpretation and its **nondefault metaphorical** alternative, the question is, which interpretation will reign? Will the global, constructional sarcasm enjoy priority over the local semantically anomalous metaphorical alternative, or will the latter cue prevail? Note that both are derived automatically, either triggered by the construction (Goldberg 2003, 2006) and/or by the semantic anomaly (Beardsley 1958).

According to the Defaultness Hypothesis, however, it is the default, here the global, **constructional** sarcastic interpretations that will supersede both non-metaphorical (*She is not the most candid person around*) and metaphorical interpretations (*S/he is not the most sparkling drink in the pub*), given that they all involve strongly attenuating highly positive concepts (Giora et al. 2018).

Based on the prediction that strongly attenuating highly positive concepts generate sarcastic interpretations automatically, and often, by default (if abiding by conditions (a–c) above), we expected all three types of constructions, whether involving non-metaphorical (*She is not the most candid person around*) or semantically anomalous metaphorical layer (*S/he is not the most sparkling drink in the pub*),

(i) to be rated as sarcastic when in isolation, regardless of metaphoricity (Study 4); and when in biasing contexts,
(ii) to be rated as sarcastic, regardless of metaphoricity (Study 5); and, therefore,
(iii) to be echoed by their environment via their default sarcastic interpretation (Study 6),
(iv) rather than their nondefault metaphorical counterparts, thus affecting text production via defaultness (Study 7).

Corpus-based Study 4 then tested prediction (i), according to which, when in isolation, negative items will be rated as sarcastic, regardless of metaphoricity. Stimuli included 30 corpus-based constructions, strongly attenuating highly positive concepts: 15 metaphorical items (*She is not the most sparkling drink in the pub*) and 15 non-metaphorical counterparts (*He is not the most attractive person around*). Twenty-five participants were asked to rate the items on a 7-point sarcasm scale.

Results showed that the metaphorical constructions were rated as significantly more sarcastic (M=5.50, SD=1.10) than their non-metaphorical counterparts (M=3.70, SD=1.18), $t_1(24)=8.23$, $p<0.001$; $t_2(28)=6.18$, $p<0.001$. Overall, then, the metaphoricity of the stimuli seems to contribute to and amplify items' **sarcastic** interpretation.

3.1.5 Study 5: Testing Resonance with Items' Default Sarcastic Interpretation

Corpus-based Study 5 tested prediction 2, expecting items' natural environment to resonate with items' default sarcastic interpretation, irrespective of degree of metaphoricity.

Stimuli were 76 items, 38 metaphorical and 38 non-metaphorical constructions, extracted from the HeTenTen corpus. Results showed that most of the metaphorical constructions (35/38=92%) were rated as sarcastic by at least two judges (binomial test, $p<0.001$), as were most of the non-metaphorical constructions (26/38=68%), which were also rated as sarcastic by at least two judges (binomial test, $p<0.05$).

As before, although most of the items in each list were rated as sarcastic, there were significantly more metaphorical items rated as sarcastic than non-metaphorical counterparts, $X^2(1)=6.7$, $p<0.01$ ($\phi=0.298$).

3.1.6 Study 6: Testing Prediction 3 re Resonance with Default Sarcasm

Corpus-based Study 6 tested the prediction that items' contextual environment will resonate with and echo their default sarcastic interpretation, regardless of degree of metaphoricity. Results showed that, of the 35 metaphorical items, rated as sarcastic, 31 were echoed by their environment; of which, 26 were echoed by their environment via their default sarcastic interpretation (26/31=84%, binomial test, $p<0.001$). Of the 26 non-metaphorical constructions, 21 were rated as sarcastic; of which, 17 were echoed by their environment via their default sarcastic interpretation (17/21=81%, binomial test, $p<0.05$).

As before, the metaphorical items affected sarcasm more strongly than their non-metaphorical counterparts. Importantly, however, contextual resonance did not distinguish between the groups; where the environment was echoic, it resonated with both, the metaphorical and non-metaphorical

constructions, via their default sarcastic interpretation. Such results attest to the superiority of the global, constructional cue over its local, semantically anomalous competitor.

Will examining contextual resonance with the metaphorical aspects of the metaphorical constructions lend further support to the superiority of the global sarcastic interpretation found in this study?

3.1.7 Study 7: Testing Prediction 3 Regarding Low Resonance with Metaphoricity

In Study 7, we aimed to find out whether resonance with innovative metaphorically-layered interpretations of strongly attenuating highly positive concepts (e.g., *S/he is not the most sparkling drink in the pub*) will be echoed by their environment via their default sarcastic rather than their nondefault metaphorical interpretation.

Results showed that, as predicted, only 4 out of the 38 metaphorical constructions (4/38=11%) were echoed by their environment via their metaphorical interpretation. Such (close to null) results support the superiority of these items' default constructional sarcastic interpretation over their nondefault semantically anomalous metaphorical counterparts.

4. Conclusions

Based on results of nine experiments and seven corpus-based studies, testing default and nondefault interpretations of negative items, we could safely conclude that our findings attest to the creativity of negation; the negative constructions tested here affected figurativeness by default, both metaphorically and sarcastically. They thus attest to the superiority of default, global cues, such as constructional interpretations (as per Goldberg 2003, 2006), over nondefault local cues, such as semantic anomaly (as per Beardsley 1958). Our findings then suggest that global (here negative) constructional interpretations are analogous to the precedence of the forest before the trees principle where perceiving the whole precedes its parts (Navon 1977, 1981).

Notes

1 Unless explicitly indicated differently, all the stimuli are originally in Hebrew.
2 For strong attenuation of highly negative concepts by means of similes, see Veale (2013).
3 All these factors have been controlled here by pretests.
4 See Giora & Becker (2019).
5 Given that we are focusing here on interpretations rather than meanings, such items will not be discussed here, but see Givoni & Giora (2018).
6 This is the affirmative version in Hebrew.
7 Note that in Hebrew, affirmative utterances use "yes" explicitly.

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Related Topics

construction grammar and frame semantics; standard and extended conceptual metaphor theory

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PART II

Central Topics in Cognitive Linguistics



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8
EMBODIMENT

Xu Wen and Canzhong Jiang

1. Introduction

Embodiment, in its most general sense, is pertinent to the problem of body-mind relation. As one of the most fundamental philosophical problems, it has been a subject of concern from ancient Greek philosophers Plato and Aristotle to modern philosopher Descartes, and to more recent philosophers including Dewey, Piaget, Merleau-Ponty, Vygotsky, and Johnson, to mention just a few. Two approaches in stark contrast have been put forward to solve this problem, that is, the disembodied approach and the embodied approach.

The disembodied approach, unequivocally articulated by Descartes with ideas sprouting from Plato and Aristotle, holds a dualistic position that the mind is qualitatively differentiated and separated from the physical body. This position has exerted profound influence on not only philosophy but also other disciplines such as cognitive science, psychology, sociology, and, of course, linguistics. For example, it provides the underlying basis for objectivism, formalism, and computationalism in philosophy, cognitive science, and linguistics which maintain that concepts are reducible to sufficient and necessary conditions, and meaning existing out there in the physical world can be computed through abstract symbol manipulation inside the skull with the body merely serving as an input and output device. However, Hanna and Maiese (2009: 2) believed that "mainstream contemporary philosophy of mind and cognitive neuroscience (in a broad sense that includes cognitive psychology, medical neurology, neurophysiology, and neurobiology) have been significantly distorted and misled by" the disembodied position. If they are correct, the same situation could have confronted other neighboring disciplines, linguistics included.

During the 1980s, a reaction against the disembodied approach emerged, or rather re-emerged from previous ideas advocated by von Uexküll, Merleau-Ponty, Piaget, Vygotsky, Bartlett, and Dewey, etc. (Lindblom 2015: 82), giving rise to the embodied approach. The embodied approach attempts to put the mind and the body together again and argues that the body matters to the mind. The radical shift from the disembodied approach to the embodied approach has brought drastic change in disciplines bothering themselves with the body-mind relation problem. It challenges the Western philosophical tradition (Lakoff & Johnson 1999), promotes the development of second-generation cognitive science from first-generation cognitive science, revolutionizes cognitive neuroscience and even artificial intelligence, and prompts a leap from Chomskyan generative cognitive linguistics to embodied Cognitive Linguistics fathered by Lakoff, Langacker, and Talmy.

The embodied approach is gaining ground with converging evidence from diversified areas including behavioral studies, psychological, neural, and neurophysiological experiments, language studies, and even engineering in robotics. However, such extensive attention from a wide range of disciplines also renders it difficult to offer a unified and systematic elaboration on embodiment. In this case, this chapter will confine itself to embodiment in Cognitive Linguistics. More specifically, it will first describe the development of the embodiment thesis in Cognitive Linguistics and then explicate how this thesis has been embodied in major areas of cognitive linguistic research including conceptualization, language processing, language development, and language change.

2. Embodiment in Cognitive Linguistics

Embodiment is broadly used to mean "something about how the mind relates to the body" but a widely acknowledged definition has not been achieved in that there are many definitions invoked by scholars of different backgrounds (Bergen 2019: 13). According to Rohrer (2007: 28–31), embodiment can be interpreted with at least 12 different important senses, while Bergen (2019: 13) generalized seven realizations that it can signify. Nevertheless, Cognitive Linguistics is particularly concerned with embodiment in the sense that linguistic concepts and linguistic conceptualization are grounded in bodily apparatus and bodily and sociocultural experience. Or, to put it another way, language as part of cognition is motivated by embodied experience.

Embodiment is one of the most fundamental concepts in Cognitive Linguistics in that it underlies the guiding principles and theoretical assumptions for both cognitive semantics and cognitive approaches to grammar. The idea of embodiment emerged after the advent of the cognitive linguistic enterprise in the late 1970s and early 1980s. Through their investigation of metaphors, Lakoff and Johnson (1980) proposed that metaphors permeating everyday language are also pervasive in thought and action to the extent that the conceptual system underlying our thought and action is fundamentally metaphorical. They discovered that ordinary languages characterizing our daily experiences are systematically governed by a relatively small set of metaphors and underlying these metaphors are conceptual mappings with a principled directionality, that is, mappings from more concrete concepts as source domains onto less concrete and inherently vaguer concepts in the target domains. These more concrete concepts are essentially grounded in bodily experience, more specifically, experience of the body, of the physical environment, and of the culture. In this sense, conceptual metaphors and the conceptual system in general are embodied.

After the initiation of the embodiment thesis based on conceptual metaphors, researchers in Cognitive Linguistics became increasingly aware of the vital role played by the body and bodily experience in shaping linguistic concepts and conceptualization, and consequently this thesis has been elaborately enriched in its content and rapidly expanded in its scope. Lakoff (1987) focused on what categories reveal about the mind and argued that categories structured by prototype effects correspond to elements in cognitive models including propositional and image-schematic models that characterize structure and metaphoric and metonymic models that characterize mappings making use of structural models. These cognitive models are embodied in that they are subject to perception, Gestalt perception in particular, motor activities, and interactions with the physical and sociocultural world. In a word, what categories reveal about mind is that it is embodied. Johnson (1987) was primarily concerned with image schema through which he hoped to put the body back into the mind. According to him, image schemas are recurring, dynamic topological patterns that "emerge primarily as meaningful structures for us chiefly at the level of our bodily movements through space, our manipulation of objects, and our perceptual interactions" (Johnson 1987: 29), and they can be metaphorically mapped onto nonphysical, nontactile, and nonvisual domains, thus providing embodied basis for them. Research by Lakoff and Johnson has elaborated and expanded the embodiment thesis mainly from a cognitive semantics perspective, while Langacker (1987, 1991) offered a complementary perspective by establishing a cognitive approach to grammar—Cognitive

Grammar which is motivated by spatial relations. Although Langacker himself scarcely referred to embodiment, embodied or bodily experience directly, his theory of Cognitive Grammar is based on embodiment in nature because he attempts to ground his basic theoretical constructs in perceptual processes, especially in the processes by which physical situations are construed, scenes are scanned, objects are picked out and compared, and their shapes are identified, and so forth. He also talked about thought as "the occurrence of a complex neurological, ultimately electrochemical event" and considers the formations of a concept as establishment of "a particular pattern of neurological activity" (Langacker 1987: 100), which roughly embodies the neural level of embodiment in Lakoff and Johnson (1999).

Lakoff and Johnson (1999) established a more full-fledged embodiment thesis by synthesizing previous findings in metaphors, prototypes, categorization, basic-level objects, image schemas, and so forth, and refining them with new proposals. They made it clear from the very beginning that the mind is embodied in the sense that "the very properties of concepts are created as a result of the way the brain and body are structured and the way they function in interpersonal relations and in the physical world" (Lakoff & Johnson 1999: 37). They further expounded that in an embodied mind, the same neural system engaged in perception (or in bodily movement) plays a central role in conception. To put it another way, the very mechanisms responsible for perception, movements, and object manipulation could be responsible for conceptualization and reasoning (Lakoff & Johnson 1999: 38). They distinguished three levels of embodiment which are not independent of each other, i.e., the neural level which concerns structures that are characteristic of concepts and cognitive operations at the neural level, the phenomenological level that consists of everything we are conscious of, or that is accessible to our consciousness, including our own mental stages and bodies, the environment, and our physical and sociocultural interactions, and the cognitive unconscious that involves all the mental operations structuring and making possible all conscious experience. Through their systemization of the embodiment thesis, Lakoff and Johnson hoped to establish an embodied philosophy which is apparently the philosophical foundation of the whole cognitive linguistic enterprise.

Embodiment has co-evolved with the development of the cognitive linguistic enterprise. Cognitive linguistic research continuously enriches and expands the embodiment thesis by providing more and more converging linguistic evidence. In turn, embodiment benefits Cognitive Linguistics a lot by offering the ultimate motivation for issues of central concern to cognitive linguists. In the following sections, we will confine ourselves to four major areas, i.e., linguistic conceptualization, language processing, language development, and language change, and discuss their embodied nature.

3. Embodied Linguistic Conceptualization

Cognitive Linguistics is committed to the ultimate goal of casting bright light upon the Rosetta Stone of the human mind through a systematic investigation of language by taking a functionalist path, as opposing to the structuralist path, with its direction being set towards linguistic meaning. In other words, meaning is the top priority for Cognitive Linguistics. It is assumed to be equal to conceptualization, and conceptualization as a dynamic cognitive operation is fundamentally embodied. Early cognitive linguistic studies including Langacker (1987) and Talmy (1988) have demonstrated how linguistic conceptualization is motivated by spatial thinking. But the embodied nature of linguistic conceptualization and thus meaning is most evident in studies on metaphorical conceptualization underlying linguistic metaphors, which even leads to Rohrer's (2007) conclusion that the embodiment thesis is nearly inextricable from the conceptual metaphor.

The inception of conceptual metaphor theory since Lakoff and Johnson (1980) ushered in a new era for metaphorical research. From then on, metaphor was conceived as not only a linguistic phenomenon pervasive in everyday language but also a way of thinking, and was reinterpreted

as conceptualizing one conceptual domain in terms of another. Metaphorical conceptualization is observed to be unidirectional with less concrete concepts as the target domains being conceptualized in terms of more concrete concepts as the source domains, but not vice versa. Those more concrete concepts draw extensively on embodied experience. Consequently, metaphorical conceptualization is embodied. Most direct evidence comes from the straightforward invoking of the human body *per se* in metaphorical conceptualizations, as is exemplified in Sharifian, Dirven, Yu, and Niemeier's (2008) collection in which internal body organs such as heart, liver, and guts are taken as the source domains, and in Maalej and Yu's (2011) collection in which body parts such as face, mouth, head, eye, belly, and feet are resorted to in metaphorical conceptualization of more abstract and less embodied concepts. In addition to the human body, metaphorical conceptualization also recruits source domains grounded in physical objects we interact with, our five sensory perceptions including visual, auditory, olfactory, gustatory and tactile experiences, our motor experience, and sociocultural experiences. For example, Lin and Depner (2016) found that in Hakka language target domains LIFE, PERSONALITY, and HUMAN RELATION are conceptualized in terms of FOOD. IJzerman and Semin (2009) and Wilkowski et al. (2009), focusing respectively on interpersonal proximity and anger, proposed that these two abstract concepts are conceptualized in terms of tactile experience of physical warmth, while Lee and Schwarz (2012), interested in the concept of suspicion, discovered that conceptualization of this concept relies on olfactory experiences (i.e., suspicion is metaphorically expressed as something smelling fishy). Lakoff (1990, 1993, 1994) pointed out that in English time passing can be conceptualized with regard to motion. Tsai and Depner (2016), attracted by two Chinese culture-specific legendary animals—dragon and phoenix—argued that these two cultural concepts are metaphorically mapped onto the process of growth and development in humans in political and economic contexts.

When metaphorical conceptualization is built upon the body and bodily experiences, it is directly embodied, as illustrated above. However, it can also be indirectly embodied by recourse to directly embodied conceptualizations which include image schemas and primary metaphors. Image schemas are mental representations schematized from recurring dynamic patterns of our perceptual and motor experiences (Johnson 1987). Evans (2019: 236) offered a non-exhaustive list of image schemas with eight major categories including **SPACE schemas** such as UP-DOWN, FRONT-BACK, LEFT- RIGHT, NEAR-FAR, CENTRE-PERIPHERY, **CONTAINMENT schemas** such as CONTAINER, IN-OUT, SURFACE, FULL-EMPTY, **LOCOMOTION schemas** such as MOMENTUM, SOURCE-PATH-GOAL, **BALANCE schemas** such as AXIS, BALANCE, TWIN-PAN BALANCE, **FORCE schemas** such as COMPULSION, BLOCKAGE, COUNTERFORCE, **UNITY/MULTIPLICITY schemas** such as MERGING, COLLECTION, SPLITTING, COUNT-MASS, **IDENTITY schemas** such as MATCHING, SUPERIMPOSITION, and **EXISTENCE schemas** such as REMOVAL, BOUNDED SPACE, CYCLE. Though schematic, these image schemas preserve the structure and perceptual and motor aspects of the specific experiences (Hampe & Grady 2005) and they serve to further ground other more complex conceptualizations. For instance, one of the most frequented metaphors, LOVE IS A JOURNEY, is structured on the SOURCE-PATH-GOAL schema.

Primary metaphors arise from studies by Grady (1997) and Grady, Oakley, and Coulson (1999). According to their observation, some conceptual metaphors are more primary than others and they are thus called primary metaphors. Primary metaphors are characterized by metaphorical mappings for which there are independent and direct experiential bases that can be expressed within language (Gibbs 2017), that is, they are created through everyday embodied experiences. The existence of primary metaphor has received converging evidence from studies on social judgement. For example, the primary metaphor AFFECTION IS WARMTH is validated by participants' judging of another person's interpersonal traits as being warmer if they held warm, as opposed to cold, cups of coffee (Williams & Bargh 2008). The primary metaphor GOOD IS CLEAN/BAD

IS DIRTY is also echoed by participants' choice of an antiseptic wipe, instead of a set of pencils, as a free gift after the experiment (Zhong and Liljenquist 2006). Casasanto and Dijkstra (2010) claimed that the correlation between participants' recounting of positive or negative memories and their moving marbles up or down is consistent with the primary metaphor GOOD IS UP/BAD IS DOWN. Another experiment on participants' judgment of whether a fictitious person was suitable for a job revealed a congruent relation to the primary metaphor IMPORTANCE IS WEIGHT since applicants were judged to be better if participants held a heavier, rather than a lighter, clipboard (Ackerman, Nocera, & Bargh 2010). In addition to those mentioned above, primary metaphors also include: INTIMACY IS CLOSENESS, DIFFICULTIES ARE BURDENS, IMPORTANT IS BIG, MORE IS UP, SIMILARITY IS CLOSENESS, STATES ARE LOCATIONS, CHANGE IS MOTION, PURPOSES ARE DESTINATIONS, CAUSES ARE PHYSICAL FORCES, KNOWING IS SEEING, UNDERSTANDING IS GRASPING, and so forth. Primary metaphors can be combined to create complex metaphors, thus grounding more complex conceptualizations. A case in point is that the conceptual metaphor THEORIES ARE BUILDINGS is grounded in three primary metaphors, PERSISTING IS REMAINING ERECT, STRUCTURE IS PHYSICAL STRUCTURE, and INTERRELATED IS INTERWOVEN.

The above discussion of metaphorical conceptualization is restricted roughly to cognitive operations beneath all conscious experiences and it only deals with Lakoff and Johnson's (1999) cognitive unconscious level of embodiment in linguistic conceptualization. We will further explain how linguistic conceptualization is motivated by the phenomenological level of embodiment, with special attention being paid to our consciousness of cultural contexts and social interactions.

Cultural contexts exert not inconsiderable influence on conceptualization. Although humans are equipped with a similar biological morphology and interact with a similar physical environment in a similar way, they experience quite different cultures, and these varied cultural experiences lead to variations of cultural conceptualization. Kövecses (2000, 2005, 2010, 2015), Yu (1998, 2008, 2009, 2014), and Sharifian (2011, 2017), among others, have contributed a lot to the cultural embodiment of conceptualizations. Kövecses and Yu have directed most of their attention to metaphorical conceptualization. Their research demonstrates that culture-specific experiences give rise to culture-specific or at least culturally salient metaphorical conceptualizations, and sometimes even cultural variations within the same culture between different groups at different time periods. By comparing four equivalent emotion concepts, i.e., *anger* in English, *düh* in Hungarian, *nu* in Chinese, and *ikari* in Japanese, based on previous research, Kövecses (2010) concluded that in the two representing Euro-American cultures, *anger* or *düh* is conceptualized by the culture-specific *four humors* (the four fluids, phlegm, black bile, yellow bile, and blood that regulate the vital processes of the human body), while *nu* in Chinese culture and *ikari* in Japanese culture are respectively conceptualized through culture-specific concepts of *qi* (the energy that flows through the body according to traditional Chinese medicine) and *hara* 'belly'. According to Yu (1998), it is culturally salient practice in Chinese that metaphorical conceptualizations of ANGER and HAPPINESS are motivated by a variety of internal organs, like the heart, liver, spleen, and gall, due to the influence of traditional Chinese medicine, which offers evidence that Chinese is a "heart-centering" language, as distinguished in Sharifian et al. (2008), in contrast to the "abdomen-centering" languages including Basque, Indonesian, Kuuk Thaayorre, and Malay, and the "heart/head-centering" languages including Dutch, English, Northeastern Neo-Aramaic, Persian, and Tunisian Arabic. In addition to metaphorical conceptualizations, Sharifian was also concerned with cultural schemas and cultural categories. He indicated that conceptualization is culturally embodied. In terms of cultural schemas, they are emergent properties of cognition at the level of cultural group instead of the individual, emerging from interactions among individuals belonging to the cultural group (Sharifian 2011: 6). These culturally embodied schemas may vary and arouse culture-specific conceptualizations. For example, the image schema of PATH is a straight image

in Western cultures while it is a circular or spiral pattern in Aboriginal Australian culture, which results in quite different cultural conceptualizations of ideologies between the two cultural groups (Sharifian 2011). As for cultural categories, Sharifian (2017) argued that categorization is intrinsically cultural, consequently bringing about cultural categories. There are variations in cultural categories resulting from different cultural experiences, as is evidenced by the kinship category in English contrasting to its counterpart in Chinese which contains many more members, which also embodies cultural embodiment of conceptualizations.

Social interaction at the phenomenological level of embodiment has received much less attention than it deserves in Cognitive Linguistics compared with culture context at the same level. However, its role in language and conceptualization can never be ignored since language acts as an essential medium for social interaction. What follows is devoted to an examination of how social interaction motivates linguistic conceptualization, specifically how the conceptualizer's consciousness of other interlocutors in social communication motivates his/her meaning construction. Fischer (2006) carried out a very interesting corpus-based investigation on particles such as *aber*, *doch*, *eigentlich*, *so*, *also*, *ne*, *ja*, *genau*, *mhm*, *hm* in German by comparing how they are used in communicative contexts with different interlocutors, i.e., human-human communication and human-computer interaction. It was found that compared with human-human communication, in human-computer interaction there is a significant decrease in the use of particles that function to highlight politeness and interactivity including modal particles (*aber*, *doch*, *eigentlich*), discourse particles (*so*, *also*, *ne*), and feedback signals (*ja*, *genau*, *mhm*), but a significant increase in the use of the feedback signal particle *hm* which indicates divergence. In addition, *ne* in human-human communication assumes the function of seeking positive feedback from the hearer to make sure that he/she understands the speaker, but this function is probably missing in human-computer interaction. Jiang and Kuang (2019) ascribed such changes in the use of these particles to social categorization whereby the speaker categorizes a human interlocutor as in ingroup member while the computer interlocutor is categorized as an outgroup member, and shows ingroup-outgroup bias by taking a more active and cooperative role in human-human communication while less so in human-computer interaction. Fischer's investigation indicates that meaning construction in social communication is constrained by a speaker's consciousness of who the hearer is. In this sense, linguistic conceptualization is embodied in social interaction.

4. Embodied Language Processing

How can we understand one another by simply uttering some seemingly arbitrary sounds called language? How are these sounds processed? There are no easy answers to these questions. Two broad approaches are identified, i.e., the disembodied approach and the embodied approach. The disembodied approach endorsed by linguists aligning themselves with the first-generation cognitive scientists and analytic philosophers maintains that these sounds symbolizing concepts characterized by sufficient and necessary conditions act as input and are processed in and through abstract symbol manipulation inside the brain with the body being merely ancillary to this process. However, the vast majority of recent psychological and cognitive neurological experiments on real-time language processing have verified the involvement of the body. This leads to the embodied approach which advocates that language processing occurs not only inside the brain but also outside it, and the sounds act as prompts for the activation of sensory, motor, and affective systems (Bergen 2012). This approach is adopted by cognitive linguists who have aligned themselves with the second-generation cognitive scientists and embodied philosophers. It is also the primary concern of this section. We will illustrate the embodiment of language processing from two levels, i.e., bodily behavioral immersion and automatic activation of brain regions.

4.1 Bodily Behavioral Immersion

Zwaan (2004: 36) pointed out that "language is a set of cues to the comprehender to construct an experiential (perception plus action) simulation of the described situation". Thus, he describes language comprehenders as immersed experiencers. In real-time language processing, specialized bodily behaviors are activated simultaneously, as if corresponding sensorimotor activities are engaged. Such bodily behavioral immersion is observed in a set of laboratory experiments which generally fall into three categories including compatibility experiments, facilitation experiments, and interference experiments, with the former two categories centering on direct evidence and the latter indirect.

Compatibility experiments examine whether participants' comprehension of language is compatible with their bodily behaviors, measured by their response time. Glenberg and Kaschak (2002) presented an action-related study and they asked participants to make judgments on whether sentences describing motion towards or away from the body are sensible or not by pressing a button placed either close to or farther away from the participants' own bodies. They found that participants made faster sensibility judgment for sentences like *Close the drawer*, which indicates an action of moving away from the body, when they could stretch out to press the button away from their bodies than when they had to press it by moving their hands towards their bodies, and a reversed result was observed while processing sentences implying movement towards the body such as *Open the drawer*. Another action-related study was done by Buccino et al. (2005), whereby participants were required to make judgments on the content of hand-action-related sentences and foot-action-related sentences either with the hand or with the foot. Buccino et al.'s study showed that reaction times are slower in processing hand-action-related sentences when the hand is used to respond while reaction times are slower in processing foot-action-related sentences when the foot is used to respond. Action-related studies illustrate that language processing involves the simulation of the very motor actions encoded in the language.

Similar studies have also been performed on processing of language related to sensory perception and vision in particular. For example, Stanfield and Zwaan (2001) had the participants make yes-no decisions on pictures of the object in each of the two orientations (vertical-horizontal) after presenting them with sentences that implicitly suggest a particular orientation for an object (e.g., *The carpenter hammered the nail into the wall* implying a horizontal orientation). They responded faster to pictures with the orientation of the object matching that implied by the sentence than those not. That is, when they were presented with the sentence *The carpenter hammered the nail into the wall*, they were faster to say 'yes' to the picture with a nail in a horizontal orientation than one in a vertical position. Based on this finding, Zwaan, Stanfield, and Yaxley (2002) conducted another experiment with the stimulus changed into the shape of the object and a similar result was testified that faster responses were made to pictures with the object matching what was implied in the given sentence than those not. These two vision-related studies demonstrated that language processing recruits perceptual experiences.

Facilitation experiments investigate whether language processing can be facilitated by the involvement of sensorimotor activities. In a study on the relationship between body movements and processing of metaphorical phrases, Wilson and Gibbs (2007) guided their participants with specific cues (icons flashing on the screen) to prompt different body movements and then asked them whether they understood the metaphorical phrases presented to them or not by pushing a button as soon as possible. Participants were found to have understood a metaphorical phrase, for example *push the argument*, faster when they had just made a correlating body movement, for example a push movement. The same result is found even if participants are only asked to imagine themselves performing a body movement cued by the icon. Findings from Wilson and Gibbs supported the claim that an appropriate motor action, even an imagined one, can facilitate the processing of metaphorical language. Casasanto (2008) offered a test on the relationship between spatial proximity

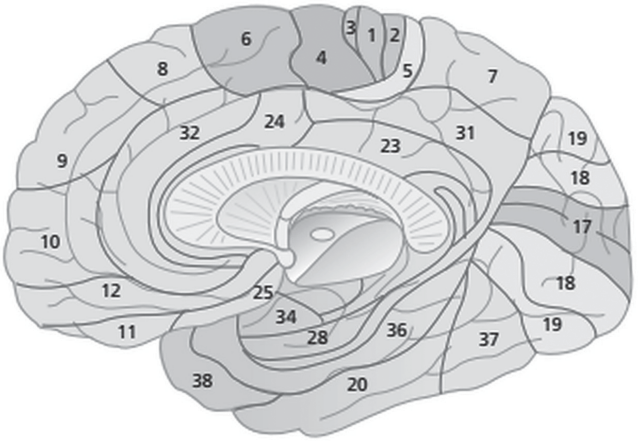
(or generally sensory experience compared with the above motor action) and language processing by examining participants' ratings of similarity for pairs of words under the condition that these word pairs appeared on the computer screen with different distance. The result was that word pairs presented closer together were rated more similar than those that were distant. This research proved that sensory priming facilitates language processing.

Interference experiments are performed to discover whether "paralyzing" sensorimotor systems will interfere with language processing. Glenberg, Sato, and Cattaneo (2008) did such a study by fatiguing participants' motor systems. They had the participants move hundreds of beans in one direction or the other so as to fatigue their motor systems, controlling hand motion in the direction either away or towards their bodies. Then they asked them to make judgments on sentences describing motion in the same direction or a different direction. They found that when the motor system was fatigued with hand motion in a particular direction, a longer time was needed to make judgments on sentences encoding motion in the same direction. In this case, fatiguing the motor system will impede language processing, which provides a negative stimulus for the activation of sensorimotor systems.

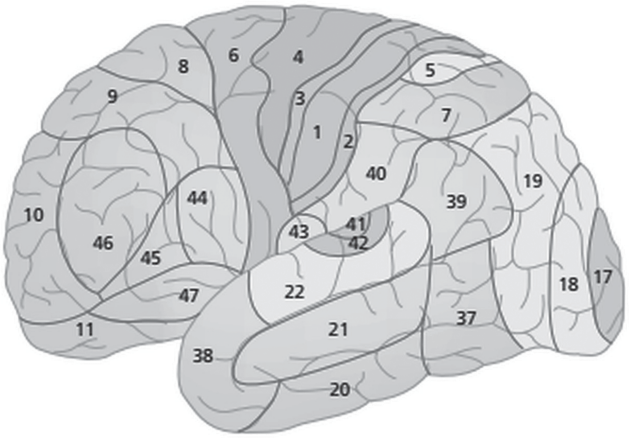
4.2 Automatic Activation of Brain Regions

Neuroscientists have identified different regions in the human brain that are responsible for different human functioning, such as visual, auditory, olfactory, gustatory and tactile perception, motor activities, affections, and language. Figure 8.1 offers a glimpse of cortical regions assuming sensorimotor functions. During the execution of sensory perception or body action, relevant cortical regions will be active. However, increasing numbers of psychological and neurological experiments utilizing technologies including event-related potentials (ERPs), functional magnetic resonance imaging (fMRI), and transcranial magnetic stimulation (TMS), have observed that brain regions processing sensorimotor and affective information are also simultaneously, automatically activated in language processing, which manifests that the same neural system engaged in sensorimotor and affective processing is also central to language processing. That is, language processing is neurologically embodied. This argumentation will be fleshed out by experiments on activation of specific brain regions in specific language processing.

Tettamanti et al. (2005), Zhang et al. (2018), and Desai et al. (2011) were attracted by processing of action-related language and its relation to brain regions governing motor actions. Tettamanti et al. (2005) used fMRI technology to monitor participants' neuronal activity by measuring changes in hemodynamics while they were listening to sentences describing actions performed with the mouth, the hand, or the leg. They found that the premotor cortex where electrical signals are sent to trigger skeletal muscles and control body-part-specific actions was also activated. The same technology was also employed by Zhang et al. (2018) but they did a more inclusive survey on the processing of general action verbs, instead of actions specifically related to the mouth, the hand, or the leg. In their experiment, participants were asked to describe pictorial stimuli as either object nouns or action verbs performed on/with the object, and they compared brain regions activated during the processing of these two linguistic categories. The experiment result showed that the cortical-subcortical motor system in the left hemisphere is active during the processing of action verbs compared with the processing of object nouns. Complementary to Tettamanti et al. (2005) and Zhang et al. (2018) which centered on the processing of language related to physical actions, Desai et al. (2011) examined the processing of action-related metaphors as in *The public grasped the idea*. They made a comparison between brain regions activated in the processing of sentences encoding physical action and those activated in the processing of sentences encoding metaphoric action through the same technology. They found that nearly identical motor regions were witnessed to be active in the processing of both types of language. Therefore, they came to the conclusion



Lateral surface



Principal motor areas
4 Primary motor cortex (M1)
6 Supplementary motor area, on medial surface (SMA)
6 Premotor area, on lateral surface (PMA)
23, 24 Cingulate motor areas

Principal sensory areas
3, 2 and 1 Primary somatic sensory cortex (SI)
40 Secondary somatic sensory cortex (SII)
17 Primary visual cortex
18, 19 Visual association cortex
41, 42 Primary auditory cortex – hidden, on superior temporal gyrus
22 Auditory association cortex

Figure 8.1 Cortical regions for sensory and motor control
Source: Clarke & Lemon 2016: 21.

that even the processing of (abstract) metaphoric actions retains a link to motor systems involved in performing physical actions.

Tettamanti et al. (2005), Zhang et al. (2018), and Desai et al. (2011) have proven the engagement of motor regions in the brain during the processing of action-related language, and the functional role of these regions is further clarified by Pulvermüller et al. (2005), Shapiro et al. (2001), and Damasio & Tranel (1993). Pulvermüller et al. (2005) paid special attention to the processing of words referring to leg and arm (and hand) actions. Their experiment was performed on healthy right-handed participants, whose response times to hand- and leg-related words were compared after receiving stimulation in the hand- and leg-motor areas in their left language-dominant hemisphere while they were processing these words. It was found that hand-motor areas TMS results in faster processing of hand-related words than leg-related ones whereas leg-motor areas TMS leads to faster processing of leg-related words than hand-related ones. In this sense, the engagement of motor regions in the brain will promote action-related language processing. Shapiro et al. (2001) applied the same technology to motor areas but they executed a completely opposite procedure whereby the excitability of motor areas in the left prefrontal cortex was suppressed instead of activated during participants' processing of nouns and verbs. They found that the suppression of the excitability of motor areas impaired the processing of verbs but not nouns. Damasio and Tranel (1993) experimented on patients who suffered from lesions to their left cortex and found that those with lesions to their left frontal cortex, which is dedicated to motor control, have difficulties in processing verbs. This result is resonant with the TMS experiment by Shapiro et al. (2001) and demonstrates the vital role of engagement of motor areas in action-related language processing.

In fact, the automatic activation of motor regions in the brain during action-related language processing is by no means an isolated phenomenon. Brain regions controlling visual, auditory, olfactory, gustatory, tactile perceptions, and affection as well, are also at work during the processing of language related to audition, olfaction, taste, texture, vision, and emotion. For example, Schmidt-Snoek et al. (2015) compared participants' processing of sentences about literal sounds (e.g., *The sound was her bitter sob*) and auditory metaphors (e.g., *Her marriage was a long sob*) with the aid of ERP. Their analysis revealed that the same sensory-motor regions of the brain were activated in the processing of auditory language, whether literal or metaphorical. Citron and Goldberg (2014) observed an increased activation of primary and secondary gustatory areas (lateral orbitofrontal cortex, frontal operculum, and anterior insula) through fMRI technology during the processing of taste metaphors (e.g., *She looked at him sweetly*) contrasting to corresponding non-gustatory paraphrases (e.g., *She looked at him kindly*). Lacey, Stilla, and Sathian (2012) using fMRI technology witnessed an activation of texture-selective somatosensory cortex during the processing of textural metaphors (e.g., *Sam had a rough day*) compared with corresponding literal sentences (e.g., *Sam had a bad day*). More inclusive studies on auditory, gustatory, tactile, and visual language processing are presented in Goldberg, Perfetti & Schneider (2006a, 2006b). By recourse to fMRI technology, they verified that processing of visual-related language increased activation of ventral temporal regions typically ascribed to visual object recognition; processing of tactile-related language increased activation of somatosensory, motor, and premotor cortical regions; processing of taste-related language increased activation of medial orbitofrontal regions associated with taste and smell; while processing of auditory-related language increased activation of the primary auditory cortex. Isenberg et al. (1999) focusing on the processing of linguistic threat testified that the processing of danger elicited by language involved an increased activity in the amygdala, a primary function of which is processing emotional reactions. This region is also reported to be activated in the processing of conventional metaphors which are claimed to be more emotionally evocative (Citron & Goldberg 2014).

In summary, language processing is essentially embodied. It occurs inside the brain in the sense that multiple brain regions controlling sensorimotor systems and affection are automatically

activated in addition to those localized for language. Meanwhile, it proceeds outside the brain in the sense that it automatically invokes bodily behaviors as if language users are immersed in corresponding sensorimotor activities.

5. Embodied Language Development

How does language develop in the early stage of human life? This question has fascinated scholars from different fields and various proposals have been made, for example, the stimulus-response-reinforcement assumption that language is learned through positive reinforcement of successive approximations after learners' behavior of imitation aroused by the stimuli–language input, the hypothesis testing assumption that learners learn a language in an inductive way whereby they establish hypotheses (generalizing linguistic rules) for encountered language input and then test these hypotheses later, and the parameter setting assumption that language is learned deductively in the sense that learners use specific language inputs as triggers to set correct while ruling out any other parameters in the innate Universal Grammar which contains the set of universal linguistic properties and the set of parameterized properties for a specific target language. Cognitive linguists adopt a usage-based assumption, arguing that language learning proceeds via statistical and associative learning mechanisms through interactions between individual and environment (Hockema & Smith 2009). Therefore, language development is embodied.

The embodied language development thesis is most directly elucidated by research on how the body itself matters to child language development. For instance, Maouene, Hidaka, and Smith (2008) probed into the relation between body parts and early-learned verbs. They asked 50 adults to provide a single body part for 101 common English early-learned verbs which are thought to constitute the initiation of the English verbal system and the result revealed that there is a highly systematic and structured pattern of association of these verbs with the mouth and the leg, the hand and the arm, and not any one specific body part, which is basically consistent with the processes of the acquisition of these verbs, that is, acquisition of verbs associated with leg and mouth regions at 21 months, of verbs associated with the hand and arm regions between 22 and 27 months, and of verbs not so strongly associated with any one body part later. They argued that the result implied the embodiment of early verb learning. This argumentation is validated by Maouene et al. (2016). Maouene et al. (2016) did a survey on 89 verb types in the Child Language Data Exchange System (CHILDES) corpora by coding them with their associations with the head, arm, and leg body regions for the investigation of how they are associated with six argument structures. Their survey exhibited that there is a highly frequent and early appearance of correspondences between argument structures and verbs associated with specific body regions, which helps infants learn abstract argument structures.

It is not only the body that matters to language development, but bodily sensorimotor experiences also play a key role in this process. Smith (2003) examined the role of spatial perceptual experience. After repeatedly cueing infants with two toys in a row (A always on the left and B on the right), she pointed to and labeled a spot on either the left or the right with a novel word (e.g., *modi*) and asked infants to get the *modi* when these two toys were placed into a bucket. In this case, infants got A when the experimenter pointed to the left while B to the right. This experiment demonstrates that spatial perception promotes word learning. In contrast, Iverson and Goldin-Meadow (2005) focused on the role of bodily actions and gesturing in particular. They videotaped 10 children who were at the transitional stage from one-word speech to two-word combinations and analyzed the relation between their gestures and language development. They discovered a tight relation between the two, to the extent that lexical items produced initially in gesture are most likely to enter into children's lexicon, and being first in the production of gesture-plus-word combinations with two elements in a proposition also means being first to produce two-word combinations. This result suggests that early gestures, or general bodily actions, pave the way for future language developments.

In addition to the body and bodily sensorimotor experiences, Tomasello (1999, 2009) and Sinha and Jensen de López (2000) amongst a few other studies lay emphasis on how language development is socioculturally embodied. According to Tomasello (1999, 2009), human cognitive and symbolic accomplishments arise from some capacities only in complex social contexts which are probably absent in other animals. If a human child does not have access to social interactions and cultural contexts, s/he cannot develop these accomplishments (Tomasello 2000). Language as one of such accomplishments is built on the basis of human embodied experience too (Tomasello 2009). The sociocultural embodiment of language development is reified by Sinha and Jensen de López's (2000) cross-cultural study on children's conceptualization of the CONTAINER schema through language comprehension or action imitation tasks. They found that children growing up in different cultures develop significantly different conceptualizations of CONTAINMENT. Therefore, children with cultural-specific experience will develop cultural-specific language for spatial conceptualization.

6. Embodied Language Change

Language is dynamic from a diachronic perspective and its form (both phonetic and orthographic form), vocabulary, grammatical system, semantics, and even pragmatics may change over time. Language change most probably follows a specific direction which is arguably universal. The directionality of language change has been realized in different ways, for example, in grammaticalization linguistic constructions always change from free forms to clitics to inflectional morphemes and eventually to zero, or from full phonetic forms to weakened ones, or from concrete and relative objective meaning to abstract and more subjective meaning. This section is chiefly concerned with the directionality pertaining to semantic change, that is, from concrete meaning to abstract meaning. Obviously, concrete meaning parasites on the body and bodily experience. Therefore, embodiment has a clear role in language change (Gibbs 2005).

Heine (1997, 2014) discussed the semantic change of body-part terms and argued that adpositions, reflexive markers, and numerals can find their origins from body-part terms, which is largely typologically universal. For example, there is a cross-linguistic tendency for linguistic terms of 'head' to be grammaticalized into 'up'-terms including 'above', 'up', 'on', etc., which is witnessed in 61% of all Oceanic languages and 87% of all African languages, for terms of 'face' to be grammaticalized into *front*-terms, as is observed in 52.8% of the African and 72.1% of the Oceanic sample languages. Heine (2014) pointed out that 'body'- or 'body part'-nouns provide a main pathway for the rise of reflexive constructions, which is illustrated by the fact that 'body'-nouns in 79.8%, 'head'-nouns in 14.6%, and nouns denoting other body parts in 5.6% of the 89 samples of world languages are grammaticalized into reflexive markers. He further explained that many languages recruit hands and feet to create a numeral. For example, the numeral for *taba:b* '10' in the Papuan language Manambu of the Ndu family is historically derived from the root *ta:b*- 'hand' plus a formative *-a:b*. The semantic change of body-part terms to grammatical categories such as adpositions, reflexive markers, and numerals reflects a directionality from concrete meaning to abstract meaning and it is motivated by conceptual metaphors with the body acting as the source domain. Therefore, it is embodied.

Sweetser (1990) analyzed the semantic change of perception verbs and proposed a possibly universal direction of change from physical sensory perception to mental activities, based on evidence from Indo-European languages. This process is motivated by conceptual metaphors whereby concepts of VISION/HEARING/TACTILE ACTS are mapped onto concepts about INTELLECT. For example, in English the meaning 'intellectually understanding' of *see* is derived from its original meaning 'visually seeing' and underlying this semantic change is the conceptual metaphor UNDERSTANDING IS SEEING. This conceptual mapping is quite dominant in

Indo-European languages and thus motivated similar semantic changes in other Indo-European languages.

The body and bodily experience have been proved vital in creating new grammatical categories and deriving abstract meanings. In this case, language change is embodied, although what role embodiment plays in other aspects of language change than semantic change remains to be verified.

7. Conclusion

Embodiment as a multidisciplinary theoretical construct in nature is becoming a hot topic in various disciplines such as cognitive science, philosophy, psychology, sociology, and linguistics as well. Cognitive Linguistics has built on ideas of embodiment mainly from second-generation cognitive science and embodied philosophy has approached embodiment via language. Cognitive linguists premise that language as part of cognition is not distinguished from general cognition. Therefore, similar to what has been revealed of general cognition, language is also embodied. The embodiment of language has been confirmed in cognitive linguistic research on different linguistic aspects. First, the conceptual system underlying language is embodied because concepts comprising it derive from, and conceptualization structuring it is governed by, the body and bodily experience. Secondly, language processing is accompanied by involuntary bodily behavioral immersion and automatic activation of brain regions responsible for sensorimotor and affective functions, and is therefore embodied. Thirdly, language develops from an early stage of human life in an embodied way in that the body and bodily sensorimotor and sociocultural experience matter much to what and how language is learned. Fourthly, language change, semantic change in particular, manifests a probably typologically universal directionality, that is, extension from semantics concerning the body and physical bodily sensory perceptions and motor actions to abstract semantic categories, which is apparently motivated by embodiment.

However, it should be noted that the embodiment thesis does not remain unchallenged. Some scholars (e.g., Weiskopf 2007; Mahon & Caramazza 2008; Dove 2009, 2011, 2016; Chatterjee 2010; Mahon 2015) are much more circumspect in response to both behavioral and psychoneurological experimental results, cautioning that spreading activation or shared activation might be involved and these do not necessarily rule out the engagement of amodal areas near to perception or action areas, thus the disembodied view. Nonetheless, challenges to the embodiment thesis mean potential breakthroughs for Cognitive Linguistics with regard to the embodiment of language and they lead cognitive linguists to rethink and penetrate into, at least, the following questions: (i) To what extent is language embodied, or which aspects of language are or are not embodied? (ii) Language invokes multimodal systems (i.e., the sensory system, the motor system, the affective system, etc.) but what exact roles do these systems play and how do they coordinate in language processing, language development, and even language change? (iii) What is the role of amodal systems in language and how do they interface with the multimodal systems during language processing, language development, language change, etc.?

Further Reading

Rohrer (2007). Offers an overview of how embodiment is interpreted and how the embodiment hypothesis is developed in Cognitive Linguistics, and attempts to establish a broader theoretical framework for the embodiment hypothesis for Cognitive Linguistics based on achievements gained in the philosophy of cognitive science.

Gibbs (2017). Discusses the embodied nature of meaning by focusing on metaphor (including primary metaphor) and image schema, and introduces neural theory of language and embodied simulation assumption in language understanding.

Bergen (2019). Describes embodiment in Cognitive Linguistics in terms of three phases, that is, the analytic phase, process, and functional role.

Related Topics

image schemas; standard and extended conceptual metaphor theory; concepts and conceptualization; culture in language and cognition

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9
IMAGE SCHEMAS

Dennis Tay

1. Introduction

1.1 What are Image Schemas?

The classic illustration of the concept of image schemas can be found in Mark Johnson's (1987) seminal work on the subject.

> You wake *out of* a deep sleep and peer *out from* beneath the covers *into* your room. You gradually emerge *out of* your stupor, pull yourself *out from* under the covers, climb *into* your robe, stretch *out* your limbs, and walk *in* a daze *out of* the bedroom and *into* the bathroom. You look *in* the mirror and see your face staring *out* at you. You reach *into* the medicine cabinet, take *out* the toothpaste, squeeze *out* some toothpaste, put the toothbrush *into* your mouth, brush your teeth *in* a hurry, and rinse *out* your mouth.
>
> *Johnson 1987: 331; italics mine*

This seemingly trivial description of a morning routine is marked by the repeated use of *in*, *out*, and related forms. It shows how various sensory-perceptual experiences (e.g., seeing, touching, moving) in everyday life occur in a structured way. We move our bodies and other objects out of and into physical containers like rooms and medicine cabinets, crossing occasional boundaries along the way. These recurrent experiences are all different—bodies and rooms are not the same as toothpaste and cabinets—but are similar at an abstract level, and outline a fundamental logic of 'containment'. The subtle point is that we can apply or 'map' this logic not only to less typical 'containers' like covers and robes, but outrightly figurative ones like sleep and stupor—things we cannot literally go in and out of. Another example is the recurrent act of physical travel. The sources, paths, and goals of our physical travels likewise form a coherent logic that can be mapped onto the beginning, process, and completion of non-physical activities. This is why we can speak of 'short-cuts', 'detours', and 'milestones' in our research projects.

Things like CONTAINER and SOURCE-PATH-GOAL[1] are known as image schemas. They are 'imagistic' because they relate to our sensory experiences of the world, and 'schematic' because they generalize over multiple instances of such experiences. Oakley (2007: 215) describes them elegantly as "condensed re-descriptions of perceptual experience for the purpose of mapping spatial

structure onto conceptual structure". There have been many proposed lists and categories of image schemas (Cienki 1997; Clausner & Croft 1999; Gibbs & Colston 1995; Hampe & Grady 2005; Johnson 1987) but none claims to be exhaustive or definitive. Nevertheless, there is general consensus on their psychological reality as conceptual structures. They emerge in the course of child development and form the building blocks of our abstract conceptual representations. Therefore, according to cognitive linguistics, they are also likely to underpin various aspects of linguistic structure.

1.2 Basic Characteristics of Image Schemas

The ways in which image schemas, as conceptual structures, underpin linguistic structure can be seen from their basic characteristics. A fundamental characteristic is that they are formed before other kinds of concepts, and certainly before first language acquisition is complete. We can infer this by observing linguistic variation in the expression of image schemas. For example, English has a single grammatical word *in* to express containment relations. It is optional in English to specify the relation with other content words, but grammatically obligatory in Korean to distinguish 'tight' (*kkita*) from 'loose' containment (*nehta*) (McDonough, Choi, & Mandler 2003). Beneath these differences, however, lies a similar inferential logic of containment. Compared to more substantive concepts like emotions or 'dog', which may require particular culturally mediated experiences, image schemas are directly based on near-universal embodied experiences. Infants 'distil' from repeated episodes of moving along different paths, manipulating different objects, and so on, to form a schematic set of what Mandler and Cánovas (2014) call 'spatial primitives'. In this sense, image schemas are described as pre-conceptual. A related characteristic is that they operate subconsciously; i.e., regardless of infancy or adulthood, we are not usually consciously aware of invoking knowledge of CONTAINERS or PATHS, in the same way as emotions or dogs. We will see later that this has important implications for conceptual metaphor theory (Lakoff & Johnson 1980).

Although image schemas are distilled from basic embodied or sensorimotor experiences, these experiences often combine a range of different sensory modalities. Image schemas are consequently abstract and multimodal at the same time. Evans and Green (2006: 186) explain this with the fact that while we can mentally visualize the details of someone's face or some specific path, it is difficult to visualize an image-schematic abstraction like PATH. This is because the PATH image schema is distilled not only from experiences of walking, but a combination of seeing, hearing, balancing, falling down on paths, and so on. Likewise, our bodily experiences with different specific types of containers, links, physical forces, etc. are multifaceted and contribute in respective ways to the formation and inferential logic of their image-schematic counterparts (e.g., CONTAINER, LINK, FORCE). This is why it is difficult to draw up a definitive list of image schemas, as their multifaceted nature implies that experientially grounded overlaps could always be discerned between them.

As we acquire more experiences with each sensory modality, apparently trivial but rich inferential structures are formed. These inferential structures have inherent or fundamental meaning because the experiences underlying them lead to highly invariant outcomes. For example, an infant crawling in a circle realizes that it always returns to the starting point (alluding to the CYCLE schema), and tying two strings in a knot makes it harder to separate them (the LINK schema). It is interesting to contrast this with the subsequent acquisition of linguistic and pragmatic meanings that are more tied to situational contexts. Vandeloise (1994) offers instructive examples of how inherent meanings underlying the CONTAINER schema show up in acceptability judgments of the preposition *in*. The fact that image schemas have stable inferential structures also means that these structures can be reliably projected, or mapped, for describing and conceptualizing things that are less experientially concrete. Again, this provides a key mechanism for conceptual metaphors, and our CYCLE and LINK examples can be illustrated by expressions like the 'cycle of life' and 'links between friends'.

The inferential richness of image schemas is a statement of the internal complexity. Many image schemas can be analyzed in terms of distinct components, and the relationship(s) among these components are reflected in different levels of language from interactional discourse to grammar. The ubiquitous example of the CONTAINER schema comprises three salient components—an 'interior', 'boundary', and 'exterior'. Movement from the interior to the exterior requires successful overcoming of the boundary in between, as in the earlier example of walking out of the bedroom. Likewise, the SOURCE-PATH-GOAL schema is decomposable into a starting point or 'source', a destination or 'goal', and the 'path' in between. Tay (2013) illustrates a case in psychotherapy where the client's situation is conceptualized in terms of the logical relations between the components of a CONTAINER. Across multiple sessions, vivid and creative language is used to construct a scenario where the client evolved from being 'trapped behind a wall', to 'putting a door in it', and eventually being 'let out'. The componential nature of image schemas is also reflected in the structure of everyday language. In the sentence 'He moved *from* Hong Kong *to* Mainland China *through* the bridge', the three prepositional phrases respectively reflect the source, goal, and path, each able to stand independently (He moved from Hong Kong/ He moved through the bridge/ He moved to Mainland China). The spatial meanings of these components are readily mapped onto a metaphorical sentence like 'He moved *from* a lower position *through* hard work *to* a higher position in the company'. A corollary of the notion of internal complexity is that different image schemas may have overlapping properties, thus forming clusters or networks. This is a key reason why it is difficult to posit a definitive and distinct list of image schemas. Johnson (1987: 45–48), for example, suggests that different schemas like COMPULSION, BLOCKAGE, DIVERSION, ENABLEMENT, and so on comprise a cluster of FORCE schemas. Consistent with cognitive linguistic assumptions, it is important to note that such image-schematic clusters exhibit prototype (Lakoff 1987) rather than taxonomic structure; i.e., members do not all share a set of properties to the same extent, but are rather related to one another like interconnecting nodes in a network.

Lastly, image schemas can demonstrate a dynamic quality in being 'transformed' in ongoing bodily interactions with the world (Lakoff 1987; Talmy 2000). Lakoff (1987) outlines four basic transformations: 'path focus to end-point focus', 'trajectory', 'superimposition', and 'multiplex to mass'. A case of the latter is when seeing a herd of individual cows up close, and then retreating until only an undifferentiated 'mass' of cows is visible. What is essentially the same reality is thus construed in two different embodied ways, the former reflecting the COUNT and the latter the MASS schema. This duality and transformation is manifested in the grammatical distinction between count and mass nouns. Determiners only occur with count nouns (I have a tomato/*I have tomato), but we may construe count nouns as a mass (*I have a tomato all over my face/I have tomato all over my face) (Evans & Green 2006: 186–187). It thus seems that while individual image schemas are associated with stable inferential patterns, there are various interesting dynamic relationships between schemas that are enacted in basic scenarios of everyday language and life.

2. Historical Perspectives

A layperson would probably define 'schema' or the less technical-sounding 'scheme' as something like a template or outline; e.g., color schemes or pension schemes. Since any entity or phenomenon can in principle be 'schematized', cognitive linguistics is far from the first discipline to utilize it as a conceptual construct. The *Oxford English Dictionary* reveals the Greek origin of the word and defines it as 'form' or 'figure'. Schemas featured prominently in the classic study and practice of rhetoric. Oakley (2007: 216) gives the example of antimetabole as a rhetorical schema, where words are repeated in transposed form for rhetorical effect (e.g., *Eat to live, not live to eat*). This transposition provides a formula or template to guide the creation of new examples. The notion of schemas as generalizations over related instances has since been adopted in various interrelated disciplines like philosophy, psychology, cognitive science, and cultural studies (D'Andrade 1995;

Kant 1990; Kemmer & Barlow 2000; Rumelhart 1980), particularly in relation to how the mind organizes information.

Different labels and descriptions such as mediating representations, beta structures, frames, scripts, and cultural models reflect differences in how schemas have been theorized. For example, schemas in Kantian philosophy are bridges between 'pure' non-empirical concepts and concrete sense impressions, while contemporary psychologists see them more like heuristic devices to organize practical information and guide behavior. We may for instance form a 'job schema' distilled from similar (but not exactly the same) experiences at previous jobs that shape expectations and behaviors at the current job.

The cognitive linguistics notion of image schemas has likewise drawn from and interacted with theoretical ideas from various related areas. These include Wertheimer's (1938) gestalt theory, the aforementioned Kantian schemas (1990), as well as other cognitive linguistic cornerstones like Langacker's (1991) cognitive grammar, Talmy's (1988) force dynamics, Lakoff and Johnson's (1980) conceptual metaphor theory, and Grady's (1997) primary metaphor theory. As alluded to in the previous section, what makes image schemas 'imagistic' is the fact that they are mental representations abstracted from experiences across different sensory modalities—auditory, visual, olfactory, gustatory, haptic, and so on. An example of how image-schematic logic figures in cognitive linguistic analysis can be seen from standard cognitive grammatic accounts of prepositions like *from* and *to*. These are typically theorized as 'symbolic structures' (Langacker 1999) that can take on highly specific and concrete meanings (e.g., from my house to the school) as well as more schematic meanings across different conceptual domains like time (e.g., from today to tomorrow). This meaning extension, or polysemy, is analyzable as sanctioned by the SOURCE-PATH-GOAL image schema. Another example is Talmy's force dynamics theory (1988, 2000) which argues that languages distinguish constructions in terms of underlying patterns of interacting forces. For instance, *John doesn't go out of the house* and *John can't go out of the house* differ in that the former simply describes an objective state of affairs, while the latter implies that John wishes to go out but "there is some kind of force or barrier opposing that tendency" (Talmy 1988: 52) that is stronger than John's wish. Force-related image schemas and their metaphorical extensions thus provide a ready descriptive apparatus in that regard. Furthermore, the conceptual domains underlying many of Lakoff and Johnson's conceptual metaphors and Grady's primary metaphors can be seen as possessing image-schematic structures that constrain possibilities for cross-domain mappings. The invariance principle (Lakoff 1990, 1993) in particular states that metaphorical mappings preserve the image-schematic structure of the source domain in a way that is consistent with the inherent structure of the target domain. This is why *she gave him a headache and he still has it* is fine but *she gave him a kiss and he still has it* is pragmatically odd (Kövecses 2010)—the image-schematic structure of the source domain comprises giving someone a physical object. Since physical objects in the source have a permanent quality, the mapping is more apt if the corresponding target also has a (relatively) permanent quality. We therefore see that different cognitive linguistic constructs share a theoretical ecology underpinned by convergent ideas like schematization, categorization, and meaning transfer, that reflect a fairly coherent narrative in the historical development of the field. The different applications this has led to will be elaborated in the following sections.

3. Critical Issues and Topics

Both senses of 'critical' will be discussed in this section. The first refers to applications of the concept of image schemas that have brought new perspectives on issues and topics in language and related fields. This section will focus on relatively well-established applications, while the following section will describe more recent and ongoing attempts. The second sense of critical refers to controversies and debates regarding the notion of image schemas, mostly pertaining to their underlying psychological reality and sociocultural rather than purely embodied origins.

The various critical applications of image schema theory can be divided into several areas. First, as described above, image schemas have figured prominently across different levels of language analysis in cognitive linguistics. Although the traditional notion of discrete structural levels in language is itself contested by cognitive linguists, we can still observe fairly distinct emphases on the relationships between image schemas and grammar, semantics, and semantic-pragmatic phenomena like metaphor. Image schemas are fundamental to the basic tenets of cognitive grammar (Langacker 1991, 1999), which theorizes all linguistic structures as meaningful to varying degrees of schematicity. Schemas related to basic domains like space and physical force are, to cognitive grammarians, critical in organizing the relationships between different types of linguistic structures and their underpinning conceptual domains. Appealing for a moment to the traditional distinction between grammar and semantics, or structure and meaning, image schemas have also contributed to the study of issues and topics like Idealized Cognitive Models (ICMs), polysemy, semantic change, and grammaticalization. ICMs (Lakoff 1987) are cognitive semantic models that reflect our subjective construal rather than objective knowledge of the physical and social world. 'Image-schematic ICMs' are recognized as the most concrete subtype of ICMs, and play an important role in structuring and scaffolding knowledge acquired on the basis of embodied experiences in early life. Numerous examples of polysemous words and constructions across languages have also been observed as not only motivated, but often pervaded by image schemas and their transformations. The languages range from typical research targets like English (Brugman 1981), Russian (Cienki 1998), Swedish (Ekberg 1995), German (Smith 2002), and Chinese (Wang & Su 2015), to relatively under-researched ones like Tepehua (Watters 1995). Cienki (1998), for example, argues that the polysemous s*traight* in English and Russian can be accounted for by metaphoric extensions from its literal and image-schematic sense to other domains like speech, behavior, and thought (a *straight* answer). Moving from synchrony to diachrony, similar mechanisms implicating image schemas have also been used to account for semantic change and grammaticalization. However, in cases of meaning change that move beyond polysemy to the development of distinct senses, there are debates regarding the extent to which image-schematic structure underlying the original sense is preserved in the new sense (Sweetser 1988). Matsumoto (1995: 294) for instance shows that the Japanese causal marker *ni-yotte* "involves changes in the directionality in image schema" when developing its causal sense, and speculates that the same may be true for English complex cause prepositions like *thanks to*, *due to*, and *owing to.* Rhee's (2002) account of semantic change of the English preposition *against*, on the other hand, demonstrates preservation of image-schematic structure and thus presents a stronger case for the role of image schemas in semantic change. Metaphor represents yet another level of language analysis that has been closely linked to image schemas. A basic tenet of conceptual metaphor theory is that the source domains of conventional conceptual metaphors are grounded upon embodied experiences (Lakoff & Johnson 1999), and provide internally rich inferential structures for mapping onto target domains. Image schemas, as recurrent systematic patterns of embodied experiences, can thus be theorized to provide both content and structure to the source domains of many conceptual metaphors like GOOD IS UP, BAD IS DOWN, STATES ARE LOCATIONS, CAUSES ARE FORCES, and so on. Both conceptual metaphors and image schemas also ostensibly operate at the level of the 'cognitive unconscious' (Lakoff & Johnson 1999: 11), in that they can shape conscious thought and behavior, including language use, without our explicit awareness. Furthermore, because conceptual metaphors are claimed to underlie our understanding of a vast array of target concepts, image schema theory has been implicated by association in studies of other subject areas like philosophy, politics (Lakoff 1996), political economy (Narayanan 1999), and mathematics (Lakoff & Núñez 2000). These studies highlight the role of image schemas and metaphors in structuring logical reasoning in their respective target domains. In particular, work by Narayanan (1997, 1999), Feldman (2006), Lakoff (2014), and others, which aims toward a 'neural theory of language', shows that such reasoning processes have a direct neural grounding and can be computationally modeled. These ambitious ideas are not without controversy, however, and have

been criticized for overlooking relevant perspectives in philosophy, artificial intelligence, and cognitive science (Anderson 2003; Haser 2005).

Other diverse issues and topics to which image schema theory has been productively applied include literary analysis, the study of rhetoric and gestures, and language acquisition.

Lakoff and Turner (1989) attempted to show that poetic or literary metaphors ultimately draw from and elaborate the same conventional conceptual metaphors and image schemas we 'live by' everyday, thus outlining a cognitivism approach to literary interpretation alongside the more general field of cognitive poetics (Semino & Culpeper 2002; Stockwell 2002). An important implication of this approach is that literary interpretation is not wholly ad hoc but grounded in, or constrained by, systematic image schemas and metaphors—as demonstrated by Freeman (1995) in his case study of *Macbeth.* Related to literary stylistics is the study of rhetoric, or the persuasive effects of discourse. Oakley's (2005) analysis of 'force-dynamic tactics' in speeches by George Bush and Abraham Lincoln reveals that the same types of image-schematic reasoning that guides literary interpretation also manifests in the strategic construal of relationships between political entities like the government, terrorists, other countries, and so on. Literary appreciation and verbal persuasion—traditionally or stereotypically seen as artful, aesthetic activities—are from the cognitive linguistic perspective grounded upon a common substrate of embodied reasoning structures instead. A similar view extends to the study of gestures—a key paralinguistic phenomenon also often seen as "free and reveal(ing) the idiosyncratic imagery of thought" (McNeill 1992: 1). The basic idea is that gestural actions, as multidimensional movements in space that both encode and structure meanings, can be seen as directly embodying image schemas (Cienki 2005; Mittelberg 2018). Direct correspondences between gestures and image schemas include the notion of CONTAINMENT with a cupped hand, PATH by tracing a line through the air, BALANCE and GRAVITY by downward shifts in body posture, and so on, all of which may also be used to signal metaphorical meanings. Mittelberg (2018) in particular attempts to demonstrate what she calls the 'semiotic reality' of image schemas as manifested through gestures; i.e., image schemas are not merely abstract inferential structures, but actively instantiated as spontaneous and observable patterns of communicative action. Lastly, the notion of image schemas has informed theory and research in the cognitive and pedagogical aspects of both first and second language acquisition. Littlemore (2009) provides a broad overview of the potential of cognitive linguistics, including image schema theory, to support second language learning and teaching. Among the many empirical studies, Tyler (2008) showed that students were better able to learn the differences between the deontic senses of *can*, *must*, and *should* when instructed on the force dynamic aspects of these verbs compared to a control group using traditional textbook explanations. Pan (2019) reported similar findings from a study on young Chinese learners acquiring English idioms using conceptual metaphors, motivated by image schemas, versus a traditional memorizing translation approach. Because of the canonical association between cognitive development and first language acquisition, the mediating role of image schemas has also been a subject matter of considerable debate. Sinha and Jensen de López (2000), for instance, affirm the role of image schemas in developing conceptual understandings and their linguistic correlates in early life, but also emphasize the need to consider "cognitive differences induced by cultural embodiment" (Sinha & Jensen de López 2000: 47). Their argument derives from cross-cultural studies of English, Danish, and Zapotec-acquiring children, which demonstrate culture-specific patterns and biases in the acquisition and use of locatives.

This brings us to the second sense of 'critical', which is about controversies surrounding the basic assumptions and approaches of image schema theory. They revolve around the observation that image schema theorists, and cognitive linguists in general, tend to rely on individual intuitions about language to construct theories about cognition. These theories are then often used in circular fashion to explain language use (Gibbs & Perlman 2006; Kennedy & Vervaeke 1993). Cognitive linguists therefore need to show that image schemas have cognitive psychological reality—in other words, there should be empirical evidence independent of language to demonstrate their role in

cognition. Gibbs and Colston (1995, 2006) acknowledge this criticism and provide a useful overview of experimental research in cognitive psychology, developmental psychology, and psycholinguistics that has lent support, directly or indirectly, to the theoretical notion of image schemas. They also suggest that image schema theory should go beyond experimental data that happens to be consistent with it, to make specific and falsifiable predictions about language and behavior. A related criticism in this regard lies with the perceived lack of precision in defining the various types of image schemas. It was mentioned at the beginning of this chapter that there is no definitive list. According to Haser (2003, 2005), the problem stems partly from the general vagueness of cognitive linguistic theorization, as well as the lack of detailed investigation into how exactly abstract image schemas are supposed to underlie linguistic phenomena like metaphors. Some researchers have also argued that traditional image schema theory advanced by cognitive linguists overlooks developmental as well as cultural and contextual nuances in language, cognition, and body practices. Various theoretical proposals such as 'socio-cultural situatedness' (Frank 2008), 'situated embodiment' (Kimmel 2005), 'mimetic schemas' (Zlatev 2007), and 'complex primitives' (Correa-Beningfield, Kristansen, Navarro-Ferrando, & Vandeloise 2005) have expressed the common counter-argument that the type of embodied experience described in cognitive linguistics is overly abstract and 'universalist', and ignores important nuances or sources of variation stemming from social, cultural, linguistic, and interactional conventions in different real-world settings. From a developmental psychological perspective, Mandler and Canovas (2014) argue that image schemas need to be further differentiated from two other types of cognitive structure, 'spatial primitives' and 'schematic integrations', which are respectively acquired before and after them. As alluded to above, their main argument is that a reliance on linguistic examples makes us fail to properly distinguish between verbal and preverbal understanding. It is the latter which suggests that pre-linguistic schemas are strictly spatial in nature and need to be differently classified from non-spatial schemas like FORCE.

4. Current Contributions and Research

Exciting recent contributions are paving the way for new areas of research and application for image schema theory. These new ideas are mostly cross-disciplinary and are in various stages of development. This section highlights two promising areas that might be relatively unfamiliar to linguists—design and psychological counseling—and the next section on future directions will attempt to envision the next steps to take in these areas.

The basic idea behind applying image schema theory to design—in particular, product and interface design—is that products may be more intuitive and inclusive if their use somehow involves the activation of patterned embodied experiences that are invariant across cultures; i.e., different consumer populations. Using image schemas in design may thus "alleviate the tensions between intuitive use, inclusiveness, and innovation" (Hurtienne, Klöckner, Diefenbach, Nass, & Maier 2015: 239). They also show how "transfer of inspiration from human-human … to human-machine interaction and cooperation" (Baltzer, López, & Flemisch 2019) can take place in the field of design. For example, the zooming function of cameras intuitively activates the NEAR-FAR schema (Kuhn & Frank 1991), and people's descriptions of their interactions with smart phones make constant reference to VERTICALITY and DEPTH, suggesting that it might be strategic to align interface design accordingly (Britton, Setchi, & Marsh 2013). User feedback analyses further show that successful use of image schemas in human-machine interactions correlates positively with favorable evaluations of the product (Asikhia & Setchi 2018).

It has also been suggested that image schema-related ideas can apply across the entire cycle of a 'human-centered' design process (Hurtienne, Weber, & Blessing 2008)—from specifying requirements to producing design solutions to evaluation. Proponents of this approach therefore urge designers to find different ways to tap into consumers' image-schematic models and instantiate them in innovative, useful, and multimodal interface concepts.

Psychological counseling (or psychotherapy) is another area in which image schemas and the closely related conceptual metaphors have recently been researched and applied in different ways. Defined as the "application of clinical methods and interpersonal stances … for the purpose of assisting people to modify their behaviors, cognitions, emotions, and/or other personal characteristics in directions that the participants deem desirable" (Norcross 1990), psychological counseling is an exemplary context where abstract topics are purposefully conceptualized, expressed, and negotiated between speakers. This also implies that phenomena like image schemas and metaphors should not only be described for discourse analytic ends, but further theorized and applied to meet practical needs (McMullen 2008; Tay 2013). For example, if certain emotional states (e.g., anger) do tend to be metaphorically depicted in certain ways (e.g., heat) (Geeraerts & Grondelaers 1995; Kövecses 2000), there is reason to hypothesize that elicited or observed depictions could have complementary diagnostic value. This is demonstrated by how epileptic seizure patients tend to describe their seizures as agents or forces, while non-epileptic seizure patients prefer spatial metaphors for the same topic (Plug, Sharrack, & Reuber 2009). A similar argument is advanced by Yu and Tay's (2020) study of how anger, anxiety, and depression tend to be conceptualized by different image schemas in spontaneous psychotherapy talk. Beyond diagnosis, there are also psychotherapeutic settings where the type of bodily experiences described in image schema theory have more immediate relevance. Patients performing common bodily exercises like breathing or sand play (Deligiannis 2018; Tay 2017) may activate corresponding image-schematic inferential structures as a platform for discussing more abstract topics. The same applies to cases where bodily experiences are themselves a focal topic of therapeutic discussion, like the case of earthquake survivors. A literal and seemingly banal utterance like *I felt the ground shaking beneath me* can have its potential metaphoricity exploited by therapists who go on to explore how other aspects of life are consequently 'shaken' (Tay 2014; Tay & Jordan 2015). Yet another avenue of engagement for image schema theory is in terms of how its fundamental premises offer new insights to traditional psychoanalytic concepts like archetypes and transference (Knox 2001; Merchant 2016; Tay 2016). Knox (2001), for instance, argues that image schemas explain the formation of 'unconscious working models' that are theorized to pattern or 'transfer onto' clients' expectations and perceptions of the present. Most importantly, image schema theory acknowledges the role of environmental stimuli and cues, thereby advancing traditional (e.g., Jungian) conceptions of such models as innate, or inherited from the 'collective unconscious'.

5. Future Directions

One of the most concrete future directions for image schema theory in the field of design lies with its implementation across multiple envisioned real-world scenarios of human-machine cooperation. This requires the development of 'interaction pattern languages' (Baltzer et al. 2019) that comprehensively describe the connections between image-schematic target domains, or 'internal states', and the potential embodied experiences afforded by design interfaces that can modify the perception of these states. Feasible areas of implementation currently include (partially) automated vehicle driving, braking systems, truck convoys, and in principle any other domain that emphasizes cooperative guidance and control between human and machines, such as computer gaming. Linguistic information continues to be relevant in these future areas of application not only as background databases of image schemas and their mappings, but also in terms of verbal data like spontaneous user utterances and interface scripts.

As for psychological counseling, there is much scope to move beyond the aforementioned areas of diagnostic potential, discourse analytic description, and theoretical construction. A critically under-researched aspect is the reception and effectiveness of image schema-related interventions; e.g., how clients understand and evaluate their use, and the relationships between image schemas and various therapy processes and outcomes (Crits-Christoph Gibbons & Mukherjee 2013). Image

schemas are in principle a finite set and hence potentially more tractable than proliferative conceptual metaphors. Therefore, practitioners could also think about designing image schema-related protocols aimed at guiding clients to develop initial image-schematic conceptualizations in more systematic ways. Such protocols would resemble what has been done for conceptual metaphors (Kopp & Craw 1998; Sims & Whynot 1997). Besides looking out for potentially useful spontaneous metaphors uttered by clients, therapists can likewise pay attention to 'image schematic cues' (Tay 2013) like spatial prepositions that provide a pathway towards collaborative elaboration.

Note

1 Image schemas are conventionally presented in small capitals in the cognitive linguistics literature.

Further Reading

Hampe and Grady (2005) is an excellent edited volume focusing on the role of image schema theory in cognitive linguistics. On the other hand, Gallagher (2006) provides a more general interdisciplinary account of how bodily experiences contribute to cognition, of which image schemas are a fundamental part.

Related Topics

cognitive semantics; cognitive grammar; construction grammar and frame semantics; embodiment; standard and extended conceptual metaphor theory; force dynamics; grammaticalization, lexicalization, and constructionalization; cognitive poetics and the problem of metaphor; cognitive linguistics and gesture; cognitive linguistics and second language acquisition

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10
CATEGORIZATION

Xu Wen and Zhengling Fu

1. Introduction

There are many ways in which people organize knowledge. And one way is to form categories. An essential aspect of human cognition is the ability to categorize: *to judge that a particular thing is or is not an instance of a particular category*. "The mental process of classification is called categorization, and its products are the cognitive categories" (Ungerer & Schmid 2006: 8). Categorization is ubiquitous. We are categorizing and using categories all the time. For example, when people get to know things, usually they first ask a question such as "What's this?" This question is actually about how to classify entities, objects, and some other phenomena into categories. Any research field needs to classify things into categories. Indeed, categories and "kinds" have been the center of much attention at least since Aristotle. And there is no doubt that the most influential thinker in the domain of categorization was Aristotle.

The act of categorization is one of the most basic human cognitive activities. Every time we see something as a kind of thing, for example, a bird, we are categorizing. Whenever we reason about kinds of things—chairs, nations, illnesses, emotions, any kind of thing at all—we are employing categories. And any time we either produce or understand any utterance of any length, we are employing dozens if not hundreds of categories: categories of speech sounds, of words, of phrases and clauses, as well as conceptual categories. Therefore, the ability to categorize enables us to interact with our environment without becoming overwhelmed by its complexity.

As a basic cognitive ability to see sameness in difference, categorization plays a very important role in the process of human beings' continuous understanding and transformation of the world they depend on. "The ability to categorize is indispensable in using previous experience to guide the interpretation of new experience: without categorization, memory is virtually useless" (Jackendoff 1983: 77). George Lakoff (1987: 6) even claims that

> Without the ability to categorize, we could not function at all, either in the physical world or in our social and intellectual lives. An understanding of how we categorize is central to any understanding of how we think and how we function, and therefore central to an understanding of what makes us human.

Linguistics is intimately concerned with categorization both in its methodology and in its substance, just as Labov (1973: 342) points out: "If linguistics can be said to be any one thing it is the study of categories: that is, the study of how language translates meaning into sound through the categorization of reality into discrete units and sets of units." Linguistics is related to categorization on two levels. On the one hand, linguists need categories in order to describe the object of investigation. For example, word classes are categorized into nouns, verbs, adverbs, adjectives, etc., and grammatical classes into words, phrases, clauses, and sentences. Sentences are classified into declarative, interrogative, imperative, and exclamatory sentences. And speech acts are classified into locutionary act, illocutionary act, and perlocutionary act by J. L. Austin (1962). On the other hand, linguists are concerned with categorization at another level. "The things that linguists study—words, morphemes, syntactic structures, etc.—not only constitute categories in themselves, they also stand for categories" (Taylor 2003: 1).

Rosch pointed out that human categorization is not "the arbitrary product of historical accident or of whimsy but rather the result of psychological principles of categorization" (Rosch 1978: 27). Rosch proposes two general and basic principles of human categorization. One is the principle of cognitive economy, which asserts that "the task of category systems is to provide maximum information with the least cognitive effort". The other is the principle of perceived world structure, which asserts that "the perceived world comes as structured information rather than as arbitrary or unpredictable attributes" (Rosch 1978: 28). Rosch's aim is to account for the categories found in a culture and coded by the language of that culture at a particular point in time, namely, the formation of the categories in a culture.

In 1987, Lakoff's book *Women, Fire and Dangerous Things: What Categories Reveal about the Mind* opened the door to categorization in cognitive linguistics, and since then categorization has become a major topic in cognitive linguistics. This work is considered as one of the two Bibles of cognitive linguistics, and the other is R. Langacker's *Foundations of Cognitive Grammar*. In addition, John Taylor's book *Linguistic Categorization: Prototypes in Linguistics Theory* (2003) is a comprehensive one which applies prototype theory in many aspects of language such as phonology, morphology, syntax, and syntactic constructions.

Based on the previous studies, this chapter will elaborate categorization and relevant theories, including different perspectives on categorization, levels of categorization, decategorization, the Chinese view of categories, and current contributions.

2. Four Major Theories of Categorization

As the most basic and important cognitive activity, categorization arouses interest, attention, and diverging viewpoints. Categorization has undergone different development with the following four famous categorization theories.

2.1 The Classical Theory

There are two reasons why the classical theory of categorization is classical: (1) It can be traced back to the ancient Greek philosopher Aristotle; (2) It dominated psychology, philosophy, and linguistics, especially autonomous linguistics, for most of the 20th century.

The Aristotelian ("scholastic" or "classical") tradition or theory has the following basic assumptions:

(i) Categories are defined in terms of a conjunction of necessary and sufficient features.
(ii) Features are binary.
(iii) Categories have clear boundaries.
(iv) All members of a category are of equal status.

According to the classical theory, the features are necessary in that no entity that does not possess the full set of features is a member of the category, and they are sufficient in that possession of all the features guarantees membership. To illustrate, the category BACHELOR may be defined by the features [+HUMAN] [+ADULT] [+UNMARRIED] [+MALE], and SPINSTER by [+HUMAN] [+ADULT] [+UNMARRIED] [-MALE].

There is no difference in typicality among members in a category, i.e., there is no member which is more representative than others. The theory provides a clear and rigid criterion to identify a category. Any entity with all the characteristics of a category is a full member of that category; any entity that does not have all defined features is not a member. For example, all kinds of birds such as *sparrow*, *swallow*, *robin*, *penguin*, *ostrich*, *kiwi*, and *duck* are members of the category BIRD.

The classical view that categories are based on shared properties is not entirely wrong. We often do categorize things on that basis. But that is only a small part of the story. There are some difficulties faced by the classical theory of conceptual categories. Three frequently cited shortcomings have provided the major motivation for the development of alternative theories.

First, category judgment based on necessary and sufficient features is not available for many everyday concepts such as GAME and BACHELOR. As mentioned above, a classical model analysis of BACHELOR is a HUMAN +ADULT+UNMARRIED+MALE. This definition may suit most normal cases. But there are a number of cases where speakers react with uncertainty as to whether the person involved is a bachelor or not, e.g., the Pope, Tarzan, an adult male living with his girlfriend, and a male homosexual.

Secondly, for some categories, the goodness degree of all members is not the same. Some members of a category are judged "better" or "more representative" than others. For example, in the BIRD category, robin and sparrow are better members than ostrich and kiwi.

Thirdly, the classical theory can offer no account of why category boundaries, in fact, seem to be fuzzy and variable. For example, there is no clear cut between GAMBLING and AMUSEMENT, and between MOUNTAIN and HILL.

2.2 Prototype Theory

Several theories of categorization have been proposed, mostly in the psychological literature, but the theory that has had the most influence on the development of cognitive linguistics is undoubtedly prototype theory. On the way to prototype theory of categorization, a most crucial step was taken by the anthropologists Brent Berlin and Paul Kay (1969). They found that the so-called focal colors were what we rely on for color categorization. Focal colors are shared by speakers of the same language and even across different languages. Eleanor Rosch set out in the 1970s to explore the psychological background of focal colors, aiming to find out evidence whether focal colors were rooted in language or in pre-linguistic cognition. Rosch's research provided empirical evidence that focal colors are perceptually more salient than non-focal ones, and boundaries of neighboring categories do not seem to be clear-cut, but fuzzy.

Linguists set out to investigate other areas for similar phenomena, e.g., FURNITURE, FRUIT, CLOTHING, WEAPON, etc. Best examples exist for many different categories, which come to mind first and are more typical than others. Such central examples are termed prototypes. Evans (2007: 175) defines a prototype as a relatively abstract mental representation that assembles the key attributes or features that best represent instances of a given category. In contrast with the classical theory, prototype theory holds the following principles (Geeraerts 1989):

(i) Prototypical categories exhibit degrees of typicality; not every member is equally representative for a category.
(ii) Prototypical categories are blurred at the edges.

(iii) Prototypical categories cannot be defined by means of a single set of criterial (necessary and sufficient) attributes.
(iv) Prototypical categories exhibit a family resemblance structure, or more generally, their semantic structure takes the form of a radial set of clustered and overlapping readings.

To sum up, we can say that a prototype is the best example of a category, which serves as the cognitive reference point of mental representation. When we talk about a category, we are actually having the prototype in our mind. Take the concept MOTHER for example (Lakoff 1987): When talking about mother, the central case is being evoked, that is, a mother who is and always has been female, and who gave birth to the child, supplied her genes, nurtured the child, is married to the father, is one generation older than the child, and is the child's legal guardian. This is the prototypical mother with no cultural difference. In addition to this, there are also many other kinds of mothers. STEPMOTHER refers to the person who didn't give birth or supply the genes, but is currently married to the father. After that, there is ADOPTIVE MOTHER, who didn't give birth or supply the genes, but she is the legal guardian and has the obligation to provide nurturance. There is also BIRTH MOTHER, who gives birth and puts the child up for adoption. Besides, we have FOSTER MOTHER, SURROGATE MOTHER, UNWED MOTHER, GENETIC MOTHER, etc. (Lakoff 1987). With the various examples of MOTHER, it is easily concluded that prototypical examples are what we think of first, which play an important role in default reasoning. Prototype theory can show its advantage in the following aspects:

(i) Prototype theory is useful for explaining how people deal with untypical examples of a category.

Prototype theory provides room for untypical members of a category, such as pelicans and penguins in the BIRD category, which are sufficiently like the prototype, but do not have all the characteristics.

(ii) It can explain how people cope with damaged examples.

Why people could categorize a one-winged robin who couldn't fly as a bird is a difficult problem for the classical theory, but prototype theory can cope with this problem easily.

(iii) Furthermore, the prototype effect seems to work for actions as well as objects or organisms.

Murder is considered to be a more representative example of *killing* than *suicide* or *execute*, and *stare* is a better example of *looking* than *ogle*, *squint*, or *peer*.

(iv) We can use prototype theory to deal with the way in which humans cope with individual words.

The following example is used to prove that words may be used in their untypical sense:

(1) a. I must have seen that a dozen times, but I never noticed it.
b. I must have looked at that a dozen times, but I never saw it.

Usually when we *see* something, our gaze goes to an object and the object enters our awareness. The word *see* in (1a) has one part of the meaning and lacks the other part, which is an unprototypical usage (Jackendoff 1983).

(v) Prototype theory can be used to explain constructions such as "negative constructions".

(2) a. I have never been to Canada.
b. He hasn't finished the job.
c. Her voice was so slow, we could barely hear her.
d. The task is beyond me.

The group of negative constructions can be better explained with the help of prototype theory. (2a) and (2b) are prototypes of negative constructions, because the typical negative words "never" and "not" are used; whereas (2c) and (2d) are atypical negative constructions because (2c) is partially negative, and (2d) is formally affirmative but semantically negative.

(vi) Prototypes apply also to abstract ideas, such as a week (Fillmore 1982).

In most countries, a week is thought of as five working days, Monday to Friday, followed by two rest days, Saturday and Sunday; whereas an Inca week has nine working days followed by market day, on which the king changed his wives.

In addition to the advantages above, prototype theory may have some shortcomings:

(i) Prominent features or simplistic features

The major criticism that prototype theory faces is that the prominent features are far from enough and too simplistic. The criterion of feature is the prototype model's advantage but also its shortcoming. The reason lies in the fact that this model fails to handle context sensitivity. The best example of a category may differ when a context is indicated (Barsalou 1987).

(ii) Best example or confusing example

When necessary and sufficient features can be clearly provided, especially for technical terms, such as odd number in mathematics, the judgment by centrality or prominent features is confusing instead.

(iii) Fuzzy boundaries

"There is no fixed limit on how far something can depart from the prototype and still be assimilated to the class, if the categorizer is perceptive or clever enough to find some point of resemblance to typical instances" (Langacker 1991: 266). Although several linguists and psychologists acknowledge its existence (including Lakoff), little effort was made to reveal the boundaries' location. "The location of the boundary of a category is independent of its prototype, that is to say, two categories may have the same prototype but different boundaries; likewise, two categories may have the same boundaries but different prototypes" (Croft & Cruse 2004: 90). For example, the French word *corde* and its default English translation *rope* have the same prototype but different boundaries. While the English words *courage* and *bravery* have the same boundary but a different core. Consider the following sentences (Croft & Cruse 2004: 91):

(3) a. A person jumps into a fast-flowing river in an attempt to save someone who has fallen in.
b. A person risks his/her career and livelihood by exposing malpractice and injustice at the heart of government.

(3a) was proved to be the better example of bravery while (3b) the better one of courage.

2.3 The Theory of Idealized Cognitive Models

George Lakoff (1987) set out to develop a theory of category structure from the perspective of cognitive linguistics which can explain the empirical findings presented by Rosch and her colleagues. This theory is called the theory of idealized cognitive models (ICMs).

Lakoff claims that we organize our knowledge in terms of ICMs, and that category structure and prototype effects are just the by-products of that organization. ICMs are complex structured systems of knowledge, and guide cognitive processes such as categorization and reasoning. ICMs structure mental spaces: the conceptual 'packets' of knowledge constructed during ongoing meaning construction. Each ICM is a complex structured whole, a gestalt, which makes use of four types of structuring principles: (i) propositional structure, (ii) image-schematic structure, (iii) metaphoric mappings, and (iv) metonymic mappings (Lakoff 1987: 68). That is to say, ICMs rely on these structuring principles for their composition.

(i) Propositional ICMs

"Propositional" here means that ICMs of this kind are not constructed by 'imaginative devices' (Lakoff 1987: 285) like metaphor, metonymy, or mental imagery. Instead, propositional ICMs consist of elements with properties and relations that hold among those elements. A propositional ICM consists of propositional or factual knowledge. For example, our knowledge of the rules about requesting a table and ordering food in a restaurant comes from a propositional ICM.

(ii) Image-schematic ICMs

According to Lakoff, a fundamental building-block of conceptual structure is the image schema. In many aspects, image schemas are the foundation for conceptual structure. For example, our experience and concepts for SPACE are largely structured by image schemas like CONTAINER, SOURCE-PATH-GOAL, PART-WHOLE, UP-DOWN, FRONT-BACK, and so on. This means that image schemas like these structure our ICM for SPACE.

(iii) Metaphoric ICMs

Metaphoric ICMs are structured by the structural mapping from a source domain to a target domain. For instance, when the domain or ICM of TIME is metaphorically structured in terms of MONEY, as illustrated by such expressions as *You are wasting my time* and *I've invested a lot of time in her*, the ICM for TIME is metaphorically structured.

(iv) Metonymic ICMs

Metonymy is one of the basic characteristics of cognition. It is a way to understand the whole or another part of the whole with a more salient part in the same cognitive domain. The following is one of the best-known cases:

(4) One waitress says to another, "The ham sandwich just spilled beer all over himself."
Here "the ham sandwich" is standing for the person who is eating the sandwich.

ICMs are developed in order to account for prototype or typicality effects as well. Prototype effects relate to the phenomenon whereby an instance is judged as being more or less representative of a certain category or measured by goodness-of-example. For instance, a robin might be judged

to be a representative member of the BIRD category, whereas an ostrich might not be judged as a best example. There are a range of ways in which prototype effects arise, and four basic sources are presented here.

Prototype effects can arise by mismatches between ICMs against which particular concepts are understood. Consider the lexical concept BACHELOR with respect to a MARRIAGE ICM. This ICM is likely to include schematic information relating to age for marriage, a marriage ceremony, the social, legal, religious, and moral dimensions, the institution of marriage, and a standard marriageable age. The concept of BACHELOR is understood based on this ICM. Prototype effects arise when the typical example stands for the entire category. The concept POPE is understood with respect to the ICM of the CATHOLIC CHURCH whose clergy are unable to marry. There is a mismatch between these two cognitive models: In the ICM against which BACHELOR is understood, strictly speaking, the Pope is a bachelor because he is unmarried. However, the Pope is judged to be a poor example of the category BACHELOR, because the Pope involves a CATHOLIC CHURCH ICM instead of a MARRIAGE ICM.

According to Lakoff, cluster models are another way in which prototype effects can arise. Cluster models refer to models consisting of a number of converging ICMs which collectively result in a complex cluster, and it "is psychologically more complex than the models taken individually" (Lakoff 1987: 74). Consider the category MOTHER structured by a cluster model consisting of a number of different MOTHER subcategories. These are listed below.

1) THE BIRTH MODEL: the person who gives birth to the child.
2) THE GENETIC MODEL: the person who contributes the genetic material to the child.
3) THE NURTURANCE MODEL: the person who brings up and nurtures the child.
4) THE MARITAL MODEL: the person who is married to the father.
5) THE GENEALOGICAL MODEL: the person who is the closest female ancestor.

These sub-models compose the category MOTHER, and contribute to the larger cluster model. Each sub-model can contribute to the prototype effects when it is regarded as primary. "They are all mothers by virtue of their relation to the ideal case, where the models converge. That ideal case is one of the many kinds of cases that give rise to prototype effects" (Lakoff 1987: 76).

Prototype effects have a metonymic source when a sub-model is employed to represent a cluster model or a category is represented by a typical member. In other words, metonymic models are used when the part-for-whole relation is involved. Consider the category MOTHER discussed above. Housewife mothers are regarded as more representative than working mothers in traditional cultures. Such goodness-of-example judgments yield prototype effects by a metonymic model in which a subcategory, housewife, stands for the whole category MOTHER. Lakoff (1987: 84–85) lists the characteristics of a metonymic model, which we briefly illustrate here:

(i) There is a target concept "A"; (ii) There is a conceptual structure containing both A and another concept B; (iii) B is either a part of A or closely related to A; (iv) B is either easier to understand, easier to recognize, or easier to get access to conceptually; (v) a metonymic model is one of how A and B are related. When B is used to stand for A, prototype effects arise due to the metonymic model.

Another important source of prototype effects is radial categories. The category is structured radially with a number of subcategories. There are central subcategories and noncentral ones which are extended from the central subcategories and also determined or motivated by them. The radial structure with a category is another source of prototype effects. In the category MOTHER, stepmother and foster mother are never understood on their own terms, but comprehended via the relationship to the central model of MOTHER.

2.4 Vantage Theory

According to Taylor (2003), two major goals are achieved through categorizing: (i) to maintain the stability of the cognitive structure, and (ii) to adapt to novel circumstances. The classical theory meets the first goal by categorizing with necessary and sufficient conditions, but fails on the second goal. Prototype theory achieves the stable status with the best example, or prototype, whereas peripheral members tend to adapt to novel environments. In response to the limitations of existing models, vantage theory (VT) emerged in the 1980s better to meet the requirements in which prototype effects and similarity vs. difference are both modeled.

Vantage theory, proposed by MacLaury, originates from the color domain, but aims to model categorization in all domains. A category may only involve a vantage, one point of view, but MacLaury has found that people may construct an alternative vantage through different emphasis on difference and similarity. An event falls into a category relative to the perspective of a cognizer such that VT holds that points of view give rise to categories, which reflect human needs and motives.

In the color survey, there is a situation beyond being solved by either the classical model or prototype model when a category is named with two terms whose mappings overlap. According to VT, color categories appear with the change of focus. In the initial stage, color is classified based on similarity. For example, many colors based on yellow are not far away from light red, so they are all classified as red; after that, the category yellow is distinguished by different features from red, and gradually developed to become a self-supporting and self-contained category.

In VT, the process of human cognitive classification is completed by analogy of time-space. Determining one's own direction in time and space means drawing one's position relative to the spatial axis and relative to the motion. The spatial axes of up–down, left–right, and front–back in the categorizing process are fixed coordinates, whereas time is a mobile coordinate of reciprocally balanced emphases on similarity or difference. Głaz (2010) indicates that to construct a category is to select an inherent fixed coordinate, focus on the coordinate value, and conceptualize other values as similar or different values. If other values are considered similar to focus, more values are included in the scope of the category; if the emphasis on similarity gives way to the emphasis on difference, a boundary or margin of the category has been encountered. To put it in brief, to construct a category is to plot the fixed coordinate with the mobile ones.

Vantage theory takes advantage of the prototype model and goes beyond it. Vantage theory rests on three fundamental principles: (i) the space-time analogy, (ii) the conception of a category as an assembly of vantages (points of view), and (iii) the categorizer's degree of attention to similarity (vs. difference) as the fundamental cognitive process (Głaz 2013: 250). The vantage model holds that "a category is composed by a deep-seated, unconscious, and automatically expedited analogy to space-time coordinates, which a person processes as fixed landmarks and motion between them" (MacLaury 2013: 68). VT is considered to be capable of handling coextension, which the classical approach to categorization or prototype theory are not capable of doing.

VT was then revised from a theory of categorization to a theory of conceptualization, named VT2, by Allan in 2002. In VT2, vantage is divided into synthetic and analytic vantages, the former focusing on similarity and the latter on difference. In VT2, an analytic subvantage is successor to a synthetic subvantage instead of the simultaneity of VT's dominant and recessive vantages. The grammar of number and quantification in English is exploited to reveal different conceptualizations.

In order to apply VT to linguistic data, VT was also modified into Extended Vantage Theory (EVT), proposed by Głaz (2010). A vantage in VT is an arrangement of coordinates in a series of figure–ground alignments, while in EVT it involves collaboration of three broad parameters, namely the conceptualizer's standpoint, perspective, and the modes of conceptualization. The conceptualizer's standpoint relates to from where the conceptualizer performs the act of conceptualization; perspective refers to what kind of perspective the conceptualizer projects; the modes of conceptualization are also called the viewing modes, referring to how the object is conceptualized.

EVT extends VT from certain aspects of language, cognition, spatiotemporal orientation, and relativity physics to more aspects of linguistic behavior, by which a cognition-based descriptive model of language is established, underscoring the subjective nature of meaning and the active role of the conceptualizer.

3. Levels of Categorization

An object can be categorized at different levels of generality. In everyday life, we can call the wooden object upon which we are sitting by several different names: furniture, chair, or desk chair. We can refer to an animal as a dog, a spaniel, or a cocker spaniel. In other words, an object can belong to many different, related cognitive categories:

(5) a. vehicle—bus—double-deck bus
b. furniture—bed—bunk bed
c. animal—dog—Chihuahua
d. plant—flowering plant—daisy
e. drink—juice—orange juice

Some category levels are called superordinate levels, which means higher level or more general. In the above examples, *vehicle, furniture, animal, plant*, and *drink* are all examples of superordinate category levels. Basic level categories are more specific, but not too specific. *Bus, bed, dog, flowering plant*, and *juice* are all examples of basic level categories. Finally, there are subordinate levels, which means lower level or more specific categories. *Double-deck bus, bunk bed, Chihuahua, daisy*, and *orange juice* in the above example are subordinate categories.

All levels of categories are related to each other in a kind of hierarchical relationship. We call the animals "dogs" as superordinate to terriers, and terriers as superordinate to Scotch terriers and bull terriers; whereas "dogs" are subordinate to mammals, and mammals are subordinate to animals. What makes the same thing on different levels of categories lies in a principle called class inclusion, which models things in a cognitively structured net.

The most important level is the basic level due to the following characterictics:

(i) Basic level categories are the most differentiated from one another, and they are therefore the first categories we learn and the most important in language.

The basic level has the largest differentiation, and also has the largest amount of information. The basic level is the level at which we normally name things, in the absence of reasons to do otherwise.

(ii) Members of basic-level categories have shapes in common.

Category on the basic level can enable people to identify and recognize its characteristics as quickly as possible. For example, people can easily identify dogs and cats, but can't visualize an animal.

(iii) Members of basic level categories have motor movements in common.

Members of the same category can cause people to have the same response in behavior. For example, the related behavioral response produced by cars is to ride and run, and the behavioral response produced by balls is to be rolled.

(iv) Basic level categories have priority in status.

The basic level is the most important foundation of classification. The other two levels are both parasitic categories based on the basic level.

(v) Basic level and prototype categories have a symbiotic relationship.

The basic level can reflect the greatest family resemblance among category members, and it is also the most direct and basic starting point for people to understand the world of entity, and the most powerful tool for people to categorize the objective world. The basic level provides related and digestible information of objects. This information is accumulated in the most complete form in the prototype and is represented by the category name.

The superordinate categories are built on the basic level categories, or they are parasitic on the basic level, so they are also called parasitic categories. The superordinate categories do not have the gestalt of experience, so they are not easy to identify psychologically compared with the basic level categories. Ungerer and Schmid (2006: 77) noted:

> You would probably draw an orange, a banana, etc. to illustrate FRUIT or a chair, a table and a bed for FURNITURE, or a car, a bus and a motorbike for VEHICLE. In other words, you would 'borrow' the gestalt properties of the superordinate category from the basic level categories involved …

The subordinate category is also parasitic on the basic level category, but it has more special and specific attributes than the basic level category. They are closely related to the cultural characteristics of cognitive background, and there are also good samples and bad samples. Generally speaking, concepts on this level tend to have more social and cultural characteristics, and more differences can be found in cross-linguistic comparison. For example, foods in different countries may differ a lot from each other, so the subordinate category of FOOD would be greatly different.

4. Decategorization

Decategorization was first put forward to describe the loss of categorical features of nouns and verbs in the paper "The Discourse Basis for Lexical Categories in Universal Grammar" by Hopper and Thompson in 1984. The paper concludes by suggesting that categoriality itself is another fundamental property of grammars which may directly derive from discourse function.

Decategorization refers to the process of losing categorical features in certain contexts, which finally leads to category-shift. The decategorization of nouns is a good example. "From the discourse viewpoint, nouns function to introduce participants and 'props' and to deploy them" (Hopper & Thompson 1984: 710). Based on this, the decategorization of nouns is considered to include two forms: non-referential forms in a semantic sense and non-manipulable forms. The former, with a wide range of forms, involves the loss of nominal trapping because it fails to refer to a concrete entity, including: incorporation of patient, incorporation of obliques, noun-compounding, predicate nominals, nominals in the scope of negation. Although referring to actual discourse entities, referents of the second form—anaphora and body parts—are unimportant for the subsequent discourse, showing low categorial status. When anaphora shows inability to refer, and when body part nouns are incorporated in other linguistic forms, the categoriality is reduced. For example, *fire* and *buffalo* in (6a) and (7a) function, both syntactically and semantically, as prototypical examples of the noun class, whereas (6b) and (7b) illustrate the partial decategorization of the nouns (Taylor 2003: 219).

(6) a. We made a big fire.
b. We made (*big) fire.
(7) a. We ate the meat from a slaughtered buffalo.
b. We ate (*slaughtered) buffalo meat.

Another important grammatical category commonly undergoing decategorization is the verb class. It is a category which is considered to answer questions like "what happened?" If verbs fail to provide answers, they are decategorized, losing the morphosyntactic trappings of prototypical verbs. Hopper and Thompson (1984) summarized six aspects influencing verbs' categoricial status, including stativity, irrealis, verbs in negative clauses, serial verbs, compound verbs, and dependent clauses. The decategorization of verbs is very obvious in English subordinate clauses in which verbs can be used as infinitives or gerunds. In such a case, verbs lose many of their morphological and distributional characteristics, e.g., agreement with a third-person singular subject, and the ability to be preceded by auxiliaries. Usually, syntactic environment and modality are the two major factors that motivate the decategorization of verbs, the former serving as the external trigger, the latter as the internal motivation to increase the subjectivity of an utterance and change the modality. For example,

(8) a. Nobody could persuade him to change his mind.
b. Nobody enables him to change his mind.
c. Nobody insists on him changing his mind.

The decategorization of nouns and verbs shares some common points, such as losing the referential meaning, failing to accomplish syntactic function, shifting from one category to another. Nothing is unchangeable, except for the change itself. From categorization to decategorization, language is undergoing a dynamic process aiming for cognitive economy and cognitive variety. As humans' most basic cognitive mechanism, metaphor and metonymy play crucial roles in the process of decategorization.

Decategorization is the extended research of categorization, and it may lead to a new type of categorization. The former research has accomplished a lot in this field, but what seems left or unrevealed is the criterion to judge whether a category has been decategorized; because most research on decategorization is still introspective. With empirical evidence on what stage a category is going through, the study on categorization and decategorization would be more reliable and diagnostic and some more intermediate stage could be be found between the two extreme stages—categorization and decategorization.

5. Chinese View of Category

The four theories of categorization above are all from Western culture. These theories emphasize the separation and differentiation of two categories, so they are concerned about how to divide different categories more reasonably and economically, in order to find out the differences between things, and help us build a knowledge system. In other words, the Western categorization is exclusive, that is, a thing can only be a member or nonmember of a category, and it cannot be both. Whereas, Mandarin Chinese has different views of categorization thanks to Chinese traditional philosophy.

5.1 Inclusiveness

The dialectical thinking of Chinese philosophy pays more attention to the unity of opposites, and the fusion of opposites is the most important. The two ends complement each other, and form

opposites. Category inclusion is a characteristic of the Chinese language. This is an excellent heritage of ancient Chinese philosophy, which affects the Chinese's thinking and the Chinese language. Grammatical category and pragmatic category can be the same in form (Shen 2017). For example, *laohu* (tiger) and *ji* (chicken) are nouns and also referential expressions in Mandarin Chinese.

(9) a. laohu shi buru dongwu. (Tigers are mammals.)
b. laohu zai longzi li. (The tiger is in the cage.)
(10) a. ji xiadan. (Chickens lay eggs.)
b. ji pao le. (The chicken ran away.)

(9a) is a generic sentence in which *laohu* is used to refer to the whole TIGER category. (9b) talks about a specific individual tiger or some tigers which are referred to in the context. (10a) is also a generic sentence in which *ji* refers to the whole category, while *ji* in (10b) refers to a specific individual or group of chickens.

Noun and verb are the most basic and important grammatical categories, which are in exclusive opposition in the Western language system. If verbs are used as nouns, they need to go through a process of nominalization. But this is not the case in Mandarin Chinese, because Chinese verbs have the same morphology as Chinese nouns, which have features of both verbs and nouns, so noun and verb are in inclusive opposition. That is to say, nouns constitute a "super-noun category" with verb as its subcategory. All verbs in Mandarin Chinese are in fact verbal nouns. This means that Chinese verbs correspond to both English verbs and English nouns. For example, *si* corresponds to die and death, *zha* corresponds to explode and explosion, *chenggong* to succeed and success, *shengchan* to produce and production, and *shibai* to fail and failure (Shen 2018).

(11) a. chenggong shi xuyao fuchu nuli de. (Success needs efforts.)
b. ta zhongyu chenggong le. (He finally succeeded.)
(12) a. zheben shu de chuban shi youyiyi de. (The publication of this book is meaningful.)
b. zhebenshu chuban le. (This book has been published.)

In the above sentences, *chenggong* and *chuban* in (11a) and (12a) are nouns, but the same words are used as verbs without any morphological change in (11b) and (12b). This phenomenon is a characteristic of Mandarin Chinese, because Mandarin Chinese embraces categorical inclusiveness, which holds that two categories can exist when A contains B.

Since adjectives in Mandarin Chinese can be used as predicates like verbs, such as *zhege zhongyao* (This is important) and *ta congming* (She is smart), Chinese linguists tend to regard adjectives as a subcategory of verb and an intransitive verb: *leng* corresponds to cold and coldness, *e* to hungry and hunger, *kunnan* to difficult and difficulty, *zhongyao* to important and importance, and *congming* to clever and cleverness (Shen 2018).

5.2 Dynamics

In Chinese philosophy dynamics is considered as the essence of all things, and so is language. Chinese people master language in the dynamic, while Westerners analyze language in the static. Because Mandarin Chinese is inclusive and dynamic, nouns can be used as verbs, and verbs as nouns. Mandarin Chinese seldom emphasizes the difference between grammar and usage, between noun and verb, and there is no morphological change in Mandarin Chinese. So categorization in Mandarin Chinese is considered as dynamic. Zhu (1985: 4–5) held that no definite duties and multi-function of different word classes are what differs Chinese from Indo-European languages.

The dynamic feature of Mandarin Chinese lies in the dynamic usage of language. There are multiple syntactic combinations in Chinese sentences. Consider the following examples (Shen 2016):

S=NP+VP wo bu qu. (I'm not going)
maicaide laile. (The one who sells vegetables is coming.)

S=NP+NP xiaowang shanghairen. (Xiao Wang is from Shanghai.)
jintian zhongqiujie. (Today is Mid-Autumn Day.)

S=VP+VP guang ku meiyong. (It is no use crying.)
tanbai caiyou chulu. (Confession is the way out.)

S=VP+NP kanshangqu yige yang. (They look the same.)
Busi (jinnian) zheng yibai sui. (He was 100 years old if he was still alive.)

There are two ways to see the dynamic sentence structure of the Chinese language. One way is that Chinese word classes have multi-functions, so that a certain word class may play its role in different syntactic position; the other way is that when a verb is used as a subject, the verb is in fact nominalized with a covert morphological change. There are different word classes in Mandarin Chinese but the usage is dynamic—verbs can be used as subjects and nouns can be used as predicates. For Mandarin Chinese, language is also grammar. Western linguistic theories have great impact on Chinese linguistic research. Chinese linguists have borrowed Western theories to analyze the Chinese language, only to find that people on earth speak more than one language. What we need to do is not to analyze Mandarin Chinese within the framework of the English language, but to analyze Mandarin Chinese as it is. What we see is what we get.

6. Current Contributions and Research

Categorization is the mental operation by which the brain classifies objects, entities, and events. It is not only a basic ability of the human mind, but also a process of extreme importance in every aspect of human existence. It lies at the heart of virtually all approaches to language research, be they descriptive, theoretical, or cognitive. So in this section, we will briefly explain how categorization is applied in fuzzy linguistics, translation studies, and language learning and teaching.

6.1 Categorization and Fuzzy Linguistics

When people ask "What is this?", this is actually a matter of categorization, a matter of putting a thing into a certain category. We do categorizing based on similarities of things, but sometimes things have multidimensional features, which lead to difficulties in categorization. In such cases, fuzziness may come into being. Fuzzy linguistics or grammar studies such fuzzy linguistic phenomena. Fuzziness is manifested in the fuzziness of the relationship between words and the objects they refer to. For example, long-short, big-small, new-old, tall-short are groups of fuzzy words, because there is no accurate scale for the judgment of being long or short, and big or small, etc. The season terms of spring, summer, autumn, and winter are also fuzzy, because there is no clear cut between different seasons. The boundary between vegetables and fruits is fuzzy in different cultures. Potatoes fall into the category of vegetables in China and some other countries, but not in Germany (Wu 1999). Terms of address in different cultures may also lead to fuzziness. For example, the word *uncle* in English may refer to such Chinese counterparts as *jiujiu*, *shushu*, *dabo*, *gufu*, and *yifu*.

Grammatical structures are also fuzzy to some extent. "Grammar is to some extent an indeterminate system. Categories, structures, for example, often do not have neat boundaries" (Quirk et al. 1985: 90). The fuzziness of grammatical structures refers to the fact that the boundary between one structure and another is fuzzy.

The continuity of things is the most important source of fuzziness. People divide things into different categories, but the division is subjective and artificial. The truth is that things can be divided, but the continuity exists, which leads to fuzziness. The diversity and variability of the world also lead to the fuzziness of grammatical categories. Things are changing in the world, but the language is relatively static and the artificial division or categorization is hardly neat and clear. Categorization reflects people's understanding of the world. With the changing of the world, categorization may undergo recategorization so as to match the world.

How does the fuzziness of language come into being? There are different viewpoints on this question. So far, the following views are generally shared by most linguists:

(i) The fuzziness of language comes from the fuzziness of entity boundary.
(ii) Human language has the feature of generality.
(iii) People use language inconsistently and loosely.
(iv) People lack a clear understanding of the entity.

Fuzziness is the result of categorization, because there is no fuzziness for entities themselves. Fuzziness is not the disadvantage of language at all, but rather it has some advantages:

(i) It increases the efficiency of linguistic expression.

Fuzzy language can convey enough information with fewer expressions, as outline and abstract can do. Here the efficiency of expression is similar to what Rosch called "cognitive economy". "As an organism, what one wishes to gain from one's categories is a great deal of information about the environment while conserving finite resources as much as possible" (Rosch 1978: 28).

(ii) It improves the accuracy of linguistic expression.

This seems to be contradictory to the characteristics of fuzziness. Because of the uncertainty of things themselves, it is more accurate to express them in fuzzy language, which is the dialectical unity of fuzziness and precision.

(iii) It increases the flexibility of linguistic expression.

In verbal communication, due to the subjective and objective factors such as topic, language environment, etc., in order to avoid speaking too absolutely, the speaker often uses fuzzy language to achieve his/her communicative purpose.

(iv) It makes speech more euphemistic, implicit and polite.

There are a lot of fuzzy expressions in politics and foreign affairs activities, whose purpose is to make the words more euphemistic and implicit. Especially for some sensitive topics, the use of fuzzy language can often play a role of concealment or avoidance. Sometimes, the use of fuzzy language is entirely out of consideration of the politeness principle, which is beneficial to both parties of communication.

(v) It makes speech more vivid.

Being precise never means being vivid. Literary works need fuzzy language. Otherwise, literature will lose its beauty.

As categorization is one of the most important and basic topics in language, so is fuzziness. To make fuzziness clear is the way to make us know more about categorization.

6.2 Categorization and Translation Studies

Each language encodes a system of culturally significant conceptual categories. Conceptual categories represent a community's shared knowledge of their natural and sociocultural environment necessary for functional and adaptive interaction. Since conceptual categories are culturally marked, translation involving cross-culture categories needs a lot of work on category-shift. The cultural differences in categories lie in non-equivalences, internal structural differences, hierarchical differences, prototypical differences, etc. For example, there is no equivalence in Chinese to the English *airing cupboard*; the word *uncle* in English manifests little equivalence to Chinese family categories such as *jiujiu* and *yima*; the category FESTIVAL has totally different internal structure in Chinese and English. In Chinese, FESTIVAL refers to Spring Festival, Tomb-Sweeping Day, Mid-Autumn Day, and National Day; whereas in English, FESTIVAL refers to Christmas, Thanksgiving, or Easter. Due to cultural differences in categories, the following methods are adopted to deal with the categorical differences: category substitution, conversion of category members, conversion of prototypical members, conversion of categorical hierarchy (Wen & Xiao 2019).

Category substitution refers to transferring between categories by which one category in the target language is used to replace a certain category in the source language. Literal translation involves direct category correspondence, and free translation involves category substitution. Consider the following examples (ST = source text, TT = target text):

(13) ST: I know criminals. *Chicken livered*, most of them.
TT: Wo liaojie zuifan. Tamen daduoshu dou danxiaorushu.

Here *chicken livered* is translated into *danxiaorushu*, in which the category CHICKEN is substituted by another animal category MOUSE that in Chinese means a coward.

When the category member A in the source text is substituted with category member B in the target text, conversion of category members is actually being employed. A typical issue is the COLOR category due to the reason that category members differ in different languages and cultures, and the same member may evoke different associations. Consider the following example:

(14) ST: He beat her black and blue.
TT: ta ba ta dade qing yi kuai, zi yi kuai.

A certain category may have different prototypes in different cultures. For example, the SPEAKING model in MOUTH category has "teeth" as the prototype in Chinese, while "tongue" in English. For example:

(15) ST: That little girl has a ready *tongue*.
TT: nage xiaoguniang zhenshi lingyalichi.

As we know, a category has three levels—superordinate level, basic level, and subordinate level. Superordinate level shares the least cultural differences, while basic level has some cultural

differences and subordinate has the most differences. In translation, subordinate terms may have the greatest gap in different cultures, and vice versa. So the conversion of "subordinate-basic-superordinate" is the most frequently used, although some exceptions exist if associative meanings of categories differ in different cultures.

(16) ST: The dinner cost us five dollars *a head*.
TT: zhe dun fan huaqu women meiren wu kuai qian.
(17) ST : The moment he rushed in, the hens *chucked* and the dogs *barked*.
TT: ta yi jinmen, ji ye jiao, gou ye jiao.

In example (16), *a head* is translated into its upper-level category, a person. In example (17), *chuck* and *bark* made by chickens and dogs are translated into a basic-level category, *jiao*, in Chinese.

6.3 Categorization and Language Learning and Teaching

Linguistics is closely related to categorization at two levels (Wen 2014). First of all, linguists employ categories to describe research objects, as do scholars in other fields. For instance, the sounds made by humans include verbal sounds and non-verbal sounds; phonetic units are classified into vowels or consonants, oral speech sounds or nasal sounds, plosive sounds or fricative sounds; words can be grammatically divided into nouns, verbs, and adjectives; sentences are divided into grammatical sentences and ungrammatical sentences. Secondly, the objects of linguistic research, such as phonemes, morphemes, words, phrases, sentences, and discourses, form categories themselves, and also represent categories. For example, preposition *in* represents an in-out relation between entities, while *on* represents contact between entities.

For linguistics, categorization has profound significance: one of the most important theoretical bases of cognitive linguistics is rethinking of categorization, which greatly contributed to the birth of cognitive linguistics. For linguists, language usage is based on categorization, and that is why category and categorization are the primary research objects in cognitive linguistics.

Taylor (2003) elaborates that people can employ language to categorize the physical world, and at the same time employ prototype theory to understand language.

> But polysemy is not a property of words. Other categories of language structure—morphological categories of number and case, mophosyntactic categories of tense and aspect, the syntactic categories of sentence types, even … prosodic categories like intonation contours—may also exhibit a cluster of related meanings, and must thus count as instances of polysemy.
>
> *Taylor 2003: 170*

The usage of words and language use are based on categorization. Categorization plays an important role in vocabulary teaching, especially in polysemy teaching. Senses of a polyseme comprise a network being linked by categorization relationship. Prototype theory holds that among all the meanings of polysemous words, there is a typical meaning, whereas the other meanings are derived from the typical one through cognitive means, such as metaphor, metonymy, association, which can form the radiation category of polysemous words. Therefore, in the teaching of polysemous words, it becomes the focus of teaching to pay attention to the relationship between different meanings, rather than to introduce different meanings in isolation. Different levels in categorization are also of great help to vocabulary teaching. Most of the vocabulary in basic level categories is words with one morpheme, which cannot be divided further. They have the characteristics of high frequency of use and strong ability of word formation. In language teaching, we should make full use of these characteristics of basic level category vocabulary, and use word formation, association, and

collocation methods to help learners build a semantic network of vocabulary. But Rosch (1978) thinks that it can create an interesting effect to replace basic level category words with subordinate level words in writing.

7. Concluding Remarks

In this chapter we have provided an overview of categorization by outlining various related theories, their hypotheses, advantages, and limitations. Levels of categorization reveal the internal structure of categories, and the interaction of different levels can also account for the dynamic nature of categorization. The dynamic nature lies in category itself and also drives the development of category to decategorization which is proved to be effective in elaborating multifunctionality. As one capability of the human mind, categorization can also be applied to many other aspects of linguistic research, such as metaphor, translation, and language learning and teaching.

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Related Topics

cognitive semantics; embodiment; construal; concepts and conceptualization; cognitive linguistics and language pedagogy; cognitive linguistics and second language acquisition

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11

STANDARD AND EXTENDED CONCEPTUAL METAPHOR THEORY

Zoltán Kövecses

1. A Brief History of Conceptual Metaphor Theory

We can distinguish several stages in the development of conceptual metaphor theory (CMT). As Lakoff and Johnson (1980; Lakoff 1993) acknowledge, the theory grew out of previous work on metaphor, perhaps most directly from that by Michael Reddy (1979). Lakoff and Johnson's book became a scientific bestseller inspiring researchers in a large number of disciplines around the world. The main idea of the book was that metaphor is not simply an ornamental device in the use of language, as it was commonly assumed previously by most scholars; instead, it is a tool of thought that has the power to actually define what is real for us. Lakoff and Johnson argued that the "metaphors we live by" can create a certain view, or understanding, of reality. For example, thinking of life as a journey can impose a particular understanding on what we take to be life—a journey with alternative paths, obstacles, goals, companions, and so on. In their work, Lakoff and Johnson emphasized that the conceptual system is to a large extent metaphorical in character and that it is based on our most basic bodily experiences (Lakoff & Johnson 1980; Johnson 1987; Lakoff 1987). Lakoff and Johnson defined conceptual metaphor in the following way: *A conceptual metaphor is understanding one domain of experience (that is typically abstract) in terms of another (that is typically concrete).*

The study of emotion language and that of the nature of emotion concepts provided fertile ground for demonstrating many of these ideas and developing them further (Kövecses 1986; Lakoff & Kövecses 1987; Kövecses 1988, 1990, 2000a). It also inspired cognitive psychologists and psycholinguists to begin work on experimentally testing the hypotheses formulated by cognitive linguists (for a survey, see Gibbs 1994). Gibbs was the first to provide evidence for the psychological reality of conceptual metaphors. At about the same time, work on conceptual metaphors was also extended to literature (Lakoff & Turner 1989; Turner 1991, 1996) and the historical study of the lexicon (Sweetser 1990).

In 1993, Lakoff published a major survey article on conceptual metaphor theory, "The contemporary theory of metaphor", in the collective volume *Metaphor and Thought*, edited by A. Ortony (1993). In the article, Lakoff summarized the main research findings following and motivated by *Metaphors We Live By*. He also contrasted CMT with other theories of metaphor as presented in the same volume, and pointed out that CMT fares better on many counts than other theories of metaphor.

The next major development in CMT came with the publication of Lakoff and Johnson's new book *Philosophy in the Flesh* (1999). The novelty of the book as regards CMT was threefold. First, Lakoff and Johnson argued that much of philosophy is based on metaphorical thought. Second, it adopted the theory of "primary metaphor" as the central notion in CMT (see below). Third, given the embodied nature of primary metaphors, Lakoff and Johnson proposed the philosophy of metaphor-based experientialism.

At the same time, several researchers suggested that no theory of conceptual metaphors can be adequate without taking into account the cultural dimension of metaphors. Partly based on the many cross-linguistic studies in the 1990s and early 2000s (e.g., Kövecses 1995; Geeraerts & Grondelaers 1995; Yu 1998, 2002), scholars began to propose theories of conceptual metaphors that stressed *both* the embodied nature and cultural embeddedness of metaphor (see, e.g., Gibbs 1994, 1999, 2006; Maalej & Yu 2011; Kövecses 2000a, 2005). Kövecses proposed that conceptual metaphors display a considerable degree of variation not only cross-culturally but also intraculturally (e.g., Kövecses 2005, 2010). Lakoff suggested from the mid-1990s onwards that conceptual metaphors can actually be responsible for creating social-political divisions within societies (e.g., Lakoff 1996). Lakoff and Nunez (2002) also showed that metaphor forms the basis of not only social and cultural issues but also mathematics.

In more recent publications, Lakoff and his colleagues (e.g., Gallese & Lakoff, 2005; Lakoff 2008; Feldman 2006) argued for a neuroscientific approach to metaphor, suggesting that the embodied character of metaphor naturally leads to certain metaphorical patterns in the functioning of the brain in the course of conceptualization. While most of the claims are based on computational models of the brain, there is also some actual neuroscientific research trying to see what happens in the brain in the course of metaphorical conceptualization (see, e.g., Coulson, 2008).

In the first decade of the century, the issue of methodology came to the forefront of metaphor research. Especially two questions were investigated: (1) How can we identify a metaphor in language use (Steen 2007)? (2) How does our knowledge about the use of conceptual metaphors change if we work with large corpora and with real instances of metaphor use (Cameron 2003; Musolff 2004, 2006; Deignan 2005; Semino 2008)? In these and other important publications, several metaphor scholars produced alternative or complementary methodologies in the study of metaphor.

Most recently, several researchers have turned their attention to the role of context in metaphorical conceptualization, and, as a result, they have provided new insights to our knowledge about metaphor—specifically about how the metaphorical mind engages in complex ways with the environment in which communication takes place (see, e.g., Gibbs & Cameron 2008) and how novel metaphors can often emerge from this interaction in a variety of communicative contexts (see, e.g., Kövecses 2015).

This completes our survey of the brief history of CMT. We can now turn to some of its important suggestions.

2. The "Standard" Theory of Conceptual Metaphors

In CMT, metaphorical linguistic expressions are seen as realizations of conceptual metaphors. Consider now the linguistic metaphors that Lakoff and Johnson (1980: 46) use to illustrate the THEORIES ARE BUILDING conceptual metaphor:

THEORIES (and ARGUMENTS) ARE BUILDINGS

Is that the *foundation* for your theory?
The theory needs more *support.*
The argument is *shaky.*

We need some more facts or the argument will *fall apart.*
We need to *construct* a *strong* argument for that.
I haven't figured out yet what the *form* of the argument will be.
Here are some more facts to *shore up* the theory.
We need to *buttress* the theory with *solid* arguments.
The theory will *stand or fall* on the *strength* of that argument.
The argument *collapsed*.
They *exploded* his latest theory.
We will show the theory to be *without foundation*.
So far we have *put together only the framework* of the theory.

In the *Collins Cobuild English Guides* by Deignan (1995), the following examples (i.e., linguistic metaphors) can be found for THEORIES ARE BUILDINGS (taken from Kövecses 2002/2010):

THEORIES ARE BUILDINGS

Increasingly, scientific knowledge *is constructed* by small numbers of specialized workers.
McCarthy *demolishes* the romantic myth of the Wild West.
She lay back for a few moments contemplating the *ruins* of her idealism and her innocence.
Don't be tempted to skip the first sections of your programme, because they are the *foundations on which* the second half *will be built*.
… the advance that *laid the foundations* for modern science.
Our view, he said, is that these claims are entirely *without foundation*.
My faith was *rocked to its foundations*.
The second half of the chapter *builds on* previous discussion of change and differentiation in home ownership.

The conceptual metaphor here is made up of two domains: BUILDINGS (the source domain) and THEORIES (the target domain). The conceptual metaphor can be given in the notation of CMT as THEORIES ARE BUILDINGS. It is this that underlies the metaphorical expressions listed above. The conceptual metaphor is constituted by a set of "mappings" between the two domains of experience that are brought together for purposes of understanding the "target domain" (THEORIES) through the "source domain" (BUILDINGS). The mappings are systematic conceptual correspondences between the source and the target. Thus, the metaphor examples above are based on the set of mappings below:

SOURCE		*TARGET*
builders	→	creators (of the theory)
construction/building	→	creation
foundation of the building	→	logical basis of the theory
framework	→	structure/outline
support	→	evidence
strength	→	plausibility
collapse of the building	→	loss of validity

The construction of the building corresponds to the creation of the theory (e.g., "scientific knowledge is constructed"), the foundation of the building to the logical basis (e.g., "show the theory to be without foundation"), the support of the framework to the evidence of the theory (e.g, "facts to shore up the theory"), etc.

Grady (1997a, 1997b) showed that conceptual metaphors like THEORIES ARE BUILDINGS are constituted by what he called "primary metaphors". Primary metaphors make up "compound metaphors". The primary metaphors that constitute THEORIES ARE BUILDINGS are LOGICAL ORGANIZATION IS PHYSICAL STRUCTURE and PERSISTENCE IS REMAINING ERECT. More generally, primary metaphors, such as conceptualizing logical organization as physical structure, persistence as remaining erect, as well as purposes as destinations, affection as warmth, and a host of others, are based on correlations in experience between an abstract concept (purpose) and a sensory-motor one (destination).

Given such examples as the above, Kövecses suggested that the THEORIES ARE BUILDINGS conceptual metaphor focuses on, or profiles, three aspects of the concept of THEORY (Kövecses 2002/2010): (1) the aspect of the construction of a theory (as exemplified by *build, construct, put together*); (2) abstract structure (as exemplified by *(without) foundation, groundwork, framework, build on, lay the foundations, collapse, demolish, shore up, buttress*); and (3) abstract stability or lastingness (as exemplified by *strong, solid, shaky, shore up, buttress, fall apart, in ruins, rock to its foundations, stand or fall*). I proposed that such "meaning foci" (that is, the habitually profiled aspects) of BUILDING as creation, abstract structure, and lastingness can be captured by means of mappings:

building → creation or construction of a complex abstract system
physical structure of the building → abstract structure of a complex abstract system
physical strength (of the structure to stand) → abstract stability/lastingness (of the complex abstract system)

Essentially, it is these meaning foci, with the exception of the first, that Grady's (1997a, 1997b) primary metaphors also capture: LOGICAL ORGANIZATION IS PHYSICAL STRUCTURE (corresponding to the second) and PERSISTENCE IS REMAINING ERECT (corresponding to the third).

The notion of primary metaphor provided a new, experimentally testable grounding for many conceptual metaphors. This view of metaphor opens the way to more tightly connecting metaphors to bodily (and potentially neural) experience and seeing metaphors as arising from embodiment. The grounding of metaphor in embodiment thus became a crucial aspect of CMT, as convincingly demonstrated by a large number of experimental studies (Gibbs 2006; Boroditsky 2001; Boroditsky & Ramscar 2002; Casasanto 2009). Since the human body and the brain are predominantly universal, the metaphorical structures that are based on them will also be predominantly universal. This explains why many conceptual metaphors, such as KNOWING IS SEEING, can be found in a large number of genetically unrelated languages. This does not mean, however, that *all* conceptual metaphors that are based on primary metaphors will be the same from language/culture to language/culture. It was recognized early on that the particular culture in which a metaphor develops is just as significant in shaping the form of the conceptual metaphors in different languages/cultures as the universal bodily experiences themselves (see, e.g., Taylor & MacLaury 1995; Taylor & Mbense 1998; Yu 1998, 2002; Kövecses 1995; Musolff 2004). Furthermore, several researchers pointed out that variation in metaphor can also be found within the same language/culture (for a survey of this research, see, e.g., Kövecses 2005).

In many conceptual metaphors the source and target domains are related to each other by means of resemblance, or similarity, rather than some bodily correlation. Thus, researchers in CMT commonly distinguish correlation-based conceptual metaphors and resemblance-based ones. Resemblance-based metaphors are typically the focus of non-CMT types of metaphor research and are commonly referred to as metaphorical analogies. Analogies are usually seen as multiple mappings between two frames or domains. Consider the expression *gut the building*, as used in the following example:

> Kirk E. Kreuzwieser, vice president of Strollo Architects, says much of the interior of the 96-year-old Wells Building needs to be gutted. He and Gregg Strollo, company president, believe the $4 million-plus rehabilitation project could be completed in less than nine months after financial issues are resolved.
>
> *(www.vindy.com/photos/2013/jun/17/68965/)*

This is a domain- or frame-level metaphorical analogy that is constituted by multiple mappings. The mappings are:

the person who disembowels a dead animal → the person who removes the interior of a building
the animal body → the building
the bowels → the interior of the building
the action of disemboweling → the action of removing the interior of the building

The mappings are based on a structural analogy between two frames or domains, which means that the propositionally-explicated mappings between the two frames or domains (here, animal and building) share an image-schematic structure, an image schema, something like that in Figure 11.1. Thus, structural analogy (or resemblance) means that the source and the target share some image schema (here, internal container (or object) moved out of external container).

If we employ a broader definition of conceptual metaphors as any case of multiple mappings from a source to a target (and not just those that are correlation-based), many metaphors that are resemblance-based (those that map entire structures, and not just a single feature) would also qualify as conceptual metaphors (such as the metaphor above or, say, the AN ATOM IS THE SOLAR SYSTEM metaphor).

Many conceptual metaphors (both the similarity-based ones and the primary metaphors) are based on "image schemas". These are abstract, preconceptual structures that emerge from our recurrent experiences of the world (Johnson 1987; Lakoff 1987). Such skeletal preconceptual structures include CONTAINER, SOURCE-PATH-GOAL, FORCE, VERTICALITY, and several others. For example, the STATES ARE CONTAINERS primary metaphor derives from the CONTAINER image schema, the LIFE IS A JOURNEY metaphor from the SOURCE-PATH-GOAL schema, the EMOTIONS ARE FORCES metaphor from the FORCE schema, and so on.

In other cases of metaphorical mapping, it is not the elements constituting a source domain that get mapped from source to target, but the knowledge we have about them. Let us take the following example:

> Don't let Joseph come on the Vegas trip, he's only going to be a wet blanket and take the fun out of everything.
>
> *www.urbandictionary.com/define.php?term=wet%20blanket)*

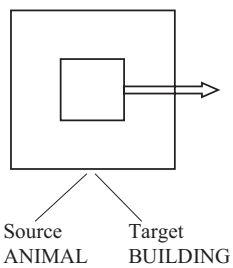


Figure 11.1 Shared image schema

A wet blanket is a person who ruins other people's fun. The linguistic metaphor *wet blanket* is based on the conceptual metaphor ENTHUSIASM IS FIRE (e.g., He *lost his fire* for the job). Given what we know about fires, we can transfer to the target the information that if we put a wet blanket over a moderate fire, it will extinguish it. In the same way, people's enthusiasm can also be ruined by some inappropriate behavior. This kind of knowledge transfer from source to target is called "metaphorical inference". Such metaphorical inferences are frequently used in, for example, advertising.

It is an important assumption of CMT that since metaphor is part of the conceptual system, conceptual metaphors can be expressed not only linguistically but also in any mode of expression, including images, gestures, music, bodily performance, and several others (see, e.g., work by Lakoff 1993; Forceville 2008, 2016; Cienki & Müller 2008; El Refaie 2019). As just one example, let us take cartoons where a person's anger is often depicted as steam coming out his/her ears. This image builds on the conceptual metaphor ANGER IS A HOT FLUID IN A CONTAINER. The theory of conceptual metaphors is thus inherently "multimodal".

This completes our survey of the most basic characteristics of "standard" CMT, and we can turn to some issues that require further attention within the theory.

3. Extending CMT

Even the sketchy survey above gives rise to certain additional issues that need to be addressed within CMT. These include at least the following:

a If metaphor is inherent in the conceptual system and, as Langacker (1987) puts it, grammar is a form of conceptualization, then metaphor and grammar must interact in some ways. What would this interaction look like in a cognitive linguistic framework?

b What is the appropriate conceptual level at which we can, or should, identify conceptual metaphors? Indeed, what are the conceptual structures that make up conceptual metaphors? Are they domains, frames, scenes, schemas, spaces, or something else? Most of these have been mentioned in the CMT literature and some of them in the preceding discussion, but there is no consensus as regards this issue.

c Though it is true that theories of metaphor *comprehension* make extensive use of the notion of context, theories of metaphor *production* within CMT have almost completely ignored this notion. Is it possible to propose a theory of conceptual metaphors within the cognitive linguistic paradigm that would integrate the context of metaphor production into CMT?

Undoubtedly, there are many more questions that could be raised concerning CMT. However, I find the questions above, among possibly others, inevitable to raise in order to produce an extended, more comprehensive, and hopefully improved, version of CMT. In the remainder of the chapter, I focus on three relatively new developments within CMT: the relationship between metaphor and grammar, the multilevel view of metaphor, and the importance of the notion of context in explaining metaphor use.

Metaphor and Grammar

The main aim of CMT is to analyze and describe the conceptual nature of metaphor: how conceptual metaphors structure thought, how they enable inferences, how they can give us new perspectives on reality, how they can construct new ideas and concepts, how they are grounded in experience, and so on. However, metaphor scholars have increasingly realized in recent years that there is a close connection between language structure (i.e., grammar) and metaphorical conceptual structure. We are beginning to see that metaphor and grammar (Langacker 1987; Goldberg 1995; Taylor 2002) can cross-fertilize each other.

Let us just look at a single problem that can demonstrate this. Sullivan (2016) poses the question: Why is it that, given the sentences "The lawyer devised an argument", "The lawyer devised a *house*", "The *carpenter* devised an argument", and "The lawyer *constructed/built* an argument", only the last one (with the verb *construct* or *build*) is metaphorical? The first sentence describes literally what lawyers do. The other three, however, should all be instances of the THEORIES ARE BUILDINGS metaphor, since they contain words that have to do with the source domain of BUILDINGS: *house*, *carpenter*, and *construct/build*. After all, just like the building of the house corresponds to the creation of the argument and is thus metaphorical, the house should correspond to the argument and the carpenter should correspond to the person making the argument, but they don't and thus they are not metaphorical. The answer to the question is that, given the transitive construction with an agent, verb, and patient, only the verb (*construct* or *build*) is metaphorical in the sentences because it is a dependent element of the construction, while the other two (the two nouns) are autonomous within a cognitive grammar framework. As Sullivan (2016: 145) notes, "Elements are dependent when their meanings are incomplete without one or more autonomous elements." More generally, dependent elements in a construction evoke source domains (thus, are metaphors) and the autonomous elements in constructions evoke target domains (thus, are literal).

The study of the interaction between metaphor and (cognitive) grammar is a promising new avenue in CMT. For example, results such as the above make sense of corpus findings according to which "verbs are more frequently used metaphorically (that is, to evoke metaphoric source domains) than nouns" (Sullivan 2016: 143), as observed, for instance, by Cameron (2003) and Deignan (2005) in their corpus-based studies.

The Multilevel View of CMT

Let us now return to the concept of BUILDING and show why another extension of standard CMT, the multilevel view of conceptual metaphors, is necessary. The original Lakoff-Johnson view saw metaphor on the domain level. Later discussion of metaphor often used frames as the conceptual structures involved in metaphor. In blending theory, Fauconnier and Turner (2002) predominantly talk about mental spaces in relation to metaphorical blends. Lakoff (1993), David, Lakoff, and Stickles (2016), and Dancygier and Sweetser (2014) take into account two or three hierarchically interrelated layers of conceptual metaphors according to the various levels of the schematicity of metaphors. Kövecses (2017) proposes a four-level view, where a conceptual metaphor is constituted by a schematicity hierarchy composed by an image schema, domain, frame, and mental space level. As an example let us take the THEORIES ARE BUILDINGS metaphor again.

BUILDING is a concept that is based on, or characterized by, several image schemas, such as CONTAINER, VERTICALITY, PART-WHOLE, and OBJECT.

The BUILDING domain (or domain matrix) is constituted by a large number of schematic concepts. Specifically, the building is a PHYSICAL OBJECT in SPACE; as a physical object it has SIZE; it has a LOCATION; it has both vertical and horizontal EXTENSION; it is a STRUCTURED OBJECT; it is a MAN-MADE structured object; it is made of PHYSICAL MATTER; it is an ENCLOSED SPACE that is partitioned into PARTS; it has a particular SHAPE and COLOR; it has some FUNCTION; and so on.

In addition, the BUILDING domain consists of a number of frames. Most obviously, it possesses a BUILDING (as a process) frame; a building is something that needs to be built. It also possesses a (PHYSICAL) SUPPORT frame, in which there are certain elements organized in a structured way. Furthermore, it has a frame for the PARTS OF THE BUILDING, such as walls, rooms, doors, windows, chimneys, basement, cellar, attic, roof, floors, stairs, and many others. Moreover, the domain of BUILDING consists of a FUNCTION OF BUILDING frame that provides information about who uses the building, in what ways, and for what purpose(s). There are no doubt several other frames that make up the domain of BUILDING, but for the present illustrative purposes these four will do: BUILDING, (PHYSICAL) SUPPORT, PARTS OF BUILDING, and FUNCTION OF BUILDING.

At the mental spaces level (i.e., in actual instances of real-world communication), we would have further specifications of any of the frames discussed above. For example, an elaboration of the BUILDING frame would be the mental space associated with a sentence like: "John built himself a strong house." The sentence would specify the specific individual who built the house and a structural property of the house. These are pieces of information that are not contained in the more schematic BUILDING frame.

The concepts constituting the conceptual metaphors on the various levels range from most schematic to least schematic. Thus we get the following conceptual metaphors:

Image schema level:

ABSTRACT COMPLEX SYSTEMS ARE OBJECTS
ABSTRACT COMPLEX SYSTEMS ARE VERTICAL OBJECTS
ABSTRACT COMPLEX SYSTEMS ARE CONTAINER OBJECTS
ABSTRACT COMPLEX SYSTEMS ARE WHOLE OBJECTS WITH PARTS

Domain level:

A(N ABSTRACT COMPLEX) SYSTEM IS A PHYSICAL OBJECT (BUILDING)
THE CREATION OF THE SYSTEM IS THE PHYSICAL CREATION OF THE BUILDING
THE STRUCTURE OF THE SYSTEM IS THE PHYSICAL STRUCTURE OF THE BUILDING
THE PARTS OF THE SYSTEM ARE PARTS OF THE PHYSICAL OBJECT (BUILDING)

Frame level:

THE CONSTRUCTION OF THE SYSTEM IS BUILDING (as process)
LOGICAL SUPPORT IS PHYSICAL SUPPORT
submetaphor:
THE STABILITY OF THE BUILDING IS THE STRENGTH OF PHYSICAL SUPPORT

Mental space level:

(in the form of particular examples)
MARY BUILDING A CAREER IS MARY BUILDING A HOUSE
JOHN'S LIFE WITHOUT A FOUNDATION IS JOHN'S HOUSE WITHOUT A FOUNDATION

These mappings at the different levels license the use of metaphorical expressions at different levels of schematicity. For example, the word *inside*, as in "inside the system", relates to the image-schematic level (the CONTAINER image schema), while the word *structure* (when used metaphorically) is based on a mapping at the domain level. Similarly, the word *builder* in the phrase "the chief *builder* of the organization" is related to the BUILDING (as process) frame. In other words, metaphorically used words, just like their corresponding conceptual metaphors, can be found at various levels of schematicity.

Very importantly, such metaphorical schematicity hierarchies are embedded in the relevant context of metaphorical communication (see Kövecses 2017, 2020). It is the notion of context that we discuss next.

Metaphor and Context

Conceptual metaphor theory has been primarily formulated as a cognitive theory—lacking a contextual component. In *Where Metaphors Come From*, using examples from naturally occurring

discourse, Kövecses presented a large amount of evidence to show that the use of metaphors in discourse is influenced by a variety of contextual factors. These contextual factors can be grouped into four large categories: situational context, discourse context, conceptual-cognitive context, and bodily context.

Situational Context

The situational context comprises a variety of different contextual factors. Most commonly, this type of context can be thought of as including the physical environment, the social situation, and the cultural situation.

The *physical environment* includes the flora, the fauna, the landscape, the temperature, the weather, perceptual properties of the situation, and so on. For example, it is a common observation that American English metaphors relating to the physical environment are characteristically different from those of other English-speaking countries (see, e.g., Kövecses 2000b). The *social situation* consists of social aspects of life that typically center around notions such as gender, class, politeness, work, education, social organizations, social structure, and others. All of these can play a role in metaphorical conceptualization. The *cultural situation* involves both the global context (the shared knowledge represented in the conceptual system) and the local context (the specific knowledge in a given communicative situation). For example, we have ANGER IS HEAT (OF FLUID OR SOLID) in a large number of languages such as English and Hungarian, whereas in Chinese the metaphor can also involve GAS as its source domain—as a result of the influence of Yin and Yang theory (see Yu, 1998).

Discourse Context

The discourse context involves the surrounding discourse, knowledge about the main elements of discourse, the previous discourses on the same topic, and the dominant forms of discourse related to a particular subject matter.

The *surrounding discourse* is simply the linguistic context—often referred to as "cotext". Viewed from the perspective of the discourse's producer (the speaker), elements of the preceding discourse (either by the speaker/conceptualizer 1 or the hearer/conceptualizer 2) can influence the (unconscious) choice of metaphors. Conceptualizers often rely on their *knowledge concerning the main elements of a discourse*: the speaker, hearer, and the topic. An example of this involved David Beckham in an article in which the journalist remarked: "*Los Angeles Galaxy are sardines not sharks in the ocean of footy*" (Kövecses 2010). Here the relevant contextual knowledge includes that Beckham played for the Los Angeles Galaxy soccer team and that Los Angeles is located on the ocean with all kinds of fish in it. The metaphors in one discourse can also derive from *previous discourses on the same topic*. This can take a variety of forms ranging from elaborating, extending, questioning, negating, reflecting on, ridiculing, to otherwise taking advantage of a metaphor previously introduced. Certain forms of discourse can acquire *dominant status* in a community. When a dominant form of discourse related to a subject matter emerges, the metaphor used in or based on this discourse can become widespread both temporally (historically) and spatially (cross-culturally). For example, the discourse of Christianity commonly gives rise to the use of metaphors in the Christian world.

Conceptual-Cognitive Context

This type of context includes the metaphorical conceptual system at large, ideology, knowledge about past events, and the characteristic interests and concerns of a community or individual.

Concepts can stand in a metaphorical relationship with one another (e.g., LIFE IS A JOURNEY, ARGUMENT IS WAR) in long-term memory. Given such metaphorical relationships between concepts (such as between, say, ARGUMENT and WAR), their presence or absence in the *metaphorical conceptual system* may lead to the production and comprehension of particular metaphors. *Ideology* can also be a formative factor in how metaphors are used in discourse. One's ideological stance concerning major social and political issues may govern the choice of metaphors (as work by, for instance, Goatly 2007 and Lakoff 1996 shows). *Being aware of past events and states* (i.e., items in short-term and long-term memory) shared by the conceptualizers may also lead to the emergence of specific metaphors in discourse. For instance, it has been often observed that the memory of historical events can lead to the production (and comprehension) of some metaphors (see, e.g., Deignan 2003; Kövecses 2005). People are commonly prompted to use particular metaphors (more precisely, metaphorical source domains) relative to their *interests and concerns* about the world (see Kövecses 2005). If a person has some kind of professional interest, that person is likely to draw metaphors from his or her sphere of interest (for specific examples, see Kövecses 2005). In other words, the kinds of activities we engage in routinely affect the metaphors (the source domains) we use (see also Gelfand & McCusker 2001).

Bodily Context

A particular state of the body can produce particular metaphorical conceptualizations in specific cases, such as a poet's or writer's illness. Such cases illustrate, more broadly, that people's bodily specificities influence which metaphors they tend to use. There is experimental evidence (Casasanto 2009) that left-handers prefer to use the MORAL IS LEFT, as opposed to the MORAL IS RIGHT, conceptual metaphor. Such metaphors contrast with the metaphors that evolve on the basis of universal properties of the human body (i.e., the correlation-based primary metaphors). In other words, the body can lead to the production of metaphors in discourse in the same way as the other contextual factors previously mentioned can. Given this, we can think of the body as an additional context type.

Local and Global Context

Given the varied set of contextual factors that were briefly introduced above, two general types of context can be distinguished: local and global (see Figure 11.2). The *local context* involves the specific knowledge conceptualizers have about some aspect of the immediate communicative situation. Thus, the local context implies specific knowledge that attaches to the conceptualizers in a specific communicative situation. By contrast, the *global context* consists of the conceptualizers' general knowledge concerning their community's environment (physical, social, cultural). It involves knowledge shared by an entire community of conceptualizers. Figure 11.2 summarizes the various context types and contextual factors.

It follows from the above discussion that context is an unavoidable aspect of metaphorical meaning making. The conceptual and the contextual aspects of metaphor are inextricably bound together; one cannot exist without the other. Conceptual metaphor theory cannot simply be just conceptual; it also needs to be contextual.

4. Some Implications of CMT

A major strength of CMT, and a source of its attractiveness, is that it offers new insight to a huge variety of topics and subject matters in the humanities and the social as well as the natural sciences. The insights all have to do with the fact that human beings are conceptualizing beings and that conceptualization, as suggested by CMT, is to a large degree metaphorical in nature. For this reason, CMT has implications for any field where human conceptualization is an issue, be it translation,

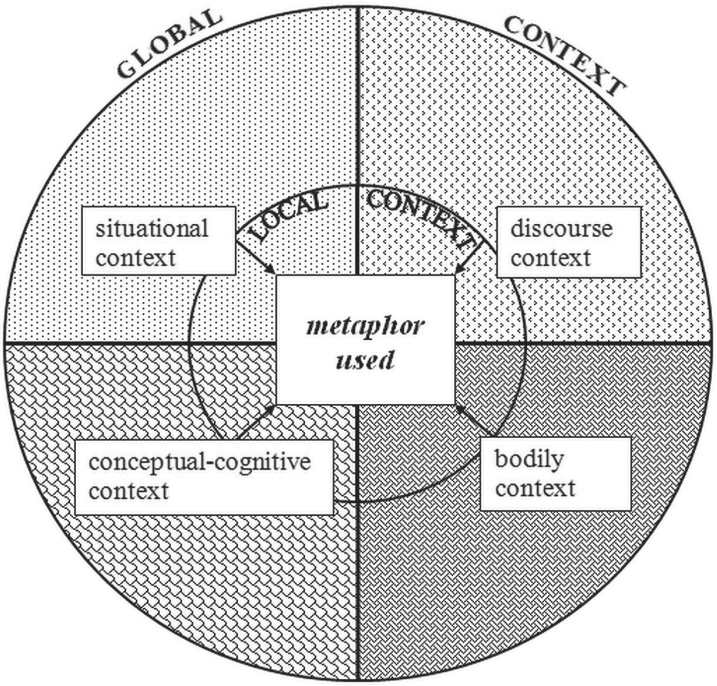


Figure 11.2 Summary of context types and contextual factors
Source: From Kövecses 2015.

literary interpretation, language teaching, the "social construction of reality" or "ways of world-making", politics, social issues, health communication, any form of social decision-making, personal and social planning, the conceptualization of any domain of scientific activity (including language), the reconstruction of history, the study of religion, the philosophy of science, and so on, all the way to mathematical thinking. And, of course, the area of human conceptualization itself also falls within the scope of CMT, where we can study the various ways in which human conceptualization is understood by means of different conceptual metaphors. This random selection of the fields where metaphor study within the framework of CMT can yield important insight is an indication that everyone working on CMT in the broader sense is participating in a project whose ultimate general goal is to find out how we as human beings function in complex ways often regulated by conceptual metaphors.

Further Reading

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Related Topics

embodiment; image schemas; multimodality; cognitive pragmatics; culture in language and cognition

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12

CONCEPTUAL METONYMY THEORY REVISITED

Some Definitional and Taxonomic Issues[1]

Francisco José Ruiz de Mendoza Ibáñez

1. Introduction

Understanding the treatment of conceptual metonymy in Cognitive Linguistics requires contextualizing this phenomenon in connection with the initial groundbreaking proposals made by Lakoff and Johnson (1980) in the study of metaphor, which resulted in what was termed *Conceptual Metaphor Theory*. One of the main assumptions in this theory was that metaphor is an ordinary phenomenon in language and thought. Lakoff and Johnson did not consider metonymy to be any different in this respect. However, since Lakoff and Johnson's work was focused on metaphor, metonymy was only described in contrast to metaphor rather than in its own right. As a consequence, metonymy, like metaphor, was defined as a conceptual mapping, i.e., a source-target connection between two conceptual domains, but it was argued to differ from metaphor in three ways:

(i) In metonymy the mapping takes place inside a single conceptual domain, but in metaphor it takes place across different domains.
(ii) In metonymy the source stands for the target, but in metaphor the source is used to reason about the target.
(iii) Metonymy is primarily referential while metaphor is predicative.

The focus on metaphor led to a proliferation of studies on this phenomenon in the 1980s and 1990s, with only occasional reference to metonymy. Metonymy was thus felt to be worth studying in terms of its interaction with metaphor (e.g., Goossens 1990), or of its boundaries with metaphor (e.g., Dirven 1993) and literal uses of language (e.g., Croft 1993). In the late 1990s, however, some scholars began to draw attention to the productiveness of metonymy in terms of its frequency of occurrence and its ubiquitous manifestation across domains of linguistic description. Two landmark studies in this respect are Kövecses and Radden (1998) and Panther and Thornburg (1998). The first, by categorizing metonymy in terms of form-meaning-referent connections, and in terms of the types of cognitive models involved, provided the first published attempt to systematize metonymy types. Kövecses and Radden (1998) identified the existence of metonymic activity beyond the traditional lexical level, as exemplified by the following cases of metonymic motivation for word class changes: ACTION FOR OBJECT (*Give me one bite*); INSTRUMENT FOR ACTION (*to shampoo*

one's hair), TIME PERIOD OF ACTION FOR ACTION (*to summer in Paris*). The second study, in conjunction with Thornburg and Panther (1997), was the first attempt to deal with illocution from the point of view of metonymic thinking. These authors argued that the traditional Searlean satisfaction conditions for speech acts (cf. Searle 1969) are but components of conventional illocutionary scenarios that can be exploited metonymically. In their proposal, a question like *Would you like to answer the phone?*, which materializes the willingness condition of the request speech act (i.e., the hearer's desire to perform the action), is but a metonymic point of access to the request scenario where the hearer is asked to answer the phone.

Other studies followed in the wake of these initial attempts to determine the true nature and scope of metonymy (often still in contrast with metaphor). Some of them are the collections of papers in Panther and Radden (1999a), Barcelona (2000a), Dirven and Pörings (2002), Benczes et al. (2011), and monographs like Ruiz de Mendoza and Otal (2002), Bierwiaczonek (2013), Littlemore (2015), and Brdar (2017). From the large number of topics that relate to metonymy, the present chapter will focus on definitional and taxonomic issues, i.e., the nature and scope of metonymy. The former are addressed in section 2, and the latter in section 3, whereas section 4 discusses some future prospects arising from the previous discussion. The aim is not only to provide a critical overview of selected insights, but also to propose solutions for problems in the existing approaches and offer the reader possible lines of development of what has already been termed Conceptual Metonymy Theory (Dirven & Ruiz de Mendoza 2010: 39).

2. What Is Metonymy?

This section will be devoted to the old but still unsolved topic of the nature and scope of metonymy. There are two main traditional positions, (i) and (ii) below, and two more recent ones, (iii) and (iv), which are but partial developments of the first two.

(i) *Metonymy as a mapping*. In this view, metonymy is a domain-internal conceptual mapping bearing a "stands for" relationship between its source and target meaning (Lakoff & Johnson 1980).
(ii) *Metonymy as a point of access*. This position regards metonymy as a "reference point" phenomenon whose source meaning affords access to a related target meaning within the same experiential domain (cf. Langacker 1993; Kövecses & Radden 1998).
(iii) *Metonymy as conceptual elaboration*. Here, metonymy is seen as a form of conceptual elaboration, or domain expansion, based on abductive reasoning, whose target meaning adds new conceptual material to the source meaning (Panther 2005; Panther & Thornburg 2018).
(iv) *Metonymy as a combination of cognitive operations*. Metonymy is treated as a combination of one of two more basic inference-producing cognitive operations, domain *expansion* or *reduction*, with a formal substitution operation (Ruiz de Mendoza 2000, 2011, 2017; Ruiz de Mendoza and Pérez 2003).

I will argue that claim (iv) provides a meeting point for the main assumptions of the other claims while correcting some misconceptions.

2.1 Metonymy as a Mapping

This position arises from the seminal proposals in Lakoff and Johnson (1980). Metonymy is defined as a mapping involving a "stands for" relationship between related parts of a conceptual domain, between the whole domain and one of its parts, or between part of a domain and the whole of it. In this approach metaphor is understood as a mapping or set of correspondences across different conceptual domains. Metaphor is thus based on an "is a" relationship where one domain allows us to

think and reason about another domain (this was later assumed to be paralleled in the organization of people's neural circuitry; cf. Lakoff 2009). For example, CAUSES ARE FORCES maps physical impact onto non-physical impact: *Her beauty pulled me towards her*, *She won't bend my will*, *What he said drew me away from my old life*. The causer of change is a physical force, the object of change is the object of a physical force, reluctance to change is resistance, overcoming the reluctance is overcoming resistance, the capacity to induce change is someone's physical capacity or the intrinsic power of a natural phenomenon, and so on. On the other hand, metonymy is not used for reasoning but for making reference to objects or events from the perspective provided by its source domain. In *The buses have decided not to follow their usual route*, the subject noun phrase (*the buses*) stands for the bus drivers. Linguistic mention of the vehicles instead of the target meaning has communicative effects. It leads us to think of the bus drivers' decision from the point of view of the passenger-vehicle interaction within the taking-a-bus knowledge frame, where a passenger uses the bus service to reach a destination somewhere along the regular route of the bus.

The metonymy-as-a-mapping position, as formulated by Lakoff and Johnson (1980), has a weakness that can be solved by examining in some more detail the connections between metaphor and metonymy. This weakness relates to the observation that metonymy is mainly referential, whereas metaphor is predicative. Evidently, in their programmatic discussion, Lakoff and Johnson (1980) had in mind lexical metonymy, which is predominantly referential. They did not think of word class changes (categorial conversion) or illocutionary metonymy, which are much later proposals that have been illustrated above. However, even within the boundaries of lexical metonymy, these authors did not try to motivate the reason for its strong referential potential, which metaphor does not seem to have. Let us look into this issue in some more detail. We start off with lexical metaphor.

As noted by Ruiz de Mendoza and Otal (2002), it is possible to make metaphorical use of entity-denoting noun phrases like *the pig, the chicken, the rat, my rose, my little duckling*. Possible paraphrases for these noun phrases are provided between brackets: *Here's the pig* ('someone abusive'), *There goes the chicken* ('the coward'), *That's the rat that revealed our plan* ('the traitor'), *There's my tender rose that I love* ('the beautiful and frail woman'), *Here's my little duckling after a bath* ('the baby that the speaker finds as endearing as a duckling'). But this is a rather restricted use of metaphor confined to a limited number of constructions like the ones used in the examples. Lexical metaphors tend to use the "is a" predicative form (e.g., *He's a pig/a chicken/a rat*; *She's a tender rose*; *She's a nice little duckling*) or to work directly on verbal predicates eventually transcending the lexical level to create metaphorical predications (e.g., *The ship plowed the waves* 'broke the waves as a plow breaks the ground'). The referential use of a metaphor is based on the encapsulation of meaning implications in the source domain, which is expressed linguistically with the effect of converting the metaphorical noun phrase into the functional equivalent of a detailed definite description, which enhances its referential quality. Thus, *the rat* is the person that we find as "nasty" and "treacherous" as rats (note that we think of rats as dirty animals that can transmit serious disease by biting people unexpectedly). This encapsulation of meaning implications is also possible in the case of correlation metaphors, but in a somewhat different way. Correlation metaphors are not based on cross-domain similarities but on the co-occurrence of experiences (Lakoff & Johnson 1980, 1999; Grady 1999). For example, we can say that prices go up/down as a realization of the metaphor MORE IS UP/LESS IS DOWN, which is grounded in our common observation of seeing levels rise or fall as the amount of a substance increases or decreases. We can make referential use of these notions: *There's the rise you expected; That's the drastic drop/fall in prices we all feared*. The nouns *rise*, *fall*, and *drop* encapsulate the whole event thus allowing for a referential use of the metaphor. Take now AFFECTION IS WARMTH/LACK OF AFFECTION IS COLDNESS. This metaphor is based on the experience of feeling people's bodily warmth when being held affectionately or the lack of warmth when being distant.

We can thus say that a person is warm or cold. If a person is highly unaffectionate, he or she can be described as a *block of ice*. What this description does is build AFFECTION IS WARMTH into PEOPLE ARE OBJECTS (see Ruiz de Mendoza 2017; Miró 2018, for similar amalgams). In principle, this should make it possible to use AFFECTION IS WARMTH referentially. However, there is a strong need for well-defined contextual support to license such uses. Imagine a sulky wife who has stopped talking to her husband to show her resentment for his behavior. Tired of this situation, the husband remarks: *Here comes my loving block of ice!* This analysis leads to the conclusion that a correlation metaphor is sensitive to a referential use when the following two conditions hold:

(i) The situation or event that the source domain designates can be captured nominally (which, as noted above, may involve a grammatical metonymy licensing a change of word class).
(ii) There is a strong communicative pressure to displace the default focus of the metaphorical expression from the situation or event that it designates to the entities involved in it.

Lexical metonymy offers a different picture, since domain-internal relations are grounded in conceptual contiguity, whereas discontiguity is the rule in the case of metaphor. It would be odd to reason about one item in terms of another item with which it holds a relationship of contiguity. For example, we do not reason about a container in terms of its contents since the latter are located in the former. But we can reason about a person's head in terms of the structure and logic of containers. The metaphor in the sentence *Who put that idea into your head?* treats the hearer's head as a container in which people can put ideas as if they were objects. The container-contents connection itself, however, can be exploited internally on the grounds of the conceptual contiguity that holds between its two elements. This exploitation is merely one of substitution of one element for the other. The container substitutes for the content in *He spilled the bucket on his boots*, whereas the content stands for the container in *He ordered two beers* (e.g., 'two mugs of beer'). Substitution of one concept for another with which it holds a contiguity relationship is what underlies the feeling that metonymy is based on a "stands for" relationship. This type of relationship also holds for non-referential metonymies whether at the lexical or non-lexical level. For example, the lexical item *brain* substitutes (and thus stands) for 'intelligence' in *He has a quick brain*. Beyond the lexical level, in the domain of illocution, *I'm really hungry* can be a mere statement but, more generally, it stands for a request for food, i.e., the expression of a need stands for a directive scenario where the hearer is required to take action to satisfy the speaker's need.

A referential metaphor also works on the basis of substitution. Thus, the noun phrase *the rat* substitutes or stands for 'the person that behaves treacherously towards others'. The situation with non-referential metaphors is different. We can have substitution if there is class inclusion. For example, in *John is a rat*, the noun *a rat* includes John among the class of treacherous people. But substitution is not possible when the role of the metaphor is to reason about target properties without class inclusion, as in *His wife's eyes were an ocean of tears* or *Her teeth are shiny pearls.* The former example is focused on the abundance of tears shed by a person and the latter on the brightness of someone's teeth. The expressions *ocean of tears* and *shiny pearls* do not stand for these meaning effects. Rather they denote entities and their properties that allow us to understand corresponding properties in the target items. The reason why class inclusion licenses substitution is that in an *X is Y* formulation, if Y designates a class of source items (e.g., rats) characterized by any number of properties metaphorically ascribable to X, as a target entity, then X is to be interpreted not only as characterized by such properties but also as a member of the class of items that has those properties in the target. In other words, in this kind of metaphorical frame, it is not only Y's properties but also Y's relation to the class to which it belongs that is mapped onto X.

2.2 Metonymy as a Point of Access

This position is not essentially different from the previous one. The difference is a matter of emphasis on the fact that the metonymic source, besides standing for the target, affords access to it. The rationale for this view is Langacker's (1993) well-known discussion of metonymy as a reference point phenomenon in which the item first invoked allows us to make mental contact with another item with which it is related in a specifiable manner (see also Langacker 2009). Thus, in *spill the bucket*, the notion of 'bucket' affords mental access to the contents of the bucket (typically water).

Scholars like Kövecses and Radden (1998), Barcelona (2000a, 2000b), and Langacker (1993, 2009) entertain the idea that the "afford access" view can apply to all kinds of metonymy, including predicative and illocutionary metonymy. But there are other reference point phenomena (cf. Langacker 1993, 2009: 45–49). One is the grammatical marking of the possessor-possessed relationship where conceiving the possessor enables mental access to the possessed object. For example, in the phrase *Homer's Odyssey*, our attention shifts from the poet to the epic poem thus relegating the poet to the background. Metonymy involves a similar shift in focus. In *I am reading Homer*, Homer is a reference point for his work, which then receives focal attention, whereas the poet is backgrounded as a result. Evidently, a benefit of this treatment of metonymy is integrating this phenomenon with others with which it shares properties. However, the "afford access" view has been argued to have strong limitations. One, which has been pointed out by Panther (2005) and Panther and Thornburg (2018), is that this view cannot tell the difference between metonymy and other phenomena with which it holds crucial differences. A case in point is entailment. Panther and Thornburg (2018) argue that metonymy sets up a contingent (conceptually non-necessary) source-target relationship, whereas entailment involves a non-contingent relationship between two terms. For example, in *The piano is in a bad mood*, which instantiates INSTRUMENT FOR PLAYER, the existence of the instrument affords access to, but does not necessarily entail, the existence of the player. However, in *The loss of my wallet put me in a bad mood*, the loss of the wallet both affords access to and entails the non-possession of the object by the person that has lost it. However, this argument only clearly holds for some metonymic relations like INSTRUMENT FOR PLAYER. It does not hold for other relations like CONTENT FOR CONTAINER (*He ordered two beers*) or AUTHOR FOR WORK (*I am reading Homer*). There cannot be contents without a container and it is not possible to argue that someone is an author if he or she has never composed any work. It appears that a more complete account of this issue would be one which allows for the possibility of a non-contingent relationship to be metonymic provided that the affected term is cued by the text or the context into becoming engaged in a domain-internal shift. Compare *I am reading Homer* with *Homer was a poet*. The predicate *reading* cues for a metonymic interpretation of *Homer* that sorts out the apparent inconsistency holding between the two items. There is no such predicate-argument inconsistency in *Homer was a poet*, so there is no need for a metonymic reading. Therefore, if this line of reasoning is correct, metonymy is to be differentiated from entailment on other grounds than the contingency criterion. A plausible solution comes from tracing the source of domain-internal shifts. In the case of metonymy, it is to be found in textual or contextual clues, as mentioned above. In the case of entailment, there is no such textual or contextual requirement to work out the relationship. Thus, to interpret *I am reading Homer*, the shift from Homer to his work is a requirement induced by the clash between the verbal predicate and its complement. In *The loss of my wallet caused me a lot of trouble*, the predicate *caused me a lot of trouble* plays no role in deriving the non-possession entailment. This entailment is only conceptually consistent with the predicate (generally, people do not like to lose their possessions), but it is not an interpretive requirement. The same entailment would hold for *The loss of my wallet happened the same day my team won the League so I forgot to report to the police*, where it would play no special interpretive role. In any event, since metonymy is not alone in being a reference point phenomenon, the "afford access" view of

this figure of speech is not to be taken as definitionally central but rather as a complementary perspective to be added to the criteria discussed in 2.1.

2.3 Metonymy as Conceptual Elaboration

This view of metonymy was initially suggested by Panther (2005). It has been recently advocated more clearly by Panther and Thornburg (2018), who place it in opposition to the substitution view, defended by Carston (2002) within Relevance Theory. Basically, the claim made by Panther and Thornburg (2018) is that metonymy is a conceptual operation consisting in blending new conceptual material with the conceptual meaning arising from the linguistic expression. This means that metonymies are source-in-target operations whose target meanings are more complex than their source meanings, which essentially makes metonymies tools of semantic expansion.

Panther and Thornburg (2018) are careful to distinguish their use of the notions of source-in-target operations and metonymic domain expansion from the ones postulated in Ruiz de Mendoza and Galera (2014), who see domain expansion as only one type of metonymic activity, the other type being domain reduction, which results in target-in-source metonymies. More details on this approach to metonymy are provided below in section 2.4. Basically, what Panther and Thornburg (2018) object to is the relevance of postulating domain reduction for any kind of metonymy. For these authors, all cases of metonymy are a matter of conceptual elaboration and, as a consequence, of expansion. To make their point clear, they reanalyze an example of what Ruiz de Mendoza and Galera (2014: 120) put forward as a case of *double domain reduction*: *Wall Street is in panic*. According to these authors, *Wall Street* means 'people working at the New York Stock Exchange' as an instantiation of the metonymy PLACE FOR INSTITUTION FOR PEOPLE. The place domain contains the institution, which includes the people associated with the institution (e.g., stockbrokers). In Panther and Thornburg's opinion, however, in the absence of well-delineated criteria to determine domain-inclusion relations, it is better to analyze this metonymy, and all other metonymies, in terms of *conceptual elaboration*, which they alternatively refer to as *expansion*:

> Wall Street is in panic [source] => The New York Stock Exchange located on Wall Street is in panic [target 1] => The brokers working at the New York Stock Exchange located on Wall Street are in panic [target 2].

Since there are two metonymies, there are two targets too. The second target is an expansion of the first, which is an expansion of the metonymic source.

While it is evident that working out metonymic meaning requires the recovery of implicit meaning that is to be added to the initial meaning representation (the point of access), a word of caution is necessary. Metonymic elaboration spells out the form of domain-inclusion relations. This is illustrated by the paraphrase offered by Panther and Thornburg of the Wall Street metonymy. The paraphrase itself makes explicit the domain-inclusion relations. In "the brokers working at the New York Stock Exchange", the notion of 'brokers' is explicitly marked as a subdomain of the place where they work ("working *at* New York Stock Exchange"), which is a subdomain of the street where it is located ("*located on* Wall Street"). Emphasis on the notion of elaboration should not take away from the relevance of domain-inclusion relations as a hallmark of metonymy. These relations are central to the meaning of metonymic uses. This point will be discussed in more detail in the next section.

2.4 Metonymy as a Combination of Cognitive Operations

Ruiz de Mendoza (2000) postulated the existence of two basic metonymic relations: inclusion of the target domain in the source, which produces *target-in-source* metonymies, and inclusion of the source domain in the target, which underlies *source-in-target* metonymies. In later studies (e.g.,

Ruiz de Mendoza and Pérez 2003; Ruiz de Mendoza 2011, 2017; Ruiz de Mendoza and Galera 2014), target-in-source metonymies were related to the cognitive operation of *domain reduction* and source-in-target metonymies to *domain expansion*. The former operation involves narrowing and the latter broadening the scope of the conceptual representation initially called upon by the metonymic expression. Each of these two operations combines with a substitution operation whereby the source takes the place of the target, for which it stands.

As an example of domain reduction, consider the metonymy *General Motors has laid off 100 workers*. Here, the whole (the company), which is the matrix domain, stands for the part, which is one of its subdomains (one or more of the company officers). From a communicative perspective, the burden of responsibility for the layoffs falls on the whole company rather than a portion of its officers. Because of this meaning implication, the metonymy has a greater meaning impact than a more precise literal sentence such as *An executive director in charge of human resources in General Motors has laid off 100 workers*. Pinpointing the exact nature of the target domain is not only expressively cumbersome, but it may be difficult to do (e.g., the speaker may not know who is responsible for the layoffs). This evidences the existence of communicative reasons to use the whole-for-part (or target-in-source) metonymic pattern (one of domain reduction).

Take now domain expansion (not to be confused with Panther and Thornburg's incremental view of elaboration). Part-for-whole (or source-in-target) metonymies are also communicatively economical, but in a different way. Here, the speaker is fully aware of the exact nature of the target domain, but mentions part of it for one of two reasons (or a combination of them):

(i) The source provides a point of focal prominence within the target that is worth considering.
(ii) It is expressively economical to mention just the source since the target naturally follows from world knowledge or the context.

An example of reason (i) is provided by the utterance *The stuffed shirts arrived earlier*. The stuffed shirts are a perceptually prominent part of manner of dressing of some pretentious people, a sign of their ostentatious display of dignity or importance. The metonymy leads us to think of this kind of people from the perspective of their outward appearance. As for reason (ii), consider the utterance *Table 4 wants a refill*. The verbal predicate cues for a human subject that is capable of asking for an additional drink. Since customers in restaurants sit at tables, it easily follows that *table 4* refers to the customer that sits at table 4.

There remains the question of inclusion criteria. Sometimes the direction of inclusion is self-evident. An example is container-content relations, where the content is a subdomain of the container. Consider the elaboration of *He drank two beers* and *He drank the mug.* In the former case, the elaboration is: *He drank two mugs of beer*. From an experience-based conceptual perspective, the beer (the content) is part of the mug of beer (the container with its content). In the latter case, the elaboration is: *He drank the content of the mug*. Here, the content is treated as part of the container. In other situations, the direction of inclusion is less evident. This is particularly the case when the metonymic shift is not grounded in perception. A case point is the controller-controlled relation. If the controller is the source domain, this relation underlies, among others, the metonymy RULER FOR ARMY. This metonymy can be exemplified by the sentence *Napoleon lost the war against Russia*. At first sight, this example is a part-for-part metonymy where Napoleon, as a ruler, stands for the army under his command within the domain of war. But this would require us to think of RULER FOR ARMY as a specification, in the domain of war, of the metonymy CONTROLLER FOR CONTROLLED in the domain of control, which applies both to dynamic states of affairs (*Napoleon rode on his horse*) and to non-dynamic ones (*Napoleon stood between his troops on the hill*) (cf. Dik 1997). In turn, this second metonymy would seem to be a specification of AGENT FOR OBJECT in the domain of action, which is always dynamic. It is evident that there is an

important asymmetry in this chain of specifications: the domains of war, control, and action are not analogous, which means that the three source-target relations work differently. In fact, there are two ways to look at the relationship between Napoleon and the army. In one, our knowledge that Napoleon commanded the French army is part of what we know about him as a ruler, i.e., it is a relevant subdomain of the Napoleon matrix domain. We know about Napoleon that he was emperor of the French, that he married, and later divorced, Joséphine de Beauharnais, that he waged war successfully against several European countries and coalitions, that he was eventually defeated and exiled to Saint Helena, etc.; and, crucially for our example, we know that he commanded the army that fought in Russia. This last knowledge item is the second way to look at the relationship, and it is internal to the first one, which is the primary relation. But it is the secondary relation that has misleadingly inspired an erroneous interpretation of the label RULER FOR ARMY as designating a part-for-part metonymy. In the relationship actually exploited by the metonymy, Napoleon is the matrix domain and the army that he commanded is a subdomain. This view of the RULER FOR ARMY metonymy, where the ruler is the matrix domain and the army under the ruler's command is a subdomain of the matrix, is consonant with the communicative effects of other whole-for-part metonymies. In *General Motors has laid off 100 workers* (COMPANY FOR OFFICERS), we identified a meaning effect consisting in ascribing responsibility to the whole company, the matrix domain, i.e., the responsibility for the layoffs. The public image and reliability of the whole company is at stake when drastic employment measures are taken. In the Napoleon example, we also see Napoleon, the matrix domain, as responsible for losing the war on the Russian front.

2.4.1 Domain Inclusion and Figure/Ground Segregation

The distinction between source-in-target and target-in-source metonymies is grounded in *figure/ground* relations, studied in the psychology of perception. The figure is the more prominent part of a conceptual domain, whereas the background is the less salient part. In one of its applications to linguistics, the figure/ground distinction has given rise to the distinction between *profile* and *base* (Langacker 1987, 1999). The profile of a concept is its inherent content, whereas the base is the conceptual structure against which the concept is profiled. For example, the notion of finger is profiled against the base domain of hand. Evidently, a source-in-target metonymy involves a profile shift within the same base domain, or a shift whereby the base domain of a given profile is itself profiled thus requiring a new base domain. The former situation is exemplified by *Table 4 wants a refill*, which calls for a shift from the table (initial profile) to the customer at the table (new profile) within the restaurant (a relevant base domain for both the table and the customer). The latter is illustrated by *He drank a beer*, which requires a shift from the contents (initial profile) to the container (former base/new profile), which is in turn profiled against other base domains (e.g., shape, size, the person drinking out of it). On the other hand, in a target-in-source metonymy there is only one possible profile shift whereby the initial profiled concept becomes the base domain for the new profile. This applies equally to metonymies with an evident domain-inclusion relation like CONTAINER FOR CONTENT or to those where alternate construal options are, in principle, possible, like RULER FOR ARMY. Thus, in *He drank the bottle*, there is a profile shift from the container (old profile/new base) to the content (new profile), and in the relevant construal of *Napoleon lost the war against Russia*, there is a profile shift from Napoleon (old profile/new base) to the French army under Napoleon's command (new profile).

As for conceptual prominence, source-in-target metonymy endows the source with *default prominence* within the metonymic target, which is the matrix domain. This prominence is retained over the profile shift process in such a way that the source domain is still figure within the ground provided by the new profiled concept. In *Table 4 wants a refill*, the table is conceptually prominent even after the new profile, the customer, has been activated, i.e., the table used to identify the

customer is more prominent conceptually and communicatively more conspicuous than the customer. Conceptual prominence in target-in-source metonymies works differently. This is a situation in which the change of profile brings with it a prominence shift. This is a phenomenon that was identified by Croft (1993) under the label of *domain highlighting*. Domain highlighting consists in giving centrality to a conceptual characterization that has no inherent central status. But Croft (1993) failed to see the connection between highlighting and whole-for-part metonymic patterns resulting from domain reduction. There is no highlighting in part-for-whole patterns, since the source domain is already a salient subdomain of the target and the target is not sensitive to highlighting since it encompasses the whole knowledge structure. In *He drank the bottle*, the highlighted domain is the beverage in the bottle, which is not a central characterization of the notion of bottle, since actually holding a liquid in its interior is not a necessary condition for a bottle to be such (central domains could be shape, size, material, since we cannot think of a bottle without them). Similarly, in *Napoleon lost the war against Russia*, the French army is not a central characterization of our knowledge about Napoleon (as opposed to the centrality of Napoleon being human, for example).

2.4.2 Domain Inclusion and Domain Availability

The different ways in which domain-inclusion, profile/base relations, and conceptual prominence relate are significant to understand another phenomenon that was already treated in detail in Ruiz de Mendoza and Díez (2004): anaphoric reference to metonymic expressions. Scholars have long noted that there are apparent agreement irregularities in the use of anaphoric devices when the antecedent is metonymic. For example, we can say *Table 4 wants his* (but not **its*) *refill*, where the anaphoric pronoun agrees in gender and number with the human target of the metonymy instead of the non-human source. By contrast, consider the use of anaphora in the sentence *Sears has ceased all of its operations in Canada*. In this sentence, the anaphoric pronoun *its* agrees in gender and number with its non-human antecedent, which is the source of the metonymy COMPANY FOR OFFICERS. The human target is not used for the anaphoric operation. A more complex case is provided by *The taxi didn't see me and hit me at some speed, but he(*it) only broke my(*its) bumper.* Here the antecedent of *my* is the speaker's car, which is the non-human target in a POSSESSOR FOR POSSESSED metonymy, whereas the antecedent of *he* is the human taxi driver in a CONTROLLER FOR CONTROLLED metonymy. There is no way to correlate these examples with a purported preference for the animated target domain of a metonymy to be the antecedent, as was suggested by Fauconnier (1985), since either the source or the target, whether animate or not, can take on such a function.

A different explanation was provided by Panther and Radden (1999b: 10), who argued that there is a strong preference to select the foregrounded element of a metonymic relation for anaphoric reference. They first provided the following example:

> *The first violin has the flu. She cannot practice today* / *#It is a Stradivarius*.

In their account, in the metonymic shift, the reference point (the first violin) is backgrounded and the desired target (the first violinist) is foregrounded. Then, they give another example where the reference point (the metonymic source) is foregrounded:

> *My ex-husband is parked on the upper deck. He is taking the bus today / #It has a California license plate*.

Their point here is that the reference point of the metonymy (the ex-husband) is foregrounded and the target (the car) is backgrounded, which allows for anaphoric reference to the ex-husband but not to his car. This analysis, however, is not unproblematic. First, it would be necessary to

provide well-argued criteria to determine when a frame element is foregrounded. These authors seem to suggest that the metonymic shift in the violin example foregrounds the target (the violinist), but then, rather surprisingly, the metonymic shift from the ex-husband to his vehicle has no such effect. And, in a rather circular fashion, they point out that the status of the reference point as the foregrounded element is corroborated by the way anaphora works, when it is anaphoric behavior that we want to predict on the basis of foregrounding (that is, we cannot postulate anaphora as a test of the phenomenon that is supposed to motivate anaphora). Second, as we noted above, profile shifts do not bring about conceptual prominence shifts. In their first example, the first violin is mentioned precisely because of the important role of this instrument for the music session, which is not lost through the metonymic shift. Rather, it is exploited meaningfully. This situation parallels the one for *Table 4 wants his refill*, where *table 4* is mentioned because of its primary role in identifying the customer. In the second example, the vehicle is a highlighted element of what we know about the speaker's ex-husband in his role as a driver. Then, if the violin player and the ex-husband are not necessarily foregrounded elements in the examples above, it follows that anaphoric reference to them is not based on conceptual prominence, but on some other phenomenon.

Another proposal in this respect is found in Ruiz de Mendoza and Díez (2004), which develops previous insights in Ruiz de Mendoza (2000). These authors formulate the *Domain Availability Principle*, which captures a strong gestalt-oriented preference to choose the matrix domain of a metonymic mapping as the antecedent for anaphora. In target-in-source metonymies, the source is the matrix domain, which produces the false appearance of grammatical agreement between the anaphoric pronoun and the metonymic antecedent. This explains why there is agreement between anaphoric *he* in *He is taking the bus today* and its antecedent, *my ex-husband*. It also accounts for agreement between *its and Sears* in *Sears has ceased all of its operations in Canada*, since the company, as the matrix domain, is selected for anaphoric reference. The same principle is capable of dealing with anaphoric reference to a matrix target domain in source-in-target metonymies. This is the case of anaphoric reference to the violin player and the customer (both matrix target domains) in *The first violin has the flu; she cannot practice today* and in *Table 4 wants his refill* respectively.

There are other factors that compete with this principle of anaphoric reference. One of them is conceptual combinability, which holds for cases of double metonymy which offer two matrix domains for anaphoric reference. An example is *Plato is on the top shelf* (AUTHOR FOR WORK FOR MEDIUM), which licenses both *it* and *he* as anaphoric pronouns, but selects one or the other depending on the meaning of the predicate: *It (*he) is bound in leather*/ *He (*it) was a great philosopher*. Another phenomenon is *implicative reference*. This phenomenon is very similar to what Clark (1977) and Clark and Marshall (1981) called *bridging*, which designates anaphoric reference to an (implicated) frame element. In the broader analytical context provided here, implicative reference overrides standard reference to the source or target of a metonymy by choosing instead another relevant frame element outside the metonymic relation. Consider this example:

*I called the doctor's office but they/it/*he/*she said the results weren't ready yet*.

From the point of view of metonymy, the doctor's office (matrix source domain) stands for anyone responsible for the information the patient wants (target subdomain). Using *he/she* as anaphoric pronouns is ruled out since only the matrix domain is available for anaphoric reference, whereas the pronoun *it* is possible, as predicted by the Domain Availability Principle. But interestingly, the generic pronoun *they*, which is not predicted by this principle, is the preferred anaphoric solution. It is not possible to argue that *they* could be anaphoric to the metonymic target. It would be strange to make this claim in the face of the failure of *he/she* to have anaphoric function in this sentence and the correctness of using *it*. The reason for the use of *they* is that this pronoun does not make reference to either of the two domains involved in metonymy, but to a frame element, as a case of implicative reference, which is what is needed, from a communicative perspective, to emphasize

the idea of coordinated work by several people in the doctor's office. Implicative reference is independent of the existence of metonymy, as evidenced by this example:

I went to the doctor's office, but they said the results weren't ready yet.

Implicative reference to a frame element provides a more consistent motivation than conceptual prominence for the following two alternative uses of anaphoric pronoun, taken from Panther and Radden (1999b: 11):

The harpsichord has the flu. His/its part has been taken over by the grand piano.

Unlike the previous examples offered by these authors, this one contrasts the use of a personal and an impersonal pronoun in the same sentential environment. This allows them to reinforce their belief that, in metonymy, source and target are always present as part of the conceptual frame to which they belong, but they are highlighted to different degrees. In the application of this claim to the harpsichord-player example, the choice between *his* or *its* respectively depends on which of the two elements has greater prominence, the player (target) or the instrument (reference point/source). But this claim is easily falsified by the following contextualized modification of one of their previous examples, which also creates a contrastive environment. Imagine the speaker's husband has a very old shaggy car and that he feels ashamed of driving it. One day, they visit a couple of friends and the husband parks the car in a side street before walking into their friends' house. His wife, tired of her husband's attitude, remarks in a rather embarrassing way:

*My husband is parked in the side street, right where he/*it can't be seen.*

This last sentence highlights (i.e., gives prominence to) the husband but, if the speaker had intended to highlight the car, she would have found that the anaphoric use of *it* is not possible. The only solution would have been to explicitly mention the car:

My husband is parked in the side street, right where his car can't be seen.

2.5 Remarks on the Main Definitional Positions

The reader may note that the four positions reviewed above are not necessarily exclusive of each other. In work inspired by Lakoff and Johnson (1980), the emphasis is on the nature of source-target connections, whereas studies inspired by Langacker (1993) highlight the domain-shifting ability of metonymy. Nothing precludes considering metonymy as both a domain-internal mapping and a reference-point phenomenon. In turn, the view of metonymy as elaboration is postulated as a development of the point-of-access view, which, as remarked above, is one important aspect of metonymy that does not seem to be present in other major figures of speech like metaphor or hyperbole (for example, there is no elaboration of the metaphoric source in paraphrasing *rat* as 'the person that betrays others' or of the hyperbolic use of *a ton* in *This weighs a ton* as 'too much'). However, this view of metonymy should be made sensitive to the direction of domain-inclusion relations, which is central to our understanding of this figure of speech. The direction of inclusion is neatly captured by the view of metonymy as a combination of more basic cognitive operations. This approach has some advantages that are worthy of mention:

- It is consistent with the view of metonymy as a one-correspondence mapping within a single conceptual domain where the source domain can be a subdomain of the target domain or the target a subdomain of the source.

- It is compatible with the "afford access" view of metonymy, while distinguishing it from other reference-point phenomena on the grounds of the two domain-subdomain relations arising from the notions of domain expansion and reduction.
- It makes connections between metonymy and other linguistic phenomena. For example, euphemism makes use of substitution (e.g., *My friend is just ample*, where *ample* substitutes for 'fat'), but not of expansion or reduction; on the other hand, focalization is based on domain reduction: *He stole my WATCH!* (stress prominence draws our attention to an item in contrast to any other items from the same class; in this case, the speaker's other belongings).
- It provides analysts with a strong explanatory tool. This tool, as we have seen, allows for the correlation between domain-inclusion types (and expansion/reduction operations) with specific metonymic meaning effects, or for a highly explanatory account of anaphoric reference to a metonymic expression. In Ruiz de Mendoza and Galera (2014) and Ruiz de Mendoza (2014, 2017) this tool shows its efficacy to account for interaction patterns between metaphor and metonymy (see 3.3.1 below).
- It allows us to differentiate metonymy from metaphor (and simile) in terms of their basic components. Metonymy is built on either a domain expansion or a domain reduction operation, which determines domain-subdomain relationships in such a way that a subdomain can stand for a whole domain or, conversely, a whole domain can stand for one of its subdomains. Metaphor, on the other hand, consists in a linguistically implicit resemblance operation (like simile) or in a correlation operation whereby two conceptually discrete domains are placed in correspondence (i.e., conceptually aligned) in such a way that one (called the source) is used to reason about the other (called the target). This approach does not preclude the possible existence of continua (Dirven 1993), blurry boundary lines between metonymy and metaphor (Barnden 2010), or a metonymic motivation for metaphor (Barcelona 2000b), since the cognitive operations involved are very different and because of the domain-internal nature of metonymy versus the domain-external nature of metaphor (see also Ruiz de Mendoza and Galera 2014 and Ruiz de Mendoza 2014 for a critical review of some positions in this respect).
- It casts further light on the claim made by some scholars that mappings based on experiential correlation can be regarded as metonymic rather than metaphoric since correlation leads to conceptual conflation, which places the correlation-based mappings within the context of domain-internal conditions (cf. Kövecses 2013 for discussion). But conflation is a matter of confusing two domains rather than building a single unified concept and, in metaphors based on correlation, unlike in metonymy, one domain is used to reason about the other. Since there are two domains, one is used "as if" it was the other and there is no expansion or reduction of either concept involved. For example, the expression *a close friend* reveals the correlation between intimacy and closeness. As noted above, these two concepts are brought together in situations where people get close to each other when becoming intimate. Intimacy and physical proximity correlate but, even in the scenario described, neither concept is obtained by expanding or reducing the other. Rather, we think about some effects of physical intimacy in terms of corresponding effects in the domain of temperature (e.g., we feel comfortable).

Taking together all these observations, metonymy can be defined as a conceptual mapping based on either domain expansion or domain reduction, where the source domain affords access to and substitutes for the target domain in such a way that, when domain-reduction is required, the target domain is a non-central characterization of the source domain. Metaphor, by contrast, is a cross-domain conceptual mapping whose source domain is used to reason about the target on the basis of its similarity with the target or of source-target frequent co-occurrence in experience.

Given this analysis of the properties of metonymy, we are now in a position to address the taxonomic issue.

3. Metonymy Types

A complete account of metonymy types requires adequate consideration of all its central aspects. These are the following:

(i) The operational nature of the mapping.
(ii) The formal nature of the mapping system.
(iii) The degree of complexity of the metonymic operations.
(iv) The ontological nature of the source and target domains.
(v) The degree of genericity of such domains.

Each of these aspects provides us with a classificatory criterion. Let us discuss how they work.

3.1 The Operational Nature of the Mapping

The taxonomic application of this criterion has already been mentioned. By way of a reminder, domain expansion operations underlie metonymies whose source domain is a subdomain of the target, or *source-in-target metonymies*; on the other hand, domain reduction operations give rise to metonymies whose target domain is a subdomain of the source, or *target-in-source metonymies* (Ruiz de Mendoza 2000).

3.2 The Formal Nature of the Mapping System

Metonymic mappings invariably involve only one correspondence. Metaphor, on the other hand, can be based on one or more correspondences (Ruiz de Mendoza 1997, 2000). This has some consequences that require discussion. For the purpose of contrast, let us first consider *one-correspondence metaphors*. These are of two kinds: first we have mappings whose source domain contains one single concept, such as the correlation metaphors IMPORTANT IS BIG (*She made a big mistake*), SIMILARITY IS CLOSENESS (*These colors are very close*), and AFFECTION IS WARMTH (*She is a warm person*); second, there are mappings where the components of a conceptual cluster are used to put into perspective a highly prominent attribute of the source domain; this is the case of some instances of PEOPLE ARE ANIMALS, like the metaphor *Achilles is a lion*, which singles out the lion's "courage" on the grounds of the lion's fierce, instinctual behavior when fighting other animals (cf. Ruiz de Mendoza and Perez 2011: 178). Both types of one-correspondence metaphor keep the "as if" reasoning process at a minimum:

- In the case of IMPORTANT IS BIG we think of the impact on us of important people, objects, situations, or events in terms of the impact of sizeable objects. Conversely, we think of the impact of unimportant entities and states of affairs in terms of the impact of small objects.
- Underlying SIMILARITY IS CLOSENESS is the reasoning that two objects that resemble each other could well be part of a cluster of similar or identical objects. Conversely, if two objects are not similar, we will not find them close together but far apart.
- In the case of AFFECTION IS WARMTH, we think of our experience of being treated affectively in connection to the experience of being held affectionately. Conversely, lack of affection involves not feeling warmth or being cold.
- In the case of *Achilles is a lion*, the reasoning process is based on the similarity between animal and human behavior in comparable contexts (animal and human fighting).

Now compare the more complex reasoning involved in a *many-correspondence metaphor*. Let us take A PROBLEM IS A LANDSCAPE, where we see a problem as a region (the landscape) to be

explored. In this metaphor, which is grounded in our experience of searching for hidden objects, the solution to a problem is an object hidden somewhere in this region and the evidence used to produce the solution is clues about where the object may be found. Since finding an object that one is looking for involves solving the problem of finding the object, this metaphor is correlational. This experiential correlation is at the core of a system of several source-target correspondences. Such correspondences are exploited in expressions like the following:

> *We need to keep exploring for a solution to this problem*; *We can't find the truth*; *I have no clue as to how to solve this problem*; *It was a fruitless search*; *Working together, they will dig out the truth*.

Resemblance metaphors can also be based on many correspondences. An example is ARGUMENT IS WAR, in which we see people arguing as enemies in a battle. When arguing, like the situation in a battle, people attack their opponent's positions and defend their own; they plan strategies; they gain or lose ground; and they either defeat or are defeated by their opponents. This mapping system is illustrated by linguistic expressions like the following:

> *He was attacked on all sides*; *He didn't know how to counter their claims*; *He was caught by surprise and had to improvise a new argumentative line*; *He almost lost the debate*; *They shot down all his arguments*; *She beat her opponent*; *He inflicted a very severe defeat on them*.

As evidenced by the examples above, the reasoning process in many-correspondence metaphors is more complex than in one-correspondence metaphors. This is a basic difference between the two metaphor types. But there is a still more significant difference. A many-correspondence system allows for the linguistic exploitation of any of the correspondences, which thus acquires temporary conceptual prominence against the background of the rest of the correspondences. This is a matter of highlighting, just as we saw that Croft (1993) postulated for metonymy. In a one-correspondence metaphor there is also a highlighting process, but, in this case, it consists in giving prominence to a selected aspect of the source-target relationship. In *Achilles is a lion* the highlighted element is the kind of behavior that we interpret as "courage" in human terms. Supporting the selection of this element we find the conceptual cluster to which it belongs. In one-correspondence correlation metaphors, the background for the highlighted element is its experiential grounding which includes the source-target correlation.

Formally, metaphors based on a single mapping are closer to metonymy than others. In this respect, it is interesting to note that one-correspondence metaphors involve domain highlighting, like target-in-source metonymies, but unlike source-in-target metonymies. The reason for this is that the source domain of source-in-target metonymies, as discussed in 2.4.1, has default conceptual prominence, so it needs no highlighting. The target, in its turn, is not sensitive to highlighting since it is the matrix domain, which encompasses the whole knowledge structure. On the other hand, in target-in-source metonymies interpretation requires highlighting the intended non-central subdomain within the source domain. This means that, in terms of conceptual prominence, one-correspondence metaphors are closer to target-in-source metonymies than to source-in-target metonymies. Consider the following examples, which are simplified variants of previous examples that are brought in here again for the purpose of contrast:

(1) *My tender* rose *abandoned me* (one-correspondence metaphor).
(2) Starbucks *has closed down one of its Sheffield stores* (target-in-source metonymy).
(3) *The* sax *has not come to today's rehearsal* (source-in-target metonymy).

Understanding (1) requires selecting a feature or a cluster of features that people find characteristic of roses (e.g., their smell, their beauty). These features are highlighted against the rest of the properties of roses (e.g., they have prickles, they grow in north temperate regions, they are perennial, etc.). In (2) *Starbucks* stands for the management of the company. This is a secondary domain that obtains primary status through highlighting. Finally, in (3) the *sax* stands for the sax player. The sax has default prominence, so it does not need to be highlighted. (1) and (2) are closer to each other than to (3) on account of both of them requiring domain highlighting for interpretation. This places one-correspondence metaphorical mappings, together with target-in-source metonymies, at the center of the following continuum based on the relationship between conceptual prominence and the formal nature of the mapping system:

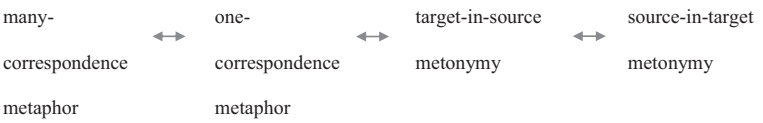


Figure 12.1 Metaphor-metonymy continuum based on the formal nature of the mapping system

3.3 The Degree of Complexity of the Metonymic Operation

We have discussed expansion and reduction cognitive operations. When combined with domain reduction in a sequence, these operations have a very interesting effect. They allow for the economic expression of a complex conceptualization where the final meaning representation contains a conceptually prominent item. For example, in the expression *He has too much lip*, the notion of 'lip' as an instrument of speech affords access to the action of speaking, which is then narrowed down into its ability component (the instrument allows the speaker to speak for as long as he wants). The 'lip' is *per se* conceptually prominent as an instrument in the domain of speaking (that is, it has *default* or *primary prominence*) and in the expression *He has too much lip* it attains *non-default* or *marked prominence* also as enabling the speaker to speak. In what follows, we shall discuss this and other combinatory patterns and identify the nature of the phenomena that they give rise to.

3.3.1 Expansion with Reduction

Expansion and reduction operations may combine into various kinds of metonymic chains (Ruiz de Mendoza 2017: 149–151). Let us just review a few possible combinations. We will use the lesser-than symbol (<) to designate domain expansion and the greater-than symbol (>) for domain reduction:

– *Domain expansion with domain reduction*. This combination is illustrated by the use of the term *radio* in *The radio said it'd be warm today*. On a superficial analysis, the radio, as the medium of communication, stands for the person that uses that medium to communicate. However, the radio as a radio set is only part of the communication system, which has a broadcasting station with equipment. So, the term *radio* (as a radio set) stands for the whole communication system, which stands for the communicator. The first metonymy is based on domain expansion and the second makes use of domain reduction:

> radio set (medium) < radio communication system (broadcasting station and radio receivers) > communicator

– *Domain reduction with domain reduction.* Now consider the use of the name *Kleenex* to mean one of its stellar products, the paper tissue (other less known products are bathroom tissue, paper towels, tampons, and diapers). Since the product is a subdomain of the producer, the underlying

cognitive operation is one of reduction, as in *Do you think people will keep using Kleenex in the future?* But a further reduction operation is added when the product is made to stand for one piece of tissue, as in *I would need a Kleenex*:

Kleenex (trademark) > Kleenex (soft paper tissue) > Kleenex (one piece of tissue)

– *Domain reduction with domain expansion*. A very common metonymy in English and other languages consists in making authors stand for their literary or artistic production: *Shakespeare* is thus Shakespeare's literary production (e.g., *I like Shakespeare*) and *Picasso* is Picasso's paintings (e.g., *She admires Picasso*). These metonymies are based on domain reduction. But we can further extend metonymic activity through domain expansion so that an author's literary or artistic production stands for its medium of presentation, as in *Shakespeare is on the top shelf* (e.g., 'a book containing some or all of Shakespeare's work) and *I have a Picasso in the basement* (e.g., 'a picture painted by Picasso'):

author (Shakespeare, Picasso) > (literary/artistic) production < medium of presentation (e.g., a book, a picture)

– *Domain expansion with domain expansion*. The word *symphony* designates an orchestral composition, but it can also refer to the orchestra playing it (i.e., a *symphony orchestra*) and to the event in which the symphony orchestra plays (e.g., *We enjoyed last Saturday's symphony*) and even to the place in which such orchestral events take place (e.g., *Did you go to the symphony in Washington D.C.?*). Each of these metonymic shifts involves domain expansion:

The instrumental piece < orchestra playing the piece < the event in which the orchestra plays the piece < the place in which the orchestral event takes place

3.3.2 Expansion or Reduction with Resemblance

Resemblance is a characteristic of simile and non-correlation metaphors. When resemblance operations combine with domain expansion or reduction, which are used in metonymy, the result is quite close to what Goossens (1990) termed *metaphtonymy*. Goossens described the patterns that resulted from his analysis of a limited corpus of body-parts, sound items, and violent action predicates (see Ruiz de Mendoza 2014, 2017, for detailed discussion). Ruiz de Mendoza and Díez (2002) and Ruiz de Mendoza and Otal (2002), working with more data, have provided a more systematic analysis based on four broad interaction patterns in which metonymy is subservient to resemblance metaphor. This happens through the metonymic elaboration of either the source or the target domain of a metaphor through domain expansion or reduction. The following patterns provide some illustration of different "metaphtonymic" combinations:

- *Metonymic expansion of the source domain of a metaphor*: *His comments were made tongue in cheek* ('humorously'). Originally, putting one's tongue in one's cheek was an expression of contempt based on the facial expression resulting from pressing the inner part of one's cheek with one's tongue. Then, since some uses of irony convey contempt, this expression was extended to cover ironic remarks, which are sometimes taken as humorous. On a final shift of meaning, this expression was further extended to refer to any remark not made seriously. The original use of the expression was thus based on a situational metaphor whose source depicted the facial expression described above metonymically expanded to include the interpretation of the expression as a sign of contempt (or irony, or humor, in the subsequent meaning shifts). The target domain of the metaphor is any situation in which someone makes a perceptibly derogatory remark (or an ironic or a humorous one) without adopting the "tongue-in-cheek" facial expression.

- *Metonymic expansion of the target domain of a metaphor*: *My lips are sealed*. To seal is to close off an opening to prevent any substance from getting out. The source of the metaphor depicts a situation in which a person seals his lips. This maps onto a target situation in which a person closes his lips tightly to avoid speaking. This target scenario is further developed metonymically to make it include the idea that the speaker has decided not to speak only about confidential information that should not be revealed.
- *Metonymic reduction of the source domain of a metaphor*: *The Iraq war after 2003 became a Second Vietnam*. This metaphor maps war conditions in Vietnam to those in Iraq. As in the Vietnam war, in Iraq the US had its ground forces occupying the country that were vulnerable to local militias. Vietnam, the location in the source of the metaphor, is reduced to the fighting conditions during the war that took place in Vietnam. A "second Vietnam" is a repetition of such conditions. It is these conditions that map onto the target of the metaphor (the Iraq war after 2003).
- *Metonymic reduction of the target domain of a metaphor*: *Please, lend an ear for a moment* ('listen'). The source domain is built on the lending frame. The person that is required to listen is the lender, the person that is asking for attention is the borrower, and the required attention is the object that is being borrowed. This last target item is accessed metonymically from the notion of ear, based on the role of ears in listening.

3.4 The Ontological Nature of the Domains

This criterion concerns the ontological nature of the source and target domains. In the case of metaphor, a rather unquestioned assumption in the beginnings of Cognitive Linguistics, following Lakoff and Johnson (1980) and Lakoff (1993), was that much of our metaphorical thought consists in reasoning and talking about abstract concepts in terms of concrete ones. In the case of metonymy, the assumption was that it was based on concepts that could involve referential shifts, that is, concepts corresponding to real-world entities. However, over the years, these assumptions have been modified. Let us see how. A direct consequence of the abstract-concrete assumption was Lakoff and Johnson's (1980) classification of metaphors into *ontological*, *structural*, and *orientational* (see also Kövecses 2002). In ontological metaphors something concrete maps onto something abstract (*Life has treated her badly* where we see continued misfortune not as haphazard, but as the consequence of the deliberate activity of a willful entity). Structural metaphors present complex abstract concepts in terms of more concrete ones. For example, we can see time, which is abstract, as a specific resource, such as gold, money, or any valuable possession (e.g., *We are wasting precious time*). Orientational metaphors are grounded in our experience of spatial orientations: HEALTHY IS UP/SICK IS DOWN (*He rose from the dead*, *He fell ill*), CONSCIOUS IS UP/UNCONSCIOUS IS DOWN (*Wake up, He sank into a coma*), HAPPY IS UP/SAD IS DOWN (*He's feeling up/down*). This classification has been refined by Ruiz de Mendoza and Otal (2002) and Ruiz de Mendoza and Pérez (2011: 169–172).

Let us now consider metonymy from this same taxonomic perspective. Like metaphor, metonymies can operate on concepts denoting objects (in different degrees of abstraction), scales, events, relations, or situations, at any level of genericity (primary, low, high, cf. section 3.5). So, metonymies can be *situational* or *non-situational*. If non-situational, they can be *scalar*, *eventive* (denoting actions or processes), *relational*, or *object-related*:

1. *Scalar metonymies* make use of one part of a scale to afford access to the whole scale, as a matrix domain, or via the whole to any other part of the scale. Scalar metonymies underlie understatement and overstatement. In understatement, saying *He's not thin* to describe an obese person makes a lower part of the correlated scales of weight and size in people stand for a

higher part. In overstatement, as in the hyperbolic expression *He's as fat as a pig*, a higher point in a scale stands for a lower part. These observations allow us to relate scale-based metonymy to the cognitive operations of mitigation and strengthening, which, in the case of understatement and overstatement, take the form of downscaling and upscaling concepts by certain magnitudes.

2. *Eventive metonymies* are based on action and process frames. For example, a location stands for a conspicuous event that took place there, as in *We don't want Iraq to be a second Vietnam*, referring to the Iraq and Vietnam wars. An event can stand for its duration, as in *During Vietnam, he was held as a prisoner*. At a higher level of representation, an action can be presented as if it were a process by backgrounding the agent. This is very common in the so-called inchoative construction, as illustrated by the sentence *The door opened suddenly*, where *opened* is treated syntactically as an intransitive verb denoting a process (Ruiz de Mendoza and Pérez 2001). From a conceptual perspective, this pretended process stands for the action of some agent or external force opening the door. An interesting example of this kind of metonymy is EFFECT FOR CAUSE, as in *a sad novel*, *a happy ending*, and *a restless night*. Traditionally, expressions like these have been classified as examples of *hypallage*, a figure of thought involving a transferred epithet (e.g., a novel cannot be sad, but the people that read it may feel sad upon doing so). In our view, the adjective (or "epithet") in these expressions captures the effect produced by an event or a situation on the speaker or on the person experiencing them. The underlying cause, which is implicit, is afforded access by the mention of the effect. Thus, a sad novel is a novel that causes sadness, a happy ending is an ending that makes people feel happy, and a restless night is a night in which one feels restless (and thus unwantedly alert) (cf. Ruiz de Mendoza 2020: 29).
3. *Relational metonymies* work on controlled (e.g., *own*, *stand*) or non-controlled relational frames (e.g., *be*, *happen*). An example of exploitation of a controlled relational frame is provided by the metonymy POSSESSOR FOR POSSESSION, as in *This is John* (meaning, for example, 'This is John's mug of coffee'). Non-controlled relational frames capture non-actional, non-processual states of affairs often consisting in the ascription of properties to entities (e.g., expressed through copula support in English). Because of their non-decomposable nature, they are not amenable to metonymic treatment.
4. *Object-related metonymies* exploit the many aspects of part-whole/whole-part structure and non-scalar property-object connections. Some examples of this metonymy type are:

   PART FOR WHOLE: *I want a* roof *over my head* ('a house')
   BODY PART FOR PERSON: *All* hands *on deck* ('sailors')
   ATTRIBUTE FOR PERSON: *He's a* softie ('a weak, sentimental person')
   ATTRIBUTE FOR OBJECT: *I caved in and bought* a diesel *last year* ('a diesel-powered car')
   OBJECT FOR USER: *They are all* stuffed shirts ('smug, conceited, and usually pompous people')

It is of course possible to create more specific descriptive labels for the metonymies above (cf. Barcelona 2018). Here are possible specific labels for some of the examples listed above:

This is John: CUSTOMER FOR ORDER
The door opened: A DOOR (AS IF OPENING BY ITSELF) FOR SOMEONE/SOMETHING OPENING THE DOOR
I want a roof over my head: A ROOF FOR THE SHELTER (PROVIDED BY A HOUSE WITH A ROOF)
All hands on deck: HANDS FOR SAILORS

He's a softie: (NATURE OF) A PERSON'S FEELINGS FOR THE PERSON CHARACTERIZED BY THOSE FEELINGS
I caved in and bought a diesel last year: FUEL TYPE FOR VEHICLE (POWERED BY THAT FUEL TYPE)
They are all stuffed shirts: COSTUME (PROPERTIES) FOR (TYPE OF) WEARER

While the more specific labels are descriptively adequate, since they capture relevant properties of the various metonymic relations, the more generic labels should be preferred by virtue of their greater generalization power.

3.5 The Degree of Genericity of the Domains

Previous work has introduced the notions of primary, low, and high-level cognitive models (Ruiz de Mendoza and Galera 2014). Metonymy can exploit the three kinds. For example, the end of a path, which is a primary notion, can stand for the whole path and for the motion that has taken place along it. In *We will be over the bridge in minutes*, the position "over the bridge" stands for the whole path that the protagonists follow to reach such a position. In turn, low-level cognitive models refer to perceptually accessible entities and/or states of affairs. 'Hand' can stand for 'worker', 'window' for 'window pane', 'vehicle' for 'driver', a location for an event that took place in it, etc. Finally, high-level cognitive models are abstractions over low-level models. A straightforward example is the notions of action, agent, object, instrument, and result, which derive from such low-level notions as hitting (*He hit the ball with a bat*), killing (*The FBI agent killed the serial killer with his own gun*), or painting (*We painted the cabinet doors with a paint sprayer*). These high-level notions can be exploited metonymically. Consider the sentence *I had to pull the trigger* in a context in which the speaker had to kill someone in self-defense. Pulling the trigger is part of the action of shooting a gun and it stands for such an action. Then, the action of shooting the gun stands for the result of the action (A PROMINENT PART OF AN ACTION FOR THE ACTION FOR THE RESULT OF THE ACTION). This is one way in which high-level cognitive models can be exploited metonymically. In it, the high-level model provides a substrate for what is otherwise low-level metonymic activity (one related to pulling triggers and killing people). Another form of exploitation is fully based on the high-level cognitive model itself. This second form acts as a constraint on grammar. This takes place not by triggering a reasoning process, like metaphor, but through the reconstrual of a state of affairs. A more complete study of areas of grammar where metonymy has an impact can be found in Ruiz de Mendoza and Pérez (2001), in Panther et al. (2009) and in Brdar (2017). Here, we will only offer a few selected examples while emphasizing the importance of high-level metonymic complexes to understand the motivation behind some cases of constructional behavior. The following are some examples of linguistic phenomena that are licensed or motivated by metonymy:

(1) Categorial conversion: *He hammered the nail into the wall* ('He used a hammer to drive a nail into the wall') (INSTRUMENT FOR ACTION) (Kövecses and Radden 1998).
(2) Subcategorial conversion: *There is a lot of America in what she does* ('There is much of American lifestyle in what she does') (AN ENTITY FOR ONE OF ITS ATTRIBUTES).
(3) Enriched composition (Jackendoff 1997: 61): *She enjoyed/began the beer* ('She began/enjoyed drinking/selling/bottling, etc. the beer') (OBJECT FOR ACTION).
(4) Parameterization of generic predicates: *This week, he'll do the carpets and I'll do the dishes* ('This week, he will clean the carpets and I will wash the dishes') (GENERIC FOR SPECIFIC).
(5) Intransitivation with object-to-subject promotion: *The door opened* ('Someone or some force opened the door') (PROCESS FOR ACTION).

As with other lower-level uses, high-level metonymy can be used for economy. This is the case of the examples of categorial conversion, enriched composition, and parameterization of generic predicates above. It can also endow the resulting predication with a different representational perspective. In the example of subcategorial conversion, *a lot of America* gives conceptual prominence to the country. As a result, when we think of the values and lifestyle in the target, we do it from the perspective of these attributes being unique to America. In the example of intransitivization with syntactic promotion of the object, we have a case of what Ruiz de Mendoza and Miró (2019) have called a *pretense construction*. The inchoative construction omits the real agent while endowing the syntactically raised object with the prototypical properties of a subject (i.e., agentivity). Of course, this is in origin a communicative strategy in which the speaker acts as if the object acted on itself, which is not possible in the target situation.

High-level metonymic chains are useful to account for the meaning effects and use constraints of some constructions. For example, there are some cases of the middle construction in English that have an evaluative ingredient associated to the result of an action reconstrued as a process. Comparing the sentence *This bread cuts easily* with *This bread cuts well* can illustrate this point. The two sentences fall under the category of pretense constructions, like the inchoative, in that they are formulated as if the object were the agent. But they differ from the inchoative construction in the presence of an evaluative component. In the first one, the adverb *easily* has the process of the action within its scope; in the second one, the adverb *well* addresses the result of the action. This difference is evidenced by the possibility to use a split construction to paraphrase the first sentence but not the second: *It is easy to cut this bread* but **It is well to cut this bread*. The split construction can give prominence to the process but not to the result of the action. In terms of their metonymic motivation, the sentence *This bread cuts easily* is grounded in the (ASSESSED) PROCESS FOR ACTION metonymy, while *This bread cuts well* requires a double metonymic shift that includes the result as part of the target meaning to be retrieved inferentially: PROCESS FOR ACTION FOR (ASSESSED) RESULT. The underlying idea communicated with the support of this metonymy is that, while we know that someone cuts the bread and that the action has a good result, we pretend that there is no agent and that the action simply expresses an inherent property of the object.

It must be noted that the use of certain verbal predicates with the inchoative and middle constructions to the exclusion of others is not only a property of the conceptual compatibility between the predicates and the construction, as would be argued in standard accounts of Construction Grammar like Goldberg's (1995, 2006). The role of the construction to pretend that a state of affairs is different from what it is in reality is only possible through the activity of a high-level metonymy. Then, any verbal predicate which is sensitive to be presented through this metonymic perspective, like *break*, *open*, and *cut*, is a candidate for integration into the construction. Experience is important in this respect. Sometimes we see a door opening or closing but we lack perceptual access to the agent. It is as if the door had opened or closed by itself. When we think of bread, meat, etc. being cut with ease, our focus of attention is on whatever makes the object easy to cut; and so on. We have a similar situation when the instrument of the action is presented as if it were the agent of the action by assigning to it the function of syntactic subject. This assignment, which gives rise to the so-called instrument-subject construction, is also grounded in experience. Think of *The hammer broke the window*, in which the hammer is seen as the entity that does the breaking rather than as an instrument, its real role. The hammer does break the window in the sense that it touches the glass and causes it to break. Our attentional focus can easily lead us to ignore the role of the real agent, the person that handles the hammer.

4. Future Directions

This chapter has argued for a conciliation of descriptive and explanatory frameworks in Conceptual Metonymy Theory. For reasons of space, it has not done full justice to the broad range of proposals

within the field, but it has provided enough evidence that there are major converging aspects of the different approaches to produce a unified explanatory framework. It has outlined the essentials of one such framework, based on the notion of cognitive operation, and has explored some of its potential not only to account for a broad range of phenomena where metonymy plays a role, but also to relate these phenomena to one another in a theoretically constructive way. In any event, either the framework put forward here or any other competing account should stand the tests of *comprehensiveness* and *delicacy*. The former is the ability of a proposal to determine which phenomena are grounded in metonymic activity and to what extent, coupled with ability to account for them in relation to one another. The latter is the ability of a proposal to provide fine-grained descriptions of the phenomena to be included in it. Elaborating a unified account of metonymy that is capable of complying with these two tests is the next logical step in the development of Conceptual Metonymy Theory.

This kind of framework requires previous improvements in data collection and compilation, which should bring corpus linguistics more clearly into the picture, and it also calls for an increasing emphasis on the experimental support of its major postulates, along the lines of previous work carried out by Gibbs (1999, 2007). It also requires a greater cross-linguistic effort. For convenience, the examples in this chapter refer to English, as does the vast majority of the literature. Gathering data from other languages than English and contrasting them is necessary. There has been occasional work of this kind, e.g., Brdar and Brdar-Szabó (2003), for Croatian and Hungarian, and Ruiz de Mendoza and Peña (2008), for Spanish and English. There is also work on individual languages like Chinese (Jing-Schmidt 2008) and German (Michl 2019), to give a few examples. But much more work of both kinds is needed to improve our understanding of metonymic thinking. For example, contrastive work between English and Spanish shows that English makes more extended use of metonymy than Spanish in some areas, especially in grammar. This is the case of categorial conversion (e.g., English *nail* (vb.) from *nail* (n.) versus Spanish *clavar* (vb.) from *clavo* (n.)). The reason for this situation is that Spanish has a richer suffix system than English. This blocks the derivational application of metonymic thinking. It is also the case of the expression of the English inchoative construction, which has only a partial parallel in Spanish. Thus, Spanish uses the reflexive construction with *se* ('itself') as an alternative grammatical solution for intransitivization with object-to-subject promotion (*The door opened* versus *La puerta se abrió* 'the door opened itself') (see Ruiz de Mendoza and Peña 2008; Ruiz de Mendoza and Miró 2019). However, the Spanish verb *abrir* (open) is not insensitive to intransitivization (*La puerta abrió*) but, when it is intransitivized, it conveys a meaning nuance that is not covered by the English counterpart. Without *se* the idea is that there were repeated attempts to open the door before it was actually opened (e.g., *Finalmente, la puerta abrió y pudimos entrar* 'Finally the door opened and we were able to get in'), while the construction with *se* conveys the idea that the speaker is not aware of who or what opened the door. Both the Spanish construction with *se* and the English inchoative are pretense constructions (Ruiz de Mendoza and Miró 2019): in Spanish the speaker pretends that the door opened itself, while in English the speaker pretends that the action is actually a process that has come about without an external agent. The comparative study of structures of this type will certainly provide a deeper understanding of metonymy as a conceptual mechanism.

Note

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Further Reading

Blanco Carrión, O., A. Barcelona, & R. Pannain (Eds.) (2018). *Conceptual Metonymy. Methodological, theoretical, and descriptive issues*. Amsterdam and Philadelphia: John Benjamins. (This is a collection of papers by leading figures in the field of metonymy. It covers methodological issues related to data collection, description, and classification. In addition, it treats topics such as the interaction patterns with metaphor and other metonymies, the reasoning mode of metonymy, and the role of metonymy in constructional behavior, semantic exocentricity, and Spanish sign language.)

Brdar, M. (2017). *Metonymy and word formation. Their interactions and complementation*. Newcastle: Cambridge Scholars. (Although focused on word formation and metonymy, this book displays inroads into relevant topics like the definition of metonymy, lexicalization, and the role of metonymy in grammar. Within word-formation, it covers the impact of metonymy on a broad range of phenomena, among them concatenative word-formation, abbreviations, clipping, lexical blending, reduplication, conversion, compounds, and suffixation.)

Littlemore, J. (2015). *Metonymy. Hidden shortcuts in language, thought, and communication*. Cambridge: Cambridge University Press. (This is a state-of-the-art critical overview of metonymy theory. It covers most of the topics addressed in the present chapter and others including the question of contiguity, the communicative levels of metonymic activity (propositional, illocutionary), active zones, radial categories, and the creative use of metonymy.)

Ruiz de Mendoza, F. J., & Galera, A. (2014). *Cognitive modeling. A linguistic perspective*. Amsterdam and Philadelphia: John Benjamins. (This book, especially sections 2.3.1, 3.1, 4.2, 4.3, and 4.4, frames metonymy theory within a general account of meaning construction based on cognitive operations. It discusses the relationship between metaphor and metonymy and the role of metonymy in complex conceptual characterizations.)

Related Topics

embodiment; image schemas; categorization; standard and extended conceptual metaphor theory

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13
FORCE DYNAMICS

Walter De Mulder

1. Introduction

Force dynamics is a notion developed by Leonard Talmy to designate a schematic conceptual system grounding not only the meaning of causatives, but also that of other verbs and expressions which all express in some way the exertion and interaction of forces or have meanings that can be analyzed as such, be it metaphorically (Talmy 1976, 1981, 1985, 1988, 2000, 2018). In this contribution, we will first sketch the overall structure of Talmy's theory, before presenting the basic Force Dynamic system and its (metaphorical and other) extensions. We will then describe the way Talmy's theory has been used in more experimental research on causality by Wolff (2007) and present an overview of the comments on Talmy's and Sweetser's approaches to the senses of modal verbs. We conclude by suggesting some possible future research topics.

2. Talmy's (Schematic) System of Force Dynamics

2.1 Talmy's Overall Theory of Conceptual Structure and Language

Talmy's theory takes its starting point amongst others in the distinction between closed-class and open-class forms in language. These forms can be distinguished from a formal, a semantic, and a functional perspective. Formally, open-class forms correspond to the largest set of forms in language, which is called "open" because it can always integrate new members. Such forms are, for example, nouns, full verbs (not auxiliaries), adjectives, and ideophones. Closed-class forms constitute a set with fewer members which is said to be "closed" because it is "very hard to add" forms to it (Talmy 2018: 1). This set comprises bound forms such as affixes, inflections, derivations, and clitics, but also free forms such as prepositions, and even word order patterns or "grammatical complexes such as frames and constructions" (Talmy 2006: 255). From a semantic point of view, open-class forms are not constrained with respect to their possible referents, whereas closed-class forms can only express a restricted number of meanings. Thus, most languages have a set of forms expressing number oppositions, whereas no language has, for instance, inflections indicating a referent's color (Talmy 2000: 411). Furthermore, within the category of number, languages can again only make a restricted number of distinctions (such as singular, plural, dual, and paucal).

In the end, for Talmy, the most important feature of both series of forms is functional: whereas the function of open-class forms is to express conceptual content, the function of closed-class forms is to express conceptual structure. In other words, through their closed-class forms, languages impose their conceptualization on the content expressed. These closed-class forms express individual concepts grouped together in categories, which are integrated in their turn into schematic systems. Thus, for instance, English *some* is part of a series of closed-class forms that can be used to express the category of boundedness (in space and time): the result of combining *some* with a noun for an intrinsically unbounded entity such as *water* in *some water* is that water is conceptualized as a bounded entity. Boundedness subsequently groups together with other categories in the schematic system which allows language users to conceptualize time and space and which Talmy (2000: 47, 2018: 12) calls "configurational structure". In its turn, configurational structure is then one of the schematic systems that constitute the "fundamental conceptual structuring system of language" (Lampert & Lampert 2013: 18), which also comprises perspective point, distribution of attention, force dynamics, and cognitive state (Talmy 2000, 2006). On an even higher level, finally, this "language system" is considered to be a substantive cognitive system which is part of our overall cognitive structure (Lampert & Lampert 2013: 13). Talmy does not consider these systems to be modules in the sense defined by authors such as Chomsky, Fodor, or Jackendoff (Deane 1996: 57), however. On the contrary, his conception of our cognitive structure is called "the overlapping systems model of cognitive organization", suggesting that there exist various degrees of overlap between these systems, as can be seen, for instance, by the overlaps between vision and language structure, or, on a lower level, by the fact that boundedness is a category which is applied in the conceptualization of both time and space. This hierarchical character of Talmy's model appears to be in accord with some recent ideas in neuroscience on the functioning of the brain (Talmy 2003: 194), although some caution is always necessary, as the exact relation of conceptual systems to brain structures is still not very well known (Lampert & Lampert 2013: 14–17).

2.2 Force Dynamics

As one of Talmy's schematic systems, Force Dynamics is seen as a notional system structuring the content expressed in language with respect to force interaction by a set of closed-class forms, but also by open-class forms (Talmy 2000: 409, 2018: 59). As pointed out by Talmy (2018: 42), and in compliance with the principles of cognitive linguistics, the system is used to express not reality, but a conceptualization of it. Thus, in a way, (1) and (2) refer to the same scene, but the conceptualization is different:

(1) The ball was rolling along the green.
(2) The ball kept on rolling along the green.

Indeed, the addition, in (2), of the 'honorary' auxiliary *keep -ing* has the effect of evoking the idea that the ball has a tendency to rest, but that this is overcome by some external force acting on it, say the wind. The sentence thus expresses a dynamic opposition of forces that can be broken up into several elements, as in the analysis of CAUSE developed by Talmy (1976: 61), which replaced the traditional analysis of that notion as a primitive, unanalyzed one (see, for instance, Jackendoff 1990; cf. Lampert & Lampert 2000: 217). This analysis has been generalized into the schematic system of Force Dynamics, described by Talmy (2000: 413) in the following terms:

> Underlying all more complex force-dynamic patterns is the (…) opposition of two forces (…). The primary distinction that language marks here is a role difference between the two entities exerting the forces. One force-exerting entity [the Agonist] is singled out for focal

> attention—the salient issue in the interaction is whether this entity is able to manifest its force tendency or, on the contrary, is overcome. The second force entity [the Antagonist], correlatively, is considered for the effect that it has on the first, effectively overcoming it or not.

The system in fact corresponds to a folk model of physical force, with a gestalt-like structure, distinguishing between figure (the Agonist) and ground (the Antagonist) (Talmy 2000: 468, n. 2; Lampert & Lampert 2013: 46–51, 57–58). As the system constitutes a kind of "naïve physics", the notions of force and energy it contains are not to be confounded with scientific notions (Talmy 2000: 410, 455, 2018: 9, 61–62; Lampert & Lampert 2013: 44 n. 1, 57–59). Moreover, although this schematic system is built into language structure (Talmy 2000: 410), it also has a language-independent grounding in our "kinesthetic/somesthetic sensory modality" (Talmy 1983: 257; Lampert & Lampert 2000: 219)—as confirmed by the terms "Agonist" and "Antagonist", which designate in physiology the opposing members of muscle pairs (Talmy 2000: 413). By grounding the Force Dynamics system in non-linguistic kinesthetically based force interactions (Lampert & Lampert 2000: 218), Talmy escapes a criticism of circularity that is frequently formulated with respect to cognitive approaches to language, in saying that the very cognitive structures that are supposed to explain the use and structures of language are in fact themselves first derived from the use of language forms (see for instance Keller 2018: 118).

2.2.1 The Essential System of Force Dynamics and the Basic Force Dynamic Patterns

Talmy (2000: 415; 2018: 44–46) first demonstrates how the system of Force Dynamics can analyze the sentences below, containing (closed-class) forms such as the already mentioned 'honorary' auxiliary *keep -ing* or prepositions such as *because of* and *despite*:

(3) The ball kept rolling because of the wind blowing on it.
(4) The shed kept standing despite the gale wind blowing against it.
(5) The ball kept rolling despite the stiff grass.
(6) The log kept lying on the incline because of the ridge there.

In (3), the ball corresponds to the Agonist and tends towards rest, but is kept in motion by the Antagonist, the wind blowing on it. As the Antagonist continuously impinges on the Agonist, Talmy calls this an example of "extended causation". In (4), the shed, which corresponds to the Agonist, tends toward rest, but, contrary to the ball in (3), it is stronger than the force of the wind and consequently stays in its state of rest. This is called the "first 'despite' pattern" by Talmy (2018: 45, 61). Contrary to (3) and (4), where the Agonist tends towards rest, in (5) and (6), it has a tendency towards motion. In (5) this tendency of the Agonist, the ball, is opposed by the grass, which functions as the Antagonist, but this is not strong enough and the ball's tendency towards motion is realized, despite the grass. This is the "second 'despite' pattern = hindrance" (Talmy 2018: 62). In (6), on the contrary, the ridge, which is the Antagonist, is stronger and blocks the log corresponding to the Agonist; as the Antagonist thus also continuously impinges on the Agonist, this is another case of extended causation, just as (3). The interaction of forces can be analyzed in several components whose interaction is resumed in the following schematic overview, where it must be kept in mind that the result of the interaction is a unified, coherent whole, corresponding to a gestalt-like structure, and not just a result of adding up the different components (see Talmy 2000: 415, 2018: 61 for a diagrammatic representation):

	Agonist tendency		Agonist resultant		Agonist's force relative to Antagonist's	
	toward rest	toward action	action	rest	lesser	greater
(3)	+		+		+	
(4)	+			+		+
(5)		+	+			+
(6)		+		+	+	

The corresponding patterns of forces are called "steady state force-dynamic patterns" as there are no factors added except (the forces of) the Agonist and the Antagonist. In the following patterns, on the contrary, factors are added, leading to changes over time as to the impingement of the Antagonist on the Agonist. Talmy (2000: 417) therefore speaks of "shifting force-dynamic patterns". The first sentence illustrating such a pattern is expressing onset causing of action: the Agonist, which has a tendency towards rest, such as the lamp in example (7), is acted upon by a stronger Antagonist, the ball, that comes into position against it:

(7) The ball's hitting it made the lamp topple from the table.

In (8), the Antagonist, the water, which is brought into position against the Agonist, the fire, is also stronger, but instead of moving the Agonist, it stops it. Talmy (2018: 48, 63) calls this "onset causing of rest":

(8) The water's dripping on it made the fire die down.

Cases such as (7) and (8) correspond in fact to the prototypical events of causation, and together with examples (3) and (6), they form the general causation category, in which the Agonist's resultant state (motion or rest) is the opposite of its initial tendency (Talmy 2000: 418). In the following two patterns, on the contrary, the resultant state of the Agonist corresponds to its initial state; they are expressed by the verb *let* and are called, respectively "onset letting of action" (the prototypical letting-pattern) and "onset letting of rest" by Talmy (2018: 48, 63):

(9) The plug's coming loose let the water flow from the tank.
(10) The stirring rod's breaking let the particles settle to the bottom.

The combinations of the components of these patterns of forces can be summarized as follows (see Talmy 2000: 418, 2018: 63 for corresponding diagrams):

	Agonist tendency		Antagonist's effect		Agonist's resultant	
	toward rest	toward action	causing	letting	starting	stopping
(7)	+		+		+	
(8)		+	+			+
(9)		+		+	+	
(10)	+			+		+

In the patterns corresponding to the following sentences, the Antagonist is stronger than the Agonist and is steadily disengaged; the corresponding sentences thus express, respectively, "extended letting of motion" and "extended letting of rest" (Talmy 2000: 420, 2018):

(11) The plug's staying loose let the water drain from the tank.
(12) The fan's being broken let the smoke hang still in the chamber.

As can already be seen from these sentences, Force Dynamics can be used to represent not only causation (as in examples 3, 6, 7, and 8), but also the concepts expressed by the verb *let* or prepositions such as *despite* and *because of*. It is clear, then, that by analyzing the concept of causation into further elements, Force Dynamics can be used to analyze the concepts expressed by a lot of expressions and constructions in addition to the causatives Talmy analyzed at the beginning and that it can thus be seen as "a generalization over the causative concepts of traditional linguistics" (Talmy 2011: 633, 2018: 50–51; Croft 2012: 203–204). This is confirmed by a series of other sentences, constructions, and expressions which have been analyzed by Talmy (2000; 2018) as well as by other researchers (cf. section 3, but also Lampert & Lampert 2013; and Croft 2012: 204–205) on the basis of his model of Force Dynamics.

2.2.2 Extensions of Force Dynamics

The examples given above express concepts belonging to the domain of physical force interactions. But language users can also apply the system of Force Dynamics by metaphorical extension to express force relations in the psychological domain (Talmy 2000: 410–411, 430–432, 2018: 51), based on a naïve model of the psyche as an interaction of forces, where one part of the self, which wants to perform an action, is opposed by another part. Thus, (13) is a neutral sentence, but (14) expresses, through the adding of the verb *refrain*, an intra-psychical force relation corresponding to a sense of responsibility or propriety:

(13) He didn't close the door.
(14) He refrained from closing the door.

The Force Dynamics system can also be extended to the social domain to express social force interactions (Talmy 2000: 438, 2011: 634, 2018: 53–55), based on an analogy between the direct exertion of force of one object on another to make manifest some action and "one sentient entity's production of stimuli, including communication, that is perceived by another sentient being, and interpreted as reason for volitionally performing a particular action" (Talmy 2000: 438). This can be illustrated by (15) and (16):

(15) He let her present her opinion.
(16) The gang pushed/pressured him to do things he didn't really want to do.

Talmy (2000: 452–453) describes more extended uses of the Force Dynamics system, such as, for instance, to analyze the meaning of "logic-gators" in argumentation, words such as *but*, *besides*, *nevertheless*, *moreover*, *granted*, *instead*, *after all*, or *on the contrary*, which can direct the flow of argumentation by expressing opposition to, or reinforcement of, some of the points argued for.

The last extension of the Force Dynamics system which will be mentioned here concerns its use to analyze the meaning of English modal verbs. These can be identified in English by some particular morphological and syntactic properties, such as the absence of *to* before the infinitive form of the following verb, lack of *–s* in the third-person singular, postponed *not*, and inversion with the subject in questions. These properties are characteristic of verbs such as *can*, *must*, *may*, etc. A restricted series of other verbs, such as *have to*, *be supposed to*, *be to*, or *get to*, which do not display these properties, are nevertheless said to be "honorary" modals, as their meanings and uses are very similar to those of the "strict" modals. All these verbs also allow an analysis in terms of interactions of forces. Thus in (17), the boy can be seen as the Agonist, who has a tendency not to perform the action described in the infinitive (to do his homework), but whose force tendency is overcome by an (implicit and/or contextually given) Antagonist (for instance his parents) who overcomes his tendency not to act and makes him execute the action (Talmy 1985: 326; Boogaert & Fortuin 2016: 516):

(17) The boy had to do his homework.

Other verbs allow a comparable analysis, although the tendencies of the Agonist and Antagonist may vary and the interaction can be physical as in (18) and not psychosocial as in (17):

(18) An electron has to stay in a particular orbit around the nucleus.

Several verbs can express not only a root modal meaning, but also an epistemic one. *May*, for instance, can have a root meaning ('be allowed to') as in (19), where it expresses the absence of a barrier:

(19) John may leave the house.

But in (19), *may* can also receive an epistemic interpretation, when the verb is understood to express the absence of an epistemic barrier to reach a certain conclusion, as is also the case in (20) (uttered when one sees John's car on the parking of the university):

(20) John may be here.

Talmy (2000: 443) extends this part of his analyses even further by claiming that verbs such as *make*, *let*, *have*, and *help* form a larger syntactic category together with the modal verbs cited above, since they also take a *to*-less infinitive complement and have force dynamic reference. The combination of these two categories of verbs then forms what he calls the "greater modal system".

In fact, although Talmy (1988: 87) locates the basic usage of the English modals in the psychosocial, interpersonal domain (Lampert & Lampert 2000: 248), the basic usage of Force Dynamic notions is in his view to be situated in the physical domain. Consequently, the basic usage of the modals is to be explained by a metaphorical analogy, which allows the mapping of the conceptual patterns of Force Dynamics from the physical domain to the social-interactional and the inferential domain of reasoning, where they can ground the modal concepts (Lampert & Lampert 2000: 221, 224).

In contradistinction to Talmy, Sweetser (1984, 1990) holds that the interpersonal, psychosocial domain is basic for the modal verbs, "where *must* is taken as indicating a real-word force imposed by the speaker (and/or some other agent) which compels the subject of the sentence (or someone else) to do the action (or bring about its doing) expressed in the sentence …" (Sweetser 1990: 64; Mortelmans 2007: 874). In her view, modal verbs should be described on three levels: root modality (which includes deontic as well as dynamic modality (e.g., ability)), epistemic modality, as in (19) or (20), and speech act modality, as in (21), where *may* indicates the absence of a barrier in the conversational world:

(21) He may be a university professor, but I doubt it because he's so dumb.

To explain how modal verbs come to express the last two types of modality, Sweetser (1990: 28, 50) starts out from the observation that language users conceive and speak in general of their internal world by using notions and expressions which normally refer to the external world. Due to this general metaphor, reasoning processes, for example, are modeled after real-world actions and presented as subject to compulsions, obligations, etc. Sweetser (1990: 52) thus characterizes modality as "basically referring to intentional, directed forces and barriers" and defines the epistemic use of *may*, as in (19), as the expression of "a potential but absent barrier". What is transferred from the source domain of the metaphor—corresponding to its root sense—to its goal domain—the epistemic domain (Lakoff & Johnson 1980)—is then only its "image-schematic structure" (Sweetser

1990: 61) and not, for instance, the reluctance which is assumed to exist in the compelled person in the root sense (of, for instance, *You must come home by ten (Mama said)*), but which is no longer present in the epistemic domain (of, for instance, *You must have been home last night*) (Sweetser 1990: 61). Image schemas have been defined by Johnson (1987: 29) as recurrent patterns or regularities, which "emerge as meaningful structures for us chiefly at the level of our bodily movement through space, our manipulations of objects, and our perceptual interactions" (also see Lampert & Lampert 2000: 235–244). According to Johnson (1987: 48–57), language users thus develop, amongst others, image schemas of force which can be used to ground the meanings of modal verbs: the image schema of COMPULSION can be used for *must*, that of REMOVAL OF RESTRAINT for *may*, and that of ENABLEMENT for *can*. The question is however, first, what exactly goes into the image schema (see Lampert & Lampert 2000: 241–243 for some critical reflections), secondly, in what sense the schemas identified by Johnson qualify as image schemas (Mandler & Canovas 2014), and thirdly, if they do, whether the preconceptual and embodied nature of image schemas is compatible with the rather abstract character of the representation of Force Dynamics underlying linguistic expressions (Lampert & Lampert 2000: 219). We will come back to the analysis of the modals in section 3.2, but first we turn to the critical questions that have been formulated with respect to Talmy's basic Force Dynamic system.

3. Comments and Elaborations

3.1 Comments on Talmy's Basic System

Talmy's basic system of Force Dynamics essentially consists of three elements: (i) the initial tendency of the Agonist towards rest or motion, (ii) the relative strengths of the Agonist and the Antagonist, and (iii) the resultant of the force interaction. However, several authors, such as Jackendoff (1990: 133–135) and Wolff (2007: 110), have questioned the idea that all more complex Force Dynamic patterns imply an opposition of (two) forces. This idea of Talmy's (see, e.g., Talmy 2000: 414) causes him for instance to hold that in (22), the weaker Antagonist is disengaging (Talmy 1988: 64–65, 2018: 50, 65).

(22) Removing the benches helped the children cross the schoolyard.

However, following Jackendoff (1990), Wolff and Song (2003: 283) propose that the use of predicates such as *help* can also involve concordance rather than opposition between the Agonist and the Antagonist, or, in Wolff's (2007) terms, the patient and the affector (also see Lichtenberg 2018: 58). Consequently, Wolff (2007: 87, 110) holds that the three elements of Talmy's system mentioned above should be reformulated as follows: (i) presence or absence of concordance between the affector and the patient, (ii) tendency of the patient (for the endstate), and (iii) progress toward the endstate ((ii) and (iii) being factors that correspond according to Wolff to elements which were already present in Talmy's elements summed up above). These three features allow him to analyze different concepts, such as CAUSE, ENABLE, PREVENT, and DESPITE (Wolff 2007: 88):

Concept	Patient tendency for endstate	Affector-patient concordance	Result: endstate approached
CAUSE	N	N	Y
ENABLE	Y	Y	Y
PREVENT	Y	N	N
DESPITE	Y	N	Y

Wolff (2007) holds that his model allows him, in a more systematic way than Talmy's, to account for all possible combinations of the three features: beside those mentioned above, he also

distinguishes ENABLE-NOT (N-Y-N) and DESPITE_N (N-N-N), and explains why the two remaining combinations of features are impossible: Y-Y-N, for example, would mean that the patient and affector point toward the endstate, which implies that their resultant must also point to the endstate, but "if the resultant points toward the endstate, the result must occur; hence, the last feature of this combination would need to be "Y", not "N"" (Wolff 2007: 110—see the same page for further differences between Wolff's and Talmy's approaches). The three features summed up above allow Wolff to distinguish different classes of causal verbs. They thus make up what he calls the category level, which serves to define different classes of causal verbs. In his view, however, a complete account of causation needs a second level, which he calls the computational level, at which the distinctions at the category level (such as the three features of tendency, concordance, and result) are redescribed in terms of units of cognition which represent the interaction of forces in the physical world corresponding to causal situations and which he represents by force vectors (Wolff 2007: 87–90; Goldschmidt 2018: 36). To make this more concrete, let us consider, as an illustration, an experimental situation representing a boat crossing a surface of water with a lighthouse on one side and a set of fans on the other, in which the boat initially does not head towards the lighthouse, but is blown off course by the fans and hits the lighthouse in the end. The configuration of forces corresponding to this situation consists of the force generated by the patient (the boat), the force generated by the affector (the fans), and a force resulting from the interaction of these forces, which points to the endstate. Concepts such as CAUSE, ENABLE, PREVENT, and DESPITE, as defined by the three features described above, each correspond to a particular configuration of forces (see Wolff 2007: 90) and the model should be able to predict which events will count as causation rather than enablement or prevention. In the situation described above, for instance, the boat initially moves away from the lighthouse, a situation which corresponds to the value N for the feature "patient tendency to endstate" at the category level, the fans blow in the direction of the lighthouse, which means that the value for the feature "affector-patient-concordance" is N, and, finally, as a result, the boat approaches the lighthouse, implying that the value for the feature "endstate approached" is Y. As this corresponds to the analysis of CAUSE as presented above, the prediction is that subjects participating in the experiment will pick the verb *cause* from a list of expressions they can choose from to describe the situation. This is indeed what happened: the subjects participating in the experiment described the situation by the sentence under (23):

(23) The fans caused the boat to hit the lighthouse.

As Wolff (2007: 87–88) furthermore holds that "people can think about nonphysical causal relationships by analogy to physical causation" (and that force vectors can thus represent not only physical forces, but also social and psychological forces), he partly covers the terrain also covered by Talmy. He has set up several experimental situations such as the one briefly described for (23) in order to verify empirically whether the subjects participating in the experiments are willing to use expressions conveying causal concepts such as CAUSE, ENABLE, PREVENT, DESPITE, etc. in situations corresponding to the features at the category level and the patterns of forces described at the computational level (by vector diagrams). Although his dynamics model is different from Talmy's, Wolff thus provides experimental evidence for the relevance of force and Force Dynamic features in the analysis of dynamic predicates (also see Lichtenberg 2018).

3.2 Comments on the Analysis of Modals

The proposals of Talmy and Sweetser concerning the meanings of modal verbs have met with several criticisms, a first series of which concerns the analyses of the basic uses of these verbs. In a way, this should not really come as a surprise, since Sweetser's (1990: 51–56) analyses of the meaning of most modal verbs already slightly differ from Talmy's, even if she bases her analyses

on his Force Dynamics. Some authors doubt whether the physical domain is basic for the analysis of modal verbs. Winter and Gärdenfors (1995), for instance, hold that psychosocial forces are basic and that these are not derived from an understanding of physical forces; they consequently propose an analysis of (Swedish) modal verbs referring to the power relations between speaker and hearer (or another party). Diewald (1999: 108–109), on the other hand, criticizes Talmy's analysis of *can* (and German *können*) as it is in fact based on the use of that modal verb in combination with the negative particle in sentences such as *John can't go out of the house*. To Talmy, such a sentence signals that John wants to go out of the house, but that there is some barrier opposing that tendency. According to Diewald, however, the idea of blockage and opposition of forces is due to the negative particle and *can* itself expresses no idea of intentionality, but only that the subject has a certain possibility or capacity (also see Lampert & Lampert 2000: 225 n. 63). However, as pointed out by Lampert and Lampert (2000: 254), the fact that Talmy (1988: 77, 79) only analyzes *can* in the context of *not* may suggest that he does not think *can* in itself should be analyzed on the basis of Force Dynamics, an idea that could explain why he never mentions *be able to* and why *can* as such does not have epistemic uses, whereas *cannot* does (a fact also pointed out by Sweetser 1990: 154 n. 17). Finally, Fortuin (2005: 46) argues that the idea of a force is more straightforward in relation to necessity than in relation to possibility, and points out that the kind of force involved in the analysis of verbs expressing possibility probably varies with the verb under study. The idea of taking away a blockage, for instance, seems more fitting for a verb like *succeed* than for the use of *can* in *I can sing very well* (see Narrog 2012: 81, fn. 23, for comparable remarks).

Portner (2009) holds that Talmy's Force Dynamics is unable to explain that deontic modals can be about possible and hypothetical situations, as in the following sentences, which do not entail that Julie paid income tax:

(24) The law compels Julie to pay income tax.
(25) According to the law, Julie must pay income tax.

The same observation can be made for the epistemic modality expressed by *must* in the following sentence:

(26) It must be raining.

In fact, the need to talk about hypothetical events was one of the main reasons why possible worlds were introduced into (formal) semantics. There are nevertheless some elements that suggest that the Force Dynamics framework may be able to explain this aspect of modal meaning. First of all, it must be noted that Talmy (1988: 54) holds that in language's treatment of the concept of force, the Agonist has an initial tendency, either toward motion or toward rest, but that this tendency may be (but does not have to be) overcome by the Antagonist. This is at least compatible with the idea that forces have a *ceteris paribus* property, meaning that "a force has a result that happens only when '(all) things are equal'" (Copley 2019: 138). In other words, the result of a force does not necessarily obtain when other forces block it, an idea that may allow to work out an answer to Portner's query. Copley (2019: 146) points out, however, that in order to do so, a more sophisticated taxonomy of forces will be needed, since contrary to a simple physical force, "an intention or an epistemic force would have to somehow embed a proposition, which would be (at the very least) a set of outcomes, not a single outcome" (Copley 2019: 146). Portner (2009: 114 n. 34) himself suggests another way in which cognitive linguistics might take into account the property of modals to induce reference to hypothetical situations, viz. by referring to Langacker's notion of potency. According to Langacker (1991: 269–270), a modal evokes the conception of an associated activity—one does not simply want or have a physical capacity in the abstract, but one wants *something* or has the

capacity to do *something*. In Langacker's (1991: 270) terms, each modal makes schematic reference to another process, which serves as the landmark. The modal subject is then "the locus of some kind of potency directed at the landmark process, i.e. a physical or mental force that, when unleashed, tends to bring about an occurrence of that process", and Langacker (1991: 270) then goes on to specify that "the unleashing of this force and the consequent realization of the landmark process are potential rather than actual". In other terms, what a modal verb designates is the potential of the force to reach its result or endstate, an idea that Boye (2005: 61) seems to take up when he proposes that the meanings of modal verbs and expressions be defined by reference to the concept of force-dynamic potential (also see Boogaert & Fortuin 2016: 517).

A last point of criticism to be mentioned here concerns Sweetser's analysis of the epistemic interpretation of modals as resulting from a metaphorical transfer from the psychosocial domain (as the source domain of the metaphor) to the epistemic domain (as the goal domain), as illustrated by the paraphrases of the following examples, respectively for *may* and *must* (Sweetser 1990: 61):

(27) a. John may go
"John is not barred by (my or some other) authority from going"
b. John may be there (epistemic)
"I am not barred by my premises from the conclusion that he is there"

(28) a. You must come home by ten (mom said so)
"The direct force (of mom's authority) compels you to come home by ten"
b. You must have been home last night (epistemic)
"The available (direct) evidence compels me to the conclusion that you were home"

Several critical remarks have been made with respect to this analysis:

(i) Langacker (1991) and Pelyvás (1996) point out that Sweetser's metaphorical analysis, if it is right, only applies to a limited number of modals, such as *must*, *have to*, and *may*, but that epistemic uses of *will*, *would*, *might*, *should*, and *ought to* cannot be explained that way, and neither can epistemic adjectives and adverbs. As pointed out by Furmaniak (2011: 44), for that reason, the hypothesis cannot provide a unitary explanation of epistemic uses of English modals or of the semantic class of epistemic expressions.

(ii) Sweetser's analysis is amongst others based on the idea that cross-linguistically lexical items tend to be ambiguous between root and epistemic senses (Sweetser 1990: 49). However, this idea has in the meantime been disconfirmed, for instance by van der Auwera and Ammann (2005) (also see Narrog 2012: 221; and Furmaniak 2011: 45).

(iii) Pelyvás (1996) refers to diachronic evidence, provided amongst others by Traugott (1989: 36), showing that the epistemic meaning of *may* is attested before its deontic one, and argues that both the root and the epistemic uses of *may* have developed from a (now extinct) ability meaning (also see Pelyvás 2000 for this and other critical reflections on Sweetser's and Talmy's analyses).

(iv) From a historical point of view, Traugott and Dasher (2002: 111, 119) point out that the lexical sources of modals, as listed by Bybee, Perkins, and Pagliuca (1994: 188), show little evidence of the semantics of forces and barriers.

(v) Traugott and Dasher show, above all, that a metaphorical transfer is not needed to explain the change from root to epistemic meaning. They note for instance, with respect to *must*, that it expressed ability and permission in earlier Old English, and obligation in later Old English (c. 1000 CE), whereas epistemic *must* only appeared very rarely in Old English texts and did not develop fully until c. 1300 (Traugott & Dasher 2002: 121). This confirms that *must* first had a root sense before an epistemic sense, but Traugott and Dasher hold that the

development of the epistemic sense should be explained not by a metaphoric transfer but by the conventionalization of conversational implicatures first conveyed in ambiguous contexts. This can be illustrated by the following classic example:

(29) Ealle we moton sweltan
All we must die
"We must all die"
(?8th century Exodus, 12.33, Warner 1993: 162, as cited by Traugott & Dasher 2002: 127)

This sentence can receive a deontic interpretation, but in the context an epistemic interpretation, where *must* expresses an inevitable conclusion about the future, is also possible. Indeed, Warner (1993: 162) describes the situation as follows: "The Egyptians force the Jews to leave Egypt, saying: If you Jews do not leave Egypt, we Egyptians will all necessarily die". The epistemic interpretation is also favored by the fact that it is possible to interpret the sentence in such a way that the necessity can be interpreted as having wide scope, that is, scope over the whole proposition:

(30) a. [ealle we, motan (sweltan)] (narrow scope)
b. motan [ealle we, (sweltan)] (wide scope)

As pointed out by Narrog (2012: 225), the wide scope means that the source of authority remains unspecified (an idea which seems reminiscent of Langacker's (1991) analysis of the evolution from root to epistemic meanings in terms of (his notion of) subjectification). However, since the epistemic meaning only became frequent later on, these contexts should probably be seen as preconditions (Diewald 1999), preparing the ground for the semantic change, which only takes place later on, for instance in contexts where the wide-scope, general interpretation is confirmed or reinforced by the use of impersonal constructions or the occurrence of adverbs such as *nede* 'necessarily' (see Goossens 2000: 161; and Narrog 2012: 224–233, for more information; for other analyses, which are based on the idea that the window of attention is displaced from the Agonist and Antagonist to the strength of the (epistemic) force, see Furmaniak 2011: 61–67; and Lampert & Lampert 2000: 232–233, 252–253, 2013: 69–71).

4. Further Applications and Research Questions

It would take us too far to try listing all the applications of Talmy's ideas on Force Dynamics by other researchers to analyze the meaning and functioning of several different kinds of expressions (but see De Mulder 2007 and Copley 2019 for a partial bibliography). It seems worthwhile, however, to point out that his ideas have also been applied outside of semantics, for instance in syntax, where Force Dynamics has been used to analyze grammatical relations (Langacker 1990, 1991; see De Mulder 2007 for a short presentation) or argument realization (Croft 2012), based on the idea that sentences express an action chain. More recently, the concept of Force Dynamics has also been integrated, for instance, into more formal approaches of meaning (see Copley 2019 and the references mentioned in that article).

Besides these multiple new extensions and applications, the theory itself still inspires several highly interesting research questions. Let us conclude by summing up some of them: (i) Can the (schematic) system of Force Dynamics be thought of as an image-scheme as described by Johnson (1987), or should it rather be thought of as a (semantic or cognitive) frame of a more abstract nature? (ii) Which modal expressions can be analyzed on the basis of the system of Force Dynamics (and which cannot)? (iii) In the end, should the evolution of modals' meanings from root to epistemic be

thought of as a metaphorical transfer, a metonymical process, a conventionalization of conversational implicatures or, maybe, as still another kind of process? (iv) In fact, are the epistemic senses of the modals still related to the root meanings? Lampert and Lampert (2000: 252–253, 2013: 70), for instance, suggest that Talmy may consider integrating the epistemic (uses of the) modal verbs as a subcategory of the conceptual system Cognitive State. (v) Finally, a question also inspired by Lichtenberg (2018): Which approach to Force Dynamics is to be preferred as a starting point for further developing ideas on the subject, Talmy's, Wolff's, or Copley's?

Further Reading

There exists a rich literature on various aspects and applications of Force Dynamics. In addition to the references cited at the end of this contribution, and knowing that this is but a partial selection, we suggest the following works for further reading:

William Croft (2012). *Verbs: Aspect and causal structure*. Oxford: Oxford University Press. William Croft has repeatedly referred to Force Dynamics in his work; in this book, he integrates it with aspectual representations to develop a theory of event structure.

Martina Lampert (2015). How attention determines meaning: A cognitive-semantic study of the steady-state causatives *remain*, *stay*, *continue*, *keep*, *still*, *on*. In G. Marchetti, G. Benedetti, & A. Alharbi (Eds.), *Languages and linguistics. Attention and meaning: The attentional basis of meaning* (pp. 207–238). New York: Nova Science Publishers. In line with the works of Lampert and Lampert cited in the references, this article shows how Force Dynamics can be combined with Talmy's recent work on the Attention System of Language.

P. Wolff & R. Thorstad (2017). Force dynamics. In M. R. Waldmann (Ed.), *The Oxford handbook of causal reasoning* (pp. 147–167). Oxford: Oxford University Press. The work of Philip Wolff integrates and adapts Talmy's theory within more experimental approaches to causative notions. This is a recent overview of this line of work.

Christopher Hart (2010). *Critical Discourse Analysis and Cognitive Science: New perspectives on immigration discourse*. Basingstoke: Palgrave. Chapter 7 of this book is devoted to "Force Dynamics and epistemic modality" and can be read as another extension of Force Dynamics to the social domain (also see C. Hart (2011c). 'Force-interactive patterns in immigration discourse: A Cognitive Linguistic approach to CDA', *Discourse & Society, 22*(3), 269–286).

Related Topics

cognitive semantics; construction grammar and frame semantics; image schemas

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14
CONSTRUAL

Zeki Hamawand

1. Introduction

In accounting for the meaning of expressions, linguists adopt two mainstream approaches: Formal Semantics and Cognitive Semantics. Formal Semantics aims to describe the meaning of expressions by means of a system of logic. One theory adopted in Formal Semantics is *reference*. This theory assumes that the meaning of an expression equals its reference. Language is seen as corresponding to the external world in an almost literal sense. In this sense, meaning is objective in nature. It resides in the relationship between an expression and some aspects of the objective world. This theory has given rise to a more sophisticated version, referred to as *truth-conditional* theory. This theory identifies the meaning of an expression with the conditions in the world under which it is true or false. Jackendoff (1983: 29) asserts that the semantic value of a lexical item is reduced to the observable features of a situation. For example, to know the meaning of an expression like *a/the book* one has to check the world and see if the expression is true. A look is enough to tell you whether the statement is true or not. According to this, propositional meanings are accounted for, synonymous expressions are considered free alternatives, and concrete entities are the main focus of analysis. The gist of the reference theory is that language is detached from the world of thought.

Cognitive Semantics, as exemplified by linguists such as Fillmore (1977, 1982), Talmy (1983, 2000), Fauconnier (1985, 1997), Lakoff (1987, 1990), and Langacker (1987, 1991a), takes the relationship between meaning and mind as its central concern. Language and cognition are, thus, considered to be inseparable. Linguistic structure reflects conceptual structure. Cognitive Semantics is built on central assumptions. First, conceptual structure is embodied. The nature of conceptual organization arises from sensory interaction with the external world. Second, semantic structure equals conceptual structure. The meaning of an expression does not refer to an entity in the real world, but to a concept in the mind of the speaker, which is perceptually grounded and experientially based. Third, meaning representation is encyclopedic. The meaning of an expression subsumes vast repositories of knowledge, both linguistic, and non-linguistic. Fourth, meaning construction is conceptualization. The construction of meaning is a dynamic process whereby linguistic units serve as prompts for an array of conceptual operations. Fifth, meaning is constructed and characterized in terms of three theories. In light of the *category* theory, a linguistic expression forms a network of distinct but related senses. In view of the *domain* theory, the meaning of a linguistic expression can only be understood with respect to the domain in which it is embedded. By virtue of the *construal*

theory, the subject matter of the present study, the meaning of a linguistic expression is linked to the way it is construed.

2. Construal

One fundamental theory of meaning with which the present study is concerned relates to *construal*, as laid out in Langacker (1988, 1997). According to this theory, the meaning of an expression resides in the mind of the speaker. Language is seen as representing the way the speaker construes a situation. In this sense, meaning is subjective in nature. The speaker provides the basic meanings coded in language. As Lakoff (1987) and Johnson (1987) contend, much of language can be described as encoding different conceptualizations of experience. The speaker's attitude in shaping utterances is incorporated in the notion of *construal*. Langacker (1987: 487) defines it as "the relationship between a speaker (or hearer) and a situation that he conceptualises and portrays". The speaker is endowed with the ability to construe a situation in more than one way. Alternative conceptual choices result in different linguistic manifestations. The expressions *a book* and *the book* describe the same situation, but they have different meanings. The distinction relates conceptually to a shift in definiteness and linguistically to the use of different articles. The first construes the book as unknown to the speech participants, whereas the second construes the book as part of their common knowledge. The crux of the construal theory is that human thought and language are intimately interrelated.

2.1 Essence

The construal theory identifies the meaning of a linguistic expression with the way its content is construed. The meaning of a linguistic expression is the function of both conceptual content and construal. *Conceptual content* is the property inherent in a situation. It is the meaning that is conventionally associated with an expression. *Construal* is the ability of the speaker to construe a situation differently and use different linguistic structures to represent it in discourse. One and the same situation can be construed in distinct ways depending on the communicative needs. When two linguistic expressions share the same content, they differ in terms of the alternate ways the speaker imposes on their common content. Differences in construal represent differences in experience. Each alternative encodes a distinct meaning. Thus, each alternative is realized in language differently. For example, the verbs *mistreat* and *maltreat* have the same base; nonetheless, they begin with different prefixes, and so have independent uses. In Hamawand's (2009: 143) analysis, the verb *mistreat* implies treating someone unkindly or unfairly. The treatment is haphazard in nature; it amounts to insult or offence. The verb *maltreat* implies treating someone cruelly or brutally. The treatment is willful in nature; it amounts to violence and torture. Construal is then a matter of how a situation is conceptualized and how it is linguistically encoded.

2.2 Premises

The construal theory employed in Cognitive Semantics is based, as mentioned by Hamawand (2016), on fundamental premises that are crucial to the meaning of linguistic expressions, no matter they are lexical or grammatical:

1. A linguistic expression is a symbolic assembly. It has two poles: a semantic pole, its meaning, and a phonological pole, its form. The semantics associated with a symbolic expression is linked to a particular mental experience termed a *concept*, which derives in turn from a *percept*. The phonology associated with a symbolic expression is its perceptible form, which can

be spoken or written. The use of a symbolic expression then involves mapping its meaning onto its form. For example, a linguistic expression like *overtime* is regarded as an association between the semantic structure or meaning 'extra time' and the phonological structure or form /ˈəʊvətaɪm/. To produce an expression like this, language relates its form and meaning.

2. All linguistic expressions posited in language have conceptual content. By *conceptual content* is meant the property inherent in a situation. It is the meaning that is conventionally associated with an expression. Differences in conceptual content signal differences in meaning. Differences in meaning, in turn, trigger differences in form. For example, the two expressions *authentic* and *genuine* denote something real, but they are not synonymous. They construe the thing differently. Each expression is a vehicle of a certain semantic structure. *Authentic* construes something as traditional, as in *It is a friendly restaurant offering authentic Greek food*. By contrast, *genuine* construes something as natural, as in *Is the painting a genuine Picasso*?
3. The use of a linguistic expression is the outcome of the specific construal imposed on its content. By *construal* is meant the mental ability of a speaker to construe a conceived situation in many alternate ways. Each construal is a reflection of a speaker's experience of the world. Differences in construal spell differences in meaning. For example, the two expressions *empathy* and *sympathy* have to do with understanding and caring about someone else's problems, but they are not synonymous. Construal assigns them discrete roles in language. *Empathy* focuses on sharing someone else's feelings, as in *She felt empathy for the refugees*. By contrast, *sympathy* focuses on being sorry for someone, as in *She expressed sympathy for the refugees*.
4. Construal is a multiplex phenomenon, consisting of many dimensions. Each dimension contains sub-dimensions. These sub-dimensions mirror the ways a speaker maps experiences onto language. Language is full of conventions that allow for subtle and nuanced conveyances of experience. Language is an experiential phenomenon intimately related to general cognitive processes. For example, the two expressions *allude* and *refer* share the same proposition. Nonetheless, construal reserves them for independent uses. *Allude* is used to state things indirectly, as in *The reporter alluded to the president's secret fortune*. By contrast, *refer* is used to state things directly, as in *The reporter referred to the $250 million in the president's bank account*.
5. No two expressions are identical or in free variation. Variants reflect different conceptualizations, and as a result are encoded linguistically differently. Two linguistic expressions may have the same conceptual content, but still contrast semantically. The semantic contrast between them is attributable to the imposition of alternate construals on their content. For example, the two expressions *pick* and *select* have the same proposition: choose something from a number of possibilities. Yet, they differ in construal. *Pick* means to choose something without thinking very carefully about it, as in *Pick a card from the pack*. By contrast, *select* means to choose something by thinking very carefully about it, as in *How do you select people for promotion*?

2.3 Advantages

The construal theory is capable of resolving many of the difficulties encountered by previous linguistic proposals, and offers a number of advantages over their analyses. For evidence, see Hamawand (2002, 2007, 2008, 2009, 2011).

1. The construal theory allows the speaker to conceptualize and express a situation in alternate ways, which result in different linguistic manifestations. In complementation, for example, there is a case in which a given verb is followed by a particular type of complement clause representing a different construal. In *He desires to achieve fame*, and *He enjoys achieving fame*, prominence is accorded to the main clause subject who is concerned with the content of

the complement event. The *to*-infinitive refers to a future action, describing the achievement of fame as a longed-for goal. By contrast, the *-ing* gerund refers to an action taking place at the moment of speaking, describing the achievement of fame as a pleasurable activity.

2. The construal theory solicits semantic as well pragmatic factors in the selection of a linguistic expression. In complementation, for example, there is a case in which the same verb is followed by two types of complement clause. Yet, each complement type represents a different construal. In *It is hard to come to terms with being unemployed*, the *to*-infinitive complement clause refers to a situation which has not yet occurred or is about to occur. Pragmatically, the success of the action is not guaranteed. By contrast, in *It is hard coming to terms with being unemployed*, the *-ing* gerund complement clause refers to a situation that has actually occurred, or is occurring at the moment of speaking. Pragmatically, the success of the action is guaranteed.
3. The construal theory focuses both on the form and the distribution of linguistic expressions. The form of an expression is characterized in terms of the particular construal imposed on its conceptual content. The distribution of an expression is the result of the semantic compatibility that exists between its internal parts. The two issues of form and distribution are considered inseparable. This stands in opposition to the trend which focuses only on the structural specificity of expressions. For example, in *Working in the garden cheered him up*, the *-ing* gerund is coherent. This is so because it refers to an actual event, which is supported by the use of the past marker *-ed*. In this context, the *to*-infinitive is incoherent. This is so because the *to*-infinitive refers to a non-actual event.
4. The construal theory solves the phenomenon of synonymy in language, whereby pairs of linguistic expressions, lexical or grammatical, are assumed to have similar meanings. Although such pairs may share some features, they are still distinguishable in actual use. For example, the difference between the lexical items *tasty* and *tasteful* is often encoded morphologically through the use of a different suffix. *Tasty* is used to construe food as in *tasty soup*, whereas *tasteful* is used to construe objects as in *tasteful décor*. Each suffix represents a different conceptualization of experience. Each suffix affects the character of the word by adding a special meaning to it. The two lexical items, therefore, cannot substitute each other freely.
5. The construal theory accounts for the phenomenon of polysemy in language, the coexistence of multiple meanings for a word. The same word can occur in a different context and express a different meaning. The word *key* is a good example of polysemy. In *She opened the door with a key*, it refers to a metal object used to open and close doors. In *She pressed the delete key*, it refers to a button on a keyboard. In *The key to success is hard work*, it refers to a means to success. In *She listened to music played in major keys*, it refers to a scale of musical notes that starts on one specific note. In *The reader will find a key at the front of the book*, it refers to a list of signs used on a map. This shows that the meaning of an expression is not fixed. The new meaning that an expression acquires relies upon the context in which it is used.

3. Dimensions

As mentioned earlier, construal is a multifaceted phenomenon, consisting of various dimensions. These dimensions reflect human basic cognitive abilities and capture the experiential aspects of meaning. Langacker (1991b: ix) points out: "There are many different ways to construe a given body of content, and each construal represents a distinct meaning; this is my intent in saying that an expression imposes a particular image on the content it evokes." The semantic value of linguistic expressions then resides in the dimensions of construal imposed on their content. These expressions are, as Langacker (1987: 98) claims, the linguistic realizations of the speakers' conceptualizations. An example is the dimension of *specificity*: the level of detail included in describing a scene. Following Langacker (2013: 55), one can describe the temperature in different ways. With less

specificity, one can say *it is hot*, with more specificity *it is about 45 degrees*, or with greater specificity *it is exactly 50 degrees*. In describing a situation, the speaker selects a particular dimension from a range of alternatives to structure its conceptual content. Expressions which evoke the same conceptual content can, nonetheless, be semantically distinct because they construe that content in alternate ways.

Before embarking on a classification of the construal dimensions, two notes are in order. First, it is very difficult to draw a comprehensive system of classification for the dimensions of construal. Langacker (1987: 116–137) and Talmy (2000: 40–84) have proposed a number of classification systems for the dimensions of construal. The one presented here, however, provides a unifying framework in terms of which many linguistic phenomena can be captured. It organizes the dimensions of construal into basic types, with each comprising further types. In this regard, no claim of exhaustiveness is made. Second, several dimensions of construal can be involved in the meaning of a single linguistic expression. Each dimension views the conceptual content of the expression in a different way. The dimensions of construal apply to different areas of language. They can be grouped under three main headings: prominence, perspective, and focusing. Each dimension is classified into further dimensions. Prominence is classified into profiling, trajector-landmark alignment, and salience. Perspective is classified into subjectivity, objectivity, and dynamicity. Focusing is classified into foreground versus background and scope.

3.1 Prominence

In a perceptual field, something becomes prominent, and so attracts attention more than its surroundings. In language, by analogy, certain parts of an expression receive more prominence than others, and so become the focus of attention. The act of according the focal status to a substructure within a conceptualization, depending on the needs of the discourse, is referred to as *prominence*. Linguistically, the substructures are placed in different positions within a sentence. The sentences *Lucy hit Karen with a snowball* and *Karen hit Lucy with a snowball* share the same words, but each designates an alternative construal. The sentences involve two persons, but they receive different degrees of prominence. In the first, prominence is conferred on *Lucy*, and so placed in subject position. In the second, prominence is conferred on *Karen*, and so placed in subject position. In sentences involving two arguments, the agent (subject) is more prominent than the patient (object). This is so because it is the subject who initiates and performs the reported action.

Three dimensions of prominence are distinguished: profiling, trajector-landmark alignment, and salience.

3.1.1 Profiling

Within its base, every expression singles out a substructure which functions as the focal point of attention. The substructure is called the *profile*. The process whereby a substructure of a base is designated is referred to as *profiling*. The base is essential for understanding the meaning of the profile. For example, the distinction between a raised sentence and its non-raised variant is, as Langacker (1995: 10–11) claims, a matter of two alternative construals of the same conceptual content. It is a matter of which substructure within a construction is singled out as its profile. In the non-raised variant, *It is likely that Tom will win the lottery*, there is absence of a candidate for profiling. Instead, the whole complement clause is in profile and consequently coded as subject. In the raised variant *Tom is likely to win the lottery*, the raised noun *Tom* is in profile, and consequently coded as subject. The raised noun acts as a kind of topic, and eventually exhibits greater topicality than its non-raised counterpart. It functions as a reference point for the active zone represented by the *to*-infinitival complement clause. Hence, each alternative serves to highlight a different aspect of the content.

In syntax, the dimension of profiling can be evaluated by reviewing active versus passive expressions. As Hamawand (2002: 346) clarifies, the active-passive variants are meaningful expressions which are used in different contexts despite the fact that they evoke the same conceptual content. In an active sentence like *Nigel helped Kathy to make a presentation*, the most important participant *Nigel*, which is the agent of the main event, is in profile and consequently chosen as subject. In a passive sentence like *Kathy was helped to make a presentation*, the most important participant *Nigel* is bypassed in favor of a less important participant *Kathy*, which is in profile and consequently chosen as subject. This shows that in the cognitive approach the selection of an entity as subject or object arises as a result of different conceptualizations. In other words, the function of subject or object assigned to an entity ensues from profiling, and not from the semantic role.

In morphology, the significance of the dimension of profiling, as Hamawand (2007: 188) demonstrates, can be appraised by probing the function of prefixes or suffixes. For example, the bound morphemes *-able* and *-ful* can be attached to the root *respect* to form *respectable* and *respectful*. Yet, they profile different entities within the relationship, and so denote different meanings. In *She is respectable*, the adjective *respectable* is derived from the verb *respect*, which means 'can be respected by others for having good qualities'. The suffix *-able* means 'capable of undergoing the action referred to in the verbal root'. A respectable woman deserves respect by reason of good character, appearance, or behavior. In this construal, the explicit subject is in profile. In *She is respectful*, the adjective *respectful* is derived from the noun *respect*, which means 'showing respect to others for having good qualities'. The suffix *-ful* means 'full of the thing denoted by the nominal root'. A respectful woman has deference for other people and their beliefs. In this construal, the implicit object is in profile.

3.1.2 Trajector-Landmark Alignment

Within every expression, one participant is more prominent than the other. One participant, termed the *trajector*, is the primary focus. It is the focal participant within a profiled relationship. It is the entity construed as being located, evaluated, or described. The other participant, termed the *landmark*, is the secondary focus. The distinction between trajector and landmark in linguistic expressions reflects the more general perceptual phenomenon of figure-ground organization. The assignment of the function of trajector (subject) or landmark (object) to an entity arises as a result of different conceptualizations. Expressions can have the same content, and profile the same relationship, but they are semantically contrastive. The semantic contrast resides in the degree of prominence conferred on the relational participants. Precisely, the semantic contrast between the expressions resides in their choice of trajector and landmark, not in content. To illustrate the dimension of the trajector-landmark alignment, we need to survey some examples.

Take, for example, the spatial relation expressed by *above* and *below* (Langacker 2008: 71). In *The lamp is above the table*, both *the lamp* and *the table* are profiled. However, *the lamp* is the trajector, whereas *the table* is the landmark. *The lamp* is the focus of attention, whereas *the table* functions only as a spatial reference point, and is relatively backgrounded. In *The table is below the lamp*, the situation is reversed. The trajector status is given to *the table*, whereas the landmark status is given to *the lamp*. In addition, consider, for example, the temporal relation expressed by *before* and *after* (Langacker 2008: 72). In *The other guests all left before we arrived*, the trajector status is conferred on *the guests*, whereas the landmark status is conferred on *we*. In *We arrived after the other guests all left*, the trajector status is conferred on *we*, whereas the landmark status is conferred on *the guests*. As can be seen, these expressions designate the same relationship, but differ in meaning because they make different choices of trajector and landmark.

In morphology, the dimension of trajector-landmark alignment, as Hamawand (2008: 114, 112) explains, can be verified by investigating the functions of prefixes or suffixes. For example, the suffixes *-er* and *-ee* can attach to the verbal root *employ* to form new words, but they align the

trajector-landmark status differently. The suffix *-er* derives a noun which profiles the trajector of the verb it combines with. The suffix means 'a person who performs the action named by the verbal root'. For example, an *employer* is a person or an organization that employs people, as in *Kim needs a reference from her former employer*. In this example, *Kim* is the agent of the verb *employ*. By contrast, the suffix *-ee* derives a noun which profiles the landmark of the verb it combines with. The suffix means 'a person who is affected by the action named by the verbal root'. For example, an *employee* is someone who is paid to work for someone else or an organization, as in *Kim is a former employee of the local council*. In this example, *Kim* is the patient of the verb *employ*.

3.1.3 Salience

Within every perceptual field, something becomes more salient than its surroundings. In language, a substructure of a sentence becomes more salient than the rest. *Salience* refers to the quality of a participant of an expression of being noticeable, obvious, and conspicuous. When there are two landmarks in a profiled relationship, they receive different degrees of salience. The primary landmark receives what is called *initial salience*, referring to the most significant participant within a scene. Linguistically, the participant, standing out from the ground, is placed in a certain position in the expression relative to its importance. The secondary landmark has least salience. Consider Langacker's (1987: 39–40) examples on the dative shift. In *He sent a letter to Susan*, it is the direct object *a letter* which is initially salient whereas in *He sent Susan a letter* it is the indirect object *Susan* which is initially salient. Therefore, the two sentences embody different meanings. Only the second implies that *Susan* has received the letter. The meaning of each sentence is reflected by its structure, i.e., symbolized by the presence of *to* and by the juxtaposition of the nominals.

In complementation, as Hamawand (2002: 43) contends, the attachment of varying degrees of salience to the profiled entities within the same content results in various syntactic structures. In a sentence with two entities in profile, the dimension of salience determines which entity is construed as initially salient by the speaker. In construing a causative situation, grammar provides the speaker with two sentential options. If the speaker construes the situation in such a way that s/he selects the complement clause for salience, s/he chooses the bare infinitive as in *They made her accept low-paid jobs*. By contrast, if the speaker selects the subject of the complement clause for salience, s/he chooses the *to*-infinitive as in *They forced her to accept low-paid jobs*. Semantically, the bare infinitive denotes an action that is direct, whereas the *to*-infinitive denotes an action that is indirect. Temporally, in the bare infinitive sentence the main and complement verbs refer to the same stretch of time, whereas in the *to*-infinitive sentence the complement verb refers to a time posterior to that of the main verb.

In sentences with participants in the object position, the dimension of salience has an important influence on their interpretation. The sentences *The farmer sprayed fertilizer on the soil* and *The farmer sprayed the soil with fertilizer* contain the same words but construe the situation in a different way. In the first sentence, the first object is the noun *fertilizer*, whereas the second object is the noun phrase *the soil*. In the second sentence, the first object is the noun phrase *the soil*, whereas the second object is the noun *fertilizer*. In terms of initial salience, in the first sentence it is the direct object *fertilizer*, whereas in the second it is the indirect object *the soil*. As is clear, there is difference in the word order of the grammatical objects and in the type of prepositional material used. Therefore, the two sentences embody different meanings. Each construction is distinct, and so considered a variant. Each construction describes the same situation, but does so in its own way. Of the two sentences, only the second entails that the soil was entirely filled with fertilizer.

3.2 Perspective

In the sphere of perception, a perceiver can see a visual scene from different angles. In the sphere of language, by analogy, a speaker can view a situation differently and adapt his/her viewpoint

accordingly. The particular way of viewing a situation, which can shift according to one's intention, is referred to as *perspective*. Simply, it is a particular way of thinking about a subject, or the viewpoint taken on a situation. The relationship between the perceiver and the perceived entity in the perceptual realm corresponds in the linguistic realm to the conceptual relationship between the speaker and his or her object of conceptualization. Describing a situation often involves shifting attention or emphasis from one part to another depending on the needs of the discourse. Examine the proverbial phrase *Is the glass half empty or half full*? One can describe a glass as *half empty* or *half full* depending on one's perspective towards reality. *Half empty* is associated with a negative attitude or pessimism, whereas *half full* is associated with a positive attitude or optimism. A difference in perspective, therefore, results in a difference in lexical or grammatical structure.

The perspective imposed on a conceptualized scene subsumes two factors: vantage point and viewing arrangement.

The *vantage point* refers to the position from which the same situation is observed and described, resulting in different construals and different structures. It is the actual location of the participants in the speech situation: either of the speaker or the hearer. The importance of vantage point is twofold. Conceptually, it serves as a window through which the speech-act participants can observe the described scene, and so helps to specify the position of the participant who describes the scene. Syntactically, it yields a distinction between expressions where the scene is construed from an external vantage point, i.e., relating to the outside of a thing, and expressions where the scene is construed from an internal vantage point, i.e., relating to the inside of a thing. Let us offer an example. The different wordings in *Sara came in* and *Sara went in* reflect a shift in vantage point. The first involves the vantage point of the speaker who is inside the place. Linguistically, this is shown by the use of the verb *come in*. By contrast, the second involves the vantage point of the speaker who is outside the place. Linguistically, this is shown by the use of the verb *go in*.

The *viewing arrangement* refers to the relationship between the speaker and the situation being described. The importance of the viewing arrangement is twofold. Conceptually, it shows how the speaker relates himself or herself to the scene s/he describes, and so yields two basic types of viewing arrangements. In the *Optimal Viewing Arrangement* **(**OVA), the speaker excludes the self from the described scene. In the *Egocentric Viewing Arrangement* (EVA), the speaker includes the self as part of the described scene. Syntactically, it yields a distinction between expressions which are objectively construed and expressions which are subjectively construed. Let us consider an example. In admonishing her child, an annoyed mother may say either *Don't lie to me!* or *Don't lie to your mother!* (Langacker 1987: 128–132). In the first sentence, the mother includes herself as part of the scene she describes. Linguistically, she uses the deictic pronoun *me*. This gives a subjective perspective of the scene conceptualized. In the second sentence, the mother displaces herself from the person speaking. Linguistically, she uses the descriptive noun phrase *mother* in referring to herself. This gives an objective perspective of the scene conceptualized.

Three dimensions of perspective are distinguished: subjectivity, objectivity, and dynamicity.

3.2.1 Subjectivity

With reference to the dimension of *subjectivity*, the speaker expresses involvement in the situation being described. There is a close relationship between the speaker and the content of the situation. Subjectivity represents the EVA, where the speaker includes himself or herself as part of the scene s/he describes. The scene is construed from an internal vantage point, where the attention is fully focused on the self. Subjectivity concerns a specific situation or a particular person and the private areas of his/her life. That means the judgment is influenced by the speaker's opinions and feelings and not by facts. In the area of language, a subjectively-construed expression is one in which the speaker relates the situation described exclusively to the self. The above-mentioned example *Don't*

lie to me! is subjectively construed because conceptually the mother is included in the scene, and linguistically this is demonstrated by the use of the deictic pronoun *me*.

3.2.2 Objectivity

In connection with the dimension of *objectivity*, the speaker expresses distance from the situation being described. There is a distant relationship between the speaker and the content of the situation. Objectivity represents the OVA, where the speaker excludes himself or herself from the scene s/he describes. The scene is construed from an external vantage point, where the attention is fully focused on some external entity. Objectivity concerns a general situation shared by or affecting most people, and not only the speaker who is describing it. That means the judgment is influenced by facts and not by the speaker's opinions and feelings. In the area of language, an objectively-construed expression is one in which the speaker relates the situation described exclusively to the public. The above-mentioned example *Don't lie to your mother!* is objectively-construed because conceptually the mother is displaced from the scene and linguistically the noun phrase *mother* is used.

In syntax, the dimensions of subjectivity-objectivity can be validated by comparing personal and impersonal complement clauses. As Hamawand (2002: 147) explains, the two clauses can be analyzed as different choices in the construal imposed on the complement scene. The sentence *Robert desires to have some familiarity with computers* is a personal sentence because its subject position is occupied by the lexical noun phrase *Robert*. Therefore, the complement clause represents the perspective of *Robert*. This sentence represents EVA and gives a subjective perspective of the event, which is conceptualized from the vantage point of the main clause subject. The sentence *It is desirable to have some familiarity with computers* is an impersonal complement clause because its subject position is taken up by the pronoun *it*. *It* does not refer to a specific entity. Therefore, the sentence represents the perspective of anyone. This sentence represents OVA and gives an objective perspective of the event, which is conceptualized from the vantage point of the speaker.

3.2.3 Dynamicity

This dimension pertains to how a conceptualization unfolds through processing time. It is about how the mind processes language. Dynamicity can be observed in three cases: mode of scanning, order of presentation, and course of direction.

In the *mode of scanning*, the difference relates to whether the scene described is in motion or still. Speakers demonstrate flexibility by construing a complex scene either sequentially or summarily. In *sequential scanning*, the speaker conceives a situation successively as it evolves through time. In *summary scanning*, the speaker conceives the entire situation in a cumulative fashion. To clarify the point, examine Hamawand's (2002: 66) examples. In *I remember that I fell down the stairs*, the speaker scans the component states of the process of falling individually, like a motion picture. The speaker views the distinct components of the process one by one with the passage of time. Because of that, the verb has a temporal profile. In *I remember falling down the stairs*, the speaker scans the component states of the process of falling collectively, like a still picture. The speaker views all the component states simultaneously. Because of that, the verb lacks a temporal profile.

In the *order of presentation*, the difference relates to the different order of words. The order in which events occur fits with the order in which they are conceptualized. Alternate word orders embody different construal strategies for presenting a scene. A case in point is the semantic effect of preposing a locative expression, as illustrated by Langacker's (2008: 80) examples in *A dead rat lay in the middle of the kitchen floor* and *In the middle of the kitchen floor lay a dead rat*. The two expressions are not semantically equivalent, despite using the same words to characterize the same objective situation. The semantic non-equivalence resides in how the situation is mentally accessed.

Precisely, it resides in the general discourse tendency: given vs. new information. In the first expression, the mental access starts with the subject *a dead rat* which marks the given information in the discourse. In the second expression, the mental access starts with the locative phrase *in the middle of the kitchen floor* which marks the new information in the discourse.

In the *course of direction*, the difference relates to the route in which an event is viewed. Speakers exercise flexibility by construing a complex scene, adopting contrasting directions. This can be seen from a pair of examples like *The hill gently rises from the bank of the river* and *The hill gently falls to the bank of the river*, given by Langacker (2013: 82). The two expressions have the same content, they are, nevertheless, semantically non-equivalent. They describe the same spatial configuration but have contrasting meanings, nonetheless. The contrast lies in the direction of mental scanning, where the distinct directions are realized lexically differently. The conceptualizer constructs an image of *the hill* by tracing a mental path along it in either an upward direction (first sentence) or a downward direction (second sentence). The direction is reflected by the words used: *rises from* induces upward mental scanning, whereas *falls to* induces downward mental scanning.

3.3 Focusing

The speaker's relation to a situation construed is compared with the observer's relation to a scene perceived. In an act of perception, the observer has the ability to single out a particular part of a scene for attention. By analogy, in an act of discourse the speaker has the ability to give attention to one particular part of an expression rather than another. The act of paying special attention to a substructure within a conceptualization, relative to the requirements of communication, is referred to as *focus*. Linguistically, the substructure is placed in a specific position in a sentence. A good example is afforded by inversion. The pair *They will not let him leave under any circumstances* and *Under no circumstances will they let him leave* have the same wording, but they package the content in different fashions. They are structural choices serving different communicative purposes. In the first sentence, the speaker focuses on the whole statement. In the second sentence, the speaker focuses on the negative portion within the statement. The speaker lays great emphasis on the disagreement, and so places the negative phrase *under no circumstances* in the subject position.

Two dimensions of focusing are distinguished: foreground versus background and scope.

3.3.1 Foreground versus Background

The act of perception usually involves the foregrounding of some portion of the perceptual field called the *figure* and the backgrounding of the rest called the *ground*. Attention is focused on the figure, which is thereby more fully present to consciousness than the ground. In language, *foregrounding*, sometimes called *highlighting*, involves attaching the most importance to a particular part in an expression. *Foregrounding* is used for specific communicative purposes and can be achieved grammatically by means of different structures. A clear example is offered by cleft sentences introduced by the preparatory *it*- and *what*-clauses, as in *It was Mark who posted the letter yesterday, It was the letter that Mark posted yesterday*, *It was yesterday that Mark posted the letter*, and *What Mark posted yesterday was the letter*. These structures are called *focusing devices*, and the foregrounded part of the utterance is called the *focus*. The cognitive notions of *profile* and *base*, and *trajector* and *landmark* are developments of the notions of foregrounding and backgrounding.

In syntax, the organization of linguistically encoded spatial scenes reflects figure-ground organization. The *figure*, also known as *trajector*, is the primary participant in a profiled relationship. It is the most important participant. The *ground*, also known as *landmark*, is the secondary participant in a profiled relationship. The subject position corresponds to the figure, whereas the object position corresponds to the ground. The sentences *The football fans swarmed onto the pitch* and *The*

pitch swarmed with football fans describe the same objective situation. Yet, they are distinct. The distinction resides in the organization of the information as figure and ground. It is the question of which participant the speaker selects as foreground and which as background. In the first sentence, the speaker accords the status of figure to the football fans and ground to the pitch. In the second, the speaker accords the status of figure to the pitch and ground to the football fans. As for meaning, only the second sentence entails that the location was filled with the football fans. As is clear, the different meanings result from the different views on the situation.

3.3.2 Scope

The scope of an expression comprises the array of conceptual content that it specifically evokes and relies upon for its characterization. Scope contains the profile and represents the general focus of attention. An expression has a *maximal scope*, i.e., the full extent of its coverage, and an *immediate scope*, the portion directly relevant for a particular purpose. The immediate scope is foregrounded vis-à-vis the maximal scope. The immediate scope is the one with the highest degree of prominence and relevance. It is the general locus of viewing attention with respect to which an expression is interpreted. The maximal scope is vague and non-delimited in reference. It comprises everything a speaker is aware of at a given moment to assess the meaning of an expression. The speaker's scope of awareness is referred to as *field*, i.e., everything evoked in describing a situation. The term *elbow*, for instance, evokes the concept of human body as the maximal scope, and the concept of *arm* as the immediate scope for its characterization. It is specifically the *arm* which is prominent and immediately relevant to the concept *elbow*. The immediate scope is therefore describable as the context necessary for the characterization of the profile.

In syntax, the dimension of scope can be corroborated by scrutinizing extraposed and non-extraposed complement clauses. As Hamawand (2012: 159) shows, the distinction is exclusively a property of construal which gives the speaker the flexibility to construe his/her conceptualization in alternate ways. A non-extraposed complement clause like *To build a house nowadays is easy* takes a narrow view of a situation. The reason is ascribed to the absence of a field represented by *it*. In this type of construal, the complement clause is considered the sole factor in inducing the experience in the speaker. By contrast, an extraposed complement clause introduced by the pronoun *it* like *It is easy to build a house nowadays* takes a broad view of the situation. In this type of construal, the speaker relies on different kinds of knowledge in making the evaluation, in which the complement content is the most important. *It* is the locus of factors inducing the experience in the speaker. The source of the evaluation in the extraposed expression is therefore somewhat larger in scope than in the non-extraposed one, and goes beyond mere observation.

4. Conclusions

In this chapter, I have investigated the phenomenon of construal as one of the central ideas in Cognitive Semantics. Construal refers to the mental ability of a speaker to conceive a situation in alternate ways and express them in language by using different linguistic structures. Two linguistic expressions may have the same conceptual content, but still contrast semantically. The semantic contrast between them is attributable to the imposition of alternate construals on their content. Therefore, an expression's meaning is not just the conceptual content it evokes. Equally important is how that content is construed. Speakers can conceive of a situation according to different dimensions, which result in different expressions. Construal is thus a multifaceted phenomenon, consisting of various dimensions which reflect basic cognitive abilities of humans. Although the classification presented here is not comprehensive, it involves the basic human abilities which capture different kinds of linguistic phenomena. Languages systematically provide means for different

dimensions of construal. The general aim was to show that construal is ubiquitous in ordinary language and therefore highly important. The specific aim was to show how useful construal is in the interpretation of linguistic expressions and in solving linguistic problems.

5. Future Directions

As can be seen from the above discussion, construal is the hallmark of Cognitive Semantics. It is about how humans conceptualize the world, how they create meaning, and how meaning is manifested in language. Two issues of construal are noteworthy. One has to do with linguistic universality: the speaker of any language has the ability to construe one and the same situation in alternate ways. Future research, therefore, should seek to investigate whether languages have similar means to conceptualize situations. This entails classifying languages on typological grounds. The other has to do with linguistic relativity: the speaker of one language may prefer to construe the same situation in one way, whereas the speaker of another language may prefer to construe it in another way. Future research, therefore, should seek to investigate whether languages have different means to conceptualize situations. This entails identifying construal differences between languages.

Further Reading

In addition to Ronald Langacker (1987, 1991a), the notion of construal is dealt with by other linguists such as John R. Taylor and Robert E. MacLaury (1995), Leonard Talmy (2000), William Croft and Alan Cruse (2004), Friedrich Ungerer and Hans-Jörg Schmid (2006), Vyvyan Evans and Melanie Green (2006), and Dirk Geeraerts and Hubert Cuyckens (2007).

Related Topics

cognitive semantics; categorization; concepts and conceptualization

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15
CONCEPTS AND CONCEPTUALIZATION

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1. Introduction

Cognitive Linguistics benefited from neighboring disciplines such as cognitive sciences, psychology, and philosophy at the very beginning of the cognitive linguistic enterprise in the late 1970s and the early 1980s by availing itself of many terminologies from these disciplines. Of those borrowed terminologies, concept and conceptualization are most frequently invoked by cognitive linguists. They are inevitable theoretical constructs in Cognitive Linguistics, thus still being extensively used nowadays in cognitive linguistic studies. In addition to these two terminologies, such relevant notions as conceptual structure, conceptual system, metaphorical conceptualization, metonymic conceptualization, linguistic conceptualization, and cultural conceptualization are also readily at cognitive linguists' disposal. These terminologies more often than not are utilized tacitly amongst cognitive linguists themselves as if they were transparent and self-evident. There is basically no controversy as to "concept", but the term "conceptualization" has been interpreted quite differently by different scholars—even the same scholar's definition may evolve over time (see section 3). Although cognitive linguists have implicitly indicated their stances on relevant issues concerning concept in the description of semantic structure and conceptual structure, and dealt with some related content under the rubric of conceptualization (e.g., Lakoff 1987; Geiger & Rudzka-Ostyn 1993, Nuyts & Pederson 1997; Lakoff & Johnson 1999; Langacker 1999; Sharifian 2011, 2017), a systematic ontological elaboration of these two terminologies *per se* seems to have escaped their attention and this chapter is committed to such a mission.

This chapter is organized as follows. Section 2 presents an explication of cognitive linguistic perspective on concept which is thought to "structure what we perceive, how we get around in the world and how we relate to other people" (Lakoff & Johnson 1980: 3) and probably governs our conceptualization. Section 3 offers an overview of the definitions of conceptualization and attempts to characterize it in terms of six parameters: non-insularity, interactivity, dynamicity, imaginativeness, subjectivity, and embodiedness. Section 4 outlines two critical issues, the psychological issue and the sociological issue, in the investigation of conceptualization and exposits how they are addressed in Cognitive Linguistics. Section 5 concludes this chapter and points out future directions to uncover the mystery of conceptualization.

2. Concepts

Concepts as building blocks of thought and cornerstones of human cognition play a vital role in our mental life. This is perhaps the only relatively uncontroversial argument amongst scholars from a wide range of disciplines such as philosophy, cognitive science, psychology, linguistics, etc. But a considerable number of other issues concerning concept are still the subject of much debate due, at least in part, to divergent theoretical orientations adopted in studies of mind, language, philosophy, psychology, and so on. It is far beyond the scope of this short section to offer a complete overview of relevant studies. Therefore, this chapter will confine itself to the cognitive linguistic stances on concept by focusing on the following issues.

The first issue is about the ontological status of concept. Concepts are of crucial importance to cognitive scientists, philosophers, psychologists, and linguists as well. However, their ontological status is still elusive. According to Margolis and Laurence (2019), three main proposals have been made, that concepts are identified with mental representations, with abilities, and with abstract objects. Cognitive Linguistics, arising in the broad context of the inception of cognitive science and development of cognitive psychology, has primarily borrowed the terminology of concept from these two disciplines in which concepts are primarily taken as mental representations. Therefore, cognitive linguists have not bothered themselves so much with this ontological issue but tend to align themselves with cognitive scientists and cognitive psychologists as is evidenced by the "Cognitive Commitment".

The second issue concerns the structure of concepts, lexical concepts in particular. Following Margolis and Laurence (2019), all theories regarding the structure of concepts are developments of, or reactions to, the classical theory of concepts. According to the classic theory, a concept is a conceptual symbol or mental image with definitional structure and is structured upon a set of componential features which are atomic symbols or images themselves serving as sufficient and necessary conditions. For example, a symbol or image must satisfy a set of features including HUMAN, ADULT, FEMALE, etc., to be applicable as the concept WOMAN. The classic theory of concepts dates back to antiquity in Plato's age and it was not confronted with serious challenges until the 1950s and the 1970s when philosophy and psychology both made revolutionary advances (a detailed summary of criticisms on the classic theory can be found in Laurence & Margolis 1999). During this period, a new perspective on the structure of concepts, the prototype theory of concepts, was initiated. According to the prototype theory, concepts are structured in a fashion with central or typical members of a category and less typical or peripheral members. For example, ROBIN and SPARROW are typical members of the concept BIRD whereas OSTRICH and PENGUIN are atypical ones. The most typical member or the central prototype of a concept is theorized either as an abstraction consisting of a set of characteristic features, or as an exemplar represented in the memory. A concept in this sense is taken as a category manifesting typicality effect and all members, whether typical or not, cluster into the same concept based on family resemblance, with the typicality of each member determined by the degree of family resemblance—the features it shares with other members in the same category. Different concepts may impinge on each other and the boundaries between them are blurred. However, the prototype theory of concepts does not go unchallenged when faced with the problem of prototypical primes, the problem of ignorance and error, the missing prototypes problem, and the problem of compositionality (Evans 2019).

Cognitive Linguistics lines up with the prototype theory of concepts but takes a step further to resolve the above-mentioned problems. As is proposed by Lakoff (1987), concepts are not structured by prototypes in the sense of abstractions composed of a set of characteristic features or exemplars in the memory, but instead in terms of Idealized Cognitive Models (ICMs). ICMs are "relatively stable mental representations that represent theories about the world" (Evans 2019: 287). They are abstracted from a wide range of experiences rather than all possible real-world situations, which results in the fact that they "do not necessarily fit the external world 'correctly'" (Lakoff 1987: 125),

and renders them idealized as theories about the world. A classic example is the concept MOTHER. According to Lakoff (1987: 74–75), the concept MOTHER is itself a cluster ICM structured by a matrix of ICMs including the BIRTH MODEL which defines a mother as the person who gives birth, the GENETIC MODEL which defines a mother as the female who contributes the genetic material, the NURTURANCE MODEL which defines a mother as the female adult who nurtures and raises a child, the MARITAL MODEL which defines a mother as the wife of the father, and the GENEALOGICAL MODEL which defines a mother as closest female ancestor. Different ICMs for the concept MOTHER may be invoked in the actual use of this concept as is exemplified in (1) which gives primacy to the BIRTH MODEL. When one of the ICMs in the matrix is conceived as primary, typicality effects arise. In addition to cluster models, Lakoff (1987) also pointed out that typicality effects can be explained by mismatch between ICMs, metonymy, and radial ICMs. As an illustration, the Pope is a less typical example of the concept BACHELOR because there is a mismatch or conflict between the MARRIAGE ICM and the CATHOLIC CHURCH ICM in which marriage of a member of the clergy is prohibited. When one subcategory of MOTHER, for example the HOUSEWIFE stereotype, stands for the whole, other examples of MOTHER are evaluated and assessed as less typical by reference to this ICM. Furthermore, the cluster model for MOTHER and the metonymic HOUSEWIFE stereotype can be combined to contribute to a composite prototype for MOTHER from which further models, ADOPTIVE MOTHER, FOSTER MOTHER, BIRTH MOTHER, and SURROGATE MOTHER for example, can be derived in the process of combination, and together they form a radial ICM giving rise to typicality effect.

(1) I was adopted and I don't know who my real mother is.

The third issue pertains to the origin of concepts. Cognitive scientists diverge as to this issue and generally two prevalent orientations are identified, i.e., the innate view and the embodied view, based on which generation cognitive scientists fall into. The first generation cognitive scientists harbor a disembodied view making a principled distinction between concepts and experience, or, more generally, between mind and body, and claim that concepts are basically innate, whereas the second generation cognitive scientists maintain an embodied view arguing for the embodied mind, and hold that concepts arise directly from bodily experience, both perceptual and interceptive experiences including sensorimotor experiences and affective states (Lakoff & Johnson 1999; Evans 2015, 2019).

Cognitive linguists belong to the second generation cognitive scientists and endorse the view that concepts are basically embodied. This thesis of embodied concepts has received empirical support from both behavioral and neurological experiments. As is concluded in Evans (2015, 2019), on the one hand, the human sensorimotor system is automatically activated during conceptual processing, and on the other, the use of language and thereby concepts primes language users for such behaviors as they are engaged in corresponding sensorimotor activities, both of which have been demonstrated by the deployment of a wide range of methodologies including functional neuroimaging, transcranial magnetic stimulation (TMS), electroencephalography (EEG), neurophysiological recordings, kinematic analyses, etc. According to the thesis, the concept CAT is not a disembodied conceptual symbol or image mirroring a cat in the real world comprising a set of sufficient and necessary features, but a mental representation directly grounded in our perceptual, sensory, and affective experiences with a real-world cat. Besides a simple concrete concept like CAT, more complex concepts like image schemas are also directly motivated by embodied experiences. For example, the image schema SOURCE-PATH-GOAL results from our recurring bodily experiences of moving from one place to another along a certain route. But how can abstract concepts like LOVE be embodied? The answer is metaphorical conceptualization. That is, they are embodied in terms of concrete concepts and other rudimental concepts such as image schemas. As an illustration, LOVE is conceptualized through metaphorical mappings from those directly

embodied concepts like a concrete concept ROSE in *My love is like a red, red rose* or an underlying SOURCE-PATH-GOAL schema in *Their relationship hit a dead-end street*.

The fourth issue dwells on the relation between language and concept, or more generally, language and thought, that is, whether our thought and specifically the concepts we possess are structured by the language we speak. This issue is also referred to as linguistic relativity or the "Sapir-Whorf Hypothesis". There are two versions of linguistic relativity. The strong version, also called linguistic determinism, holds that language determines our thought in the sense that our concepts are conditioned by the structure of language. However, few linguists accept linguistic determinism because it is severely undermined by findings from other disciplines such as ethology, developmental psychology, cognitive psychology, anthropological linguistics, and language acquisition. For instance, pre-linguistic infants are capable of such thought processes as basic arithmetic operations, and other species without human-like language also exhibit likewise the capability of rudimentary thought processes (Evans 2014). Cognitive linguists assume the weak version of linguistic relativity which advocates that language influences our thought. More specifically, language reflects the conceptual system and thinking patterns. Experiments have found that participants are observed through motion trackers leaning backwards when thinking about the past whereas forwards when thinking about the future under the condition that the future is expressed as being ahead while the past as being behind in their language (Miles et al. 2010), and that if their language encodes emotion in terms of vertical spatial axis, the locations of positive events tend to be shifted upward whereas those of negative ones are shifted downward when they are asked to recall where positive and negative incidents occurred on a map (Brunyé et al. 2012), and the result is in accord with the conceptual metaphor "HAPPY IS UP" and "SAD IS DOWN".

3. Conceptualization: Definitions and Characterization

Cognitive Linguistics prioritizes meaning and has revolutionized semantics by attaching unprecedented importance to human conceptualization. The root of this revolution is attributed to changing views on concepts and the relation between concepts, meaning, and language, as is illustrated in section 2, and a reaction against the traditional philosophical and linguistic perspectives on semantics which equate meaning either with reference or truth condition as in objectivist semantics, or with ideation or image as in the ideational theory of semantics, or with the composition of semantic primitives as in compositional semantics, or with emergent process as in the radical interactive approach to semantics. Cognitive linguists contend that meaning is conceptualization (Langacker 1987; Croft & Cruse 2004; Evens & Green 2006) and this semantic principle has been regarded as one of the basic tenets in the cognitive approach to semantics. However, the term conceptualization adopted by cognitive linguists is elusive and very few if any explicit and revealing definitions have been provided.

Lakoff (1987: 280–281) argued that conceptualization or, in his term, conceptualizing capability consists in the ability to form symbolic structures, the ability of metaphorical projection, and the ability to form complex concepts and general categories. In other words, conceptualization is conceived as cognitive abilities to establish symbolic relations between everyday pre-conceptual experience and basic-level and image-schematic concepts, to map structures in the physical domain onto those in the abstract domain, and to structure complex concepts and general categories upon image schemas. Langacker (1987) was among the first to equate meaning with conceptualization and interpret conceptualization as cognitive processing. Later, he explained that conceptualization in the broadest sense encompasses any facet of mental experience including both novel and fixed concepts; sensory, kinesthetic, and emotive experience; recognition of the immediate context (social, physical, and linguistic), and so on (Langacker 1991: 2); and then subsumed "conceptions that develop and unfold through processing time (rather than being simultaneously manifested)"

under conceptualization (Langacker 2008: 30, 2013: 30). Evans and Green (2006: 162) defined conceptualization as "a dynamic process whereby linguistic units serve as prompts for an array of conceptual operations and the recruitment of background knowledge" and a similar view was found in Evans (2007). Evans (2019: 7) redefined it as "the ways in which we construe or 'see' the range of sensations, experiences, reflections and so on, that make up our mental life", although he was not always consistent in that he sporadically identified conceptualization with simulation. This tendency to parallel conceptualization to construal operations was supported by Croft and Cruse (2004). Complementary to the "procedural interpretation" of conceptualization mentioned above, Sharifian (2011: 3) put forward a "product interpretation"—"products of human cognition collectively as conceptualizations"—and conceptualization thus extends to cover such fundamental cognitive processes as schematization, categorization, metaphors, etc.

Langacker (2008: 31) has made a rather pertinent comment that there are no definite answers to the following questions: What is meant by conceptualization? What is its general nature and specific properties? How to investigate it? And how to describe it? In this chapter we are consonant with the procedural reading of conceptualization and assume that it is a general cognitive processing on the one hand, and on the other a local dynamic processing for linguistic meaning construction. We further identify two levels of conceptualization: primary conceptualization and secondary conceptualization. By primary conceptualization is meant conceptualizations involving schematization, basic-level categorization, construal operations, etc., which are directly embodied thus giving rise to concepts and conceptual structures in the physical domain. In contrast, secondary conceptualization functions on the basis of primary conceptualization involving complex categorization, metaphorical mapping, metonymic mapping, conceptual blending, etc., consequently resulting in more complex concepts and conceptual structures in the abstract domain. With reference to Langacker (2008), it is then proposed that conceptualization can be characterized by, at least, the following six parameters: non-insularity, interactivity, dynamicity, imaginativeness, subjectivity, and embodiedness.

Conceptualization is non-insular, which is explicable from the following two aspects. On the one hand, conceptualization bridges the physical world, the mental world, and the linguistic world. Previously, meaning was thought to be out there in the physical world according to objectivist semantics, that is, the meaning of a linguistic expression is what it refers to (referential theory of meaning), or the condition of its being true (truth-conditional semantics), or the behaviors it triggers (behaviorist theory of meaning) in the physical world. Or meaning is a matter of rule-based composition of semantic primitives within the linguistic world according to compositional semantics. Or meaning exists or is constructed in the mental world as specified in the ideational theory that linguistic meaning is the ideation or image represented by an expression, or in the radical interactive approach that meaning emerges during the process of interaction. However, these approaches to meaning have been impaired by semantic paradoxes and criticized for their biases against some semantic issues and for not being psychologically real, which indicates that these three worlds are not necessarily in isolation. Cognitive Linguistics approaches meaning by attempting to link these three worlds through conceptualization. In line with the cognitive linguistic perspective, the physical world is represented in the mental world and then projected onto the linguistic world through the agent's conceptualization, and in turn, the linguistic world exerts an influence on the mental world and thus constrains, to some degree, the agent's conceptualization of the psychical world. More succinctly, conceptualization cannot go without the object being conceptualized in the physical world, (the mental world of) the conceptualizer, and the carrier of conceptualizations in the linguistic world. In this sense, conceptualization is not insular. On the other hand, conceptualization is not a conceptualizer's simple mental process for the conceptualized localized in a certain faculty, but complicated cognitive processing involving various cognitive faculties occurring in distributed contexts such as bodily experience, sociocultural contexts, social interaction, etc.

Linguistic conceptualization, for instance, not only invokes concepts and conceptual structures relevant to linguistic behaviors, but also the totality of conceptual system underlying all human behaviors. In other words, linguistic conceptualization is not a module isolated from general cognitive processing. In this sense, it is also non-insular. This aspect of non-insularity is coherent with the cognitive linguistic assumption of non-modularity and embodies the "Cognitive Commitment" of Cognitive Linguistics.

Relating to the non-insularity of conceptualization is its interactive nature, by which is meant that conceptualization, although occurring in an individual conceptualizer's mind, is realized through interactions between conceptualizers, between the conceptualizer and the conceptualized, and between the conceptualizer and language. Interactions between conceptualizers primarily resort to language and are essentially based on successful exchanges of meaning whereas meaning is constructed through negotiation in the process of interaction. Or rather, linguistic conceptualization is built upon interactive negotiations between conceptualizers under specific linguistic, physical, social, and cultural contexts. This is also the underlying motivation for the interactivist view that meaning emerges during the process of interaction. The claim is partly true but it ignores other aspects of interactions, i.e., interactions between the conceptualizer and the conceptualized, and between the conceptualizer and language. Interactions between the conceptualizer and the conceptualized exist because the conceptualized as the basis for conceptualization is not mechanically mirrored in the conceptualizer's mind but the conceptualizer takes his/her subjective initiative to represent it. This aspect of interactivity has resulted in variations of conceptualization when the same object is conceptualized by different conceptualizers or the same conceptualizer in different cognitive contexts. For example, "banana" is by default conceptualized as a member of the FRUIT category, but variations may arise as to its prototypicality in this category due to the conceptualizers' different personal experiences. Specifically, it is the prototype for communities where bananas are planted and consumed on a large scale while it may not be for others where this fruit is not local. Such variations are not only observed in primary conceptualization like categorization exemplified above, but also in secondary conceptualization like metaphorical mapping. Cross-cultural metaphorical studies (e.g., Yu 1998; Kövecses 2005, 2015) have demonstrated that source domains vary cross-culturally to a considerable degree in metaphorical conceptualization of the same target domain. These variations are also attributable to difference in interactions between the conceptualizer and the conceptualized. Interactivity of conceptualization with regard to interactions between the conceptualizer and language lies in the fact that the conceptualizer encodes conceptualization in language and conceptualization itself is further influenced by language. On the one hand, conceptualization is encoded in language, or to put it another way it resides in language to the extent that language is considered by cognitive linguists as part of the conceptualizer's general cognition. Any differences in linguistic expressions will necessarily reveal differences in conceptualization. This has been one of the basic tenets advocated in cognitive approaches to grammar, particularly in Construction Grammar as is manifested by the Principle of No Synonymy (Goldberg 1995). According to this principle, the so-called alternation between (2a) and (2b) in fact conveys trivial differences in conceptualization in that (2b) implies that the truck is entirely affected by the hay compared with (2a). The encoding of conceptualizations with trivial differences through diversified linguistic devices within the same language and cross-linguistically has led to syntactic complexity and typological variations. On the other hand, the conceptualizer's conceptualization may be influenced by language. Casasanto (2017), for example, pointed out that linguistic metaphors not only reflect but also modify and even create new ways of conceptualizing abstract concepts. This aspect of interactivity is closely tied to linguistic relativity mentioned in section 2.

(2) a. I loaded the hay onto the truck.
b. I loaded the truck with the hay.

Conceptualization is dynamic and its dynamicity is reflected in the procedural nature of mental experience, temporal nature of cognitive processing, and diachronic development. Conceptualization involves dynamic mental procedures, in particular mental scanning. Example (3) describes a static situation but evokes a mental procedure in which the conceptualizer mentally scans along the stretching of the Great Wall from where the conceptualizer stands to the direction afar. Thus, it encodes a dynamic conceptualization of the situation. This respect of dynamicity contributes to the subtle semantic distinction between (4a) and (4b) which characterizes the same objective situation but activates distinct conceptualizations in terms of the directionality of scanning.

(3) The Great Wall winds its way along the mountain.
(4) a. A line of trees extends from the highway to the river.
    b. A line of trees extends from the river to the highway.

As a way of cognitive processing, conceptualization unfolds through processing time. Langacker (2008: 79) has made it clear that "every conceptualization requires some span of processing time for its occurrence", even the simplest one that is usually experienced as instantaneous and beyond our consciousness, and with more elaborate ones their temporal progressions are more likely subject to awareness. This is quite evident in linguistic conceptualization because meaning construction is not achieved instantaneously but by a temporal process of spreading activation. In the case of a very simple word, *menu*, in *move the mouse pointer to the menu*, its conceptualization as a list of options available to a computer user, vis-à-vis a list of dishes available at a restaurant, requires a prior activation of the COMPUTER domain by the phrase *the mouse pointer* which provides mental access to the target. As for the conceptualization of a complex sentence like *We are seeking to find out what local people want, because they must own the work themselves*, our physiological and psychological limitations in vision, memory, and other aspects as well, render impossible a simultaneous activation and accessibility of all facets of the sentence. This process proceeds construction by construction and clause by clause, and a statement-explanation relation is only available when all constructions within each clause and both clauses are active and accessible. The aspect of dynamicity of conceptualization has been one of the fundamental parameters underlying behavioral, psychological, and neurological experiments on language processing.

Dynamicity of conceptualization with regard to mental experience and cognitive processing is mostly synchronic. Conceptualization is dynamic in diachrony too from both ontogenetic and phylogenetic perspectives. In an ontogenetic timeline, such as in the process of children's language development, conceptualization is not always constant. A case in point is children's development in categorization. It is observed that children are apt to make categorization mistakes in their early stage of language development, for example, referring to various four-legged animals as 'dog' or addressing all men as 'Daddy' (Clark 2009; Bloom 2000), but these mis-conceptualizations will be avoided later. In a phylogenetic timeline, given the evolution of human language, conceptualization may evolve accordingly. This is sufficiently demonstrated in dynamic categorization, or the dynamic nature of categories, which is in turn instantiated by lexical semantic change. For example, 'dog' contemporarily refers to all breeds of dogs and thus denotes a basic-level category but it once referred only to a specific strong and powerful breed of dog and merely denoted a subordinate category. That is, the meaning of 'dog' has been generalized along with the re-conceptualization of the category DOG.

Conceptualization is not a straightforward reflection of the world, or a direct or autonomous derivation of any objective situation, but relies extensively on imaginative abilities instead. In this sense, it is imaginative. Take the conceptualization of imagined entities in the fictive world for example. "Dragon" as a totem of Chinese culture is not a real animal in the physical world and it thus cannot be conceptualized directly through bodily experiences. Its conceptualization is established by imaginative devices such as mental space construction and conceptual blending. Specifically,

mental spaces of DEER, CAMEL, RABBIT, SNAKE, FISH, EAGLE, TIGER, CATTLE derivable from immediate bodily experiences are constructed first and then conceptual elements including ANTLER in DEER, HEAD in CAMEL, EYE in RABBIT, NECK in SNAKE, SCALE in FISH, TALON in EAGLE, and EAR in CATTLE respectively are projected and blended in a blended space. This blended mental representation with emergent structures differing from any of those in input spaces is the Chinese conceptualization of imagined animal dragon. In addition, conceptualization of abstract entities also resorts quite frequently to such imaginative devices as conceptual metaphor and mental space construction, and these imaginative phenomena are extremely pervasive as is illustrated by conceptualizations of abstract entities such as LIFE, LOVE, EMOTION, IDEA (see Lakoff & Johnson 1980; Lakoff & Turner 1989; Kövecses 2005; Wen & Yang 2016, etc.). Even the conceptualization of basic concepts like spatial relations is not immune to imagination. Take the spatial preposition *in* as an illustration. The spatial relation encoded by this preposition is conceptualized through the complex act of imaginative perception in which the conceptualizer conjures up a three-dimensional container with an interior and exterior, and locates a figure relative to the background, i.e., the container itself. As is echoed by Lakoff and Johnson (1999: 31), these kinds of complex acts of imaginative perception are performed "during every moment of our waking lives".

"The mind is inherently embodied" (Lakoff & Johnson 1999: 3), so is conceptualization operating within the mind. Lakoff and Johnson (1999) have offered sufficient evidence to the argument that color concepts, basic-level concepts, spatial relations concepts, body action concepts, general structure of actions and events (or aspect), etc., arise and are understood directly through perceptual and motor capacities. In other words, conceptualization of these concepts involving basic-level categorization, schematization, construal operations, and other cognitive processing, what we call "primary conceptualization", is undoubtedly embodied. Conceptualization of abstract, imagined, or complex concepts relies more on imagination which may seem to intuitively collide with the embodied thesis. However, imagination is not trumped up from nothing. Rather, it is essentially motivated by bodily experiences. Conceptual metaphorical research has verified that abstract concepts are mostly conceptualized via metaphorical mapping from directly embodied concepts. Even the conceptualization of imagined concepts like DRAGON via conceptual blending is based on mental spaces that are constructed on concepts directly derived from perceptual experiences with real-world animals like deer, camel, rabbit, snake, fish, eagle, tiger, and cattle. Thus, conceptualization involving these kinds of imaginative capabilities including metaphorical mapping, conceptual blending and complex categorization, and metonymic mapping as well, is embodied because it is rooted in primary conceptualization. This is also the reason why it is identified as secondary conceptualization.

The embodied nature of conceptualization is the underlying motivation for linguistic universals and variations. Human beings are born with similar physiological structures, equipped with similar neural structures, endowed with the same perceptual and motor capacities, and confronted with a similar physical world. These common properties determine that we behave, perceive, and conceive the world in quite a similar way, which will necessarily give rise to similar conceptualizations, and ensuing similar conceptual structures or semantic structures. In expounding the universalities of emotional metaphors, Kövecses (2010) found that the conceptualization of ANGER in terms of the PRESSURIZED CONTAINER metaphor (e.g., *You make my blood* ***boil***) is universal due to shared physiological processes including body heat, internal pressure, and redness in the neck and face area, and he drew the conclusion that universals of emotional metaphors are attributable to universality of bodily experience. In spite of the universality of embodiment, many other factors including physical and sociocultural contexts may bring about divergence in embodiment, thus breeding variations in conceptualization and consequently conceptual structures or semantic structures. A very clear example is the variations of metaphorical conceptualization of nature between Dutch and Afrikaans (a derivative language of Dutch in Southern Africa). Dirven (1994) compared common metaphors

in Dutch and Afrikaans, and found that Afrikaans conceptualization of nature is pervasively based on metaphors of various kinds of animals whereas such nature metaphors are almost completely unavailable to the Dutch although these two languages are genetically linked. This is caused by differences in embodiment. In particular, Afrikaans people enjoy many more opportunities to gain experience with animals than Dutch people do because of their differences in natural and physical environment.

Conceptualization always conveys the conceptualizer's subjectivity and is therefore characterized by subjectivity. The subjectivity of conceptualization can be described in terms of the asymmetrical relation between the conceptualizer and the conceptualized, and the conceptualizer's manipulation of such relation. On the one hand, there exists an asymmetrical relation between the conceptualizer and the conceptualized whereby the conceptualizer is considered as the default reference point. Consequently, any conceptualization will unavoidably presuppose the conceptualizer's perspective with his/her individual-specific affective experience, subjective belief state, or attitude. In this sense, the same concept, e.g., FAMILY, may be conceptualized with difference marked by the conceptualizer's positive or negative affection. On the other hand, the conceptualizer has complete control over the relation between the conceptualizer and the conceptualized especially in terms of vantage point arrangement and mental scanning imposed on a situation. The same objective situation where a ball A is in a horizontal relation to a ball B can be conceptualized as either A is in front of B when the vantage point is arranged such that A intervenes in the line of sight (assuming that A, B, and vantage point are in alignment), or B is in front of A when the vantage point is such that B intervenes in the line of sight. Similarly, the same activity can either be conceptualized as "she entered the cave" when sequential scanning is adopted or "her entrance to the cave" when summary scanning is adopted.

Although a complete characterization of conceptualization still seems to be inaccessible, we have attempted to provide a set of parameters, including non-insularity, interactivity, dynamicity, imaginativeness, subjectivity, and embodiedness, for an elaboration of what conceptualization would be. This set of parameters may be non-exhaustive but it does shed much light on the nature and properties of conceptualization.

4. Critical Issues concerning Conceptualization

Cognitive Linguistics is primarily concerned with meaning and the tenet of "Meaning is conceptualization" serves as a working hypothesis for Cognitive Linguistics that is manifested in almost all areas of cognitive linguistic studies including categorization, construal, conceptual metaphor and metonymy, mental space, conceptual blending, conceptual structures, Cognitive Grammar, and Construction Grammar, etc. Although not all of the areas of Cognitive Linguistics listed above explicitly claim to be engaged with conceptualization, they have been essentially dealing with two key issues concerning conceptualization, i.e., the psychological issue and the sociological issue.

The psychological issue concerning conceptualization is about what is happening in the mind and brain during the cognitive processing of conceptualization. It focuses on mental experience. Langacker (2008: 31) proposed that this issue can be probed from either a phenomenological or a processing standpoint. The phenomenological standpoint attempts to characterize the mental experience *per se*. Cognitive semantics and a great many other researches in Cognitive Linguistics have adopted this standpoint and been devoted to the characterization of mental experience via linguistic evidence, e.g., what the lexicon reveals about categorization, linguistic linearization about conceptual structuring, linguistic metaphors or metonymies about conceptual mappings, grammatical structure about conceptual structure, linguistic paraphrases and alternations about construal. This linguistic evidence makes the phenomenology of conceptualization more readily accessible and amenable to investigation (Langacker 2008).

The processing standpoint is based on the phenomenology of conceptualization and tries to fathom the processing activity constituting the mental experience. The processing activity is observable by recourse to various methodological means including psycholinguistic experiment, clinical research, neurological imaging, and computer modeling (Langacker 2008). Cognitive Linguistics has benefited quite a lot from this standpoint. Its very advent has been possible due to psychological findings of processing activities in categorization and gestalt through behavioral experiments. Recent years have witnessed a quantitative turn in Cognitive Linguistics (Janda 2013, 2017) and more advanced experimental technologies such as eye-tracking, ERPs, and fMRI in psychology have been introduced into cognitive linguistic research. Currently, most cognitive linguistic research on processing activities of conceptualization has been confined to the processing of figurative language, especially metaphors. For example, Coulson and Patten (2002) discussed the processing of metaphors through ERPs technology and found that the understanding of metaphors requires more cognitive effort than literal language does, but both metaphors and non-metaphorical language are understood through the same cognitive mechanism. They further demonstrated that metaphorical conceptualization involves conceptual integration. Citron, Güsten, Michaelis, and Goldberg (2016) were also attracted by the processing of metaphor but their experiment was conducted through the technology of fMRI, and they were interested in how metaphor processing is related to other processing activities. It is observed in their experiment that brain regions relating to processing of emotions are simultaneously activated during the processing of metaphor, which indicates a significant correlation between metaphoricity and emotion. Their experiment further validates that metaphorical conceptualization and linguistic conceptualization in general are inseparable from other cognitive processing, which in turn offers solid proof for the "Cognitive Commitment" in Cognitive Linguistics. Cognitive linguistic studies on conceptualization from the processing standpoint are conducive not only to unveiling the myth of processing activities constituting the mental experience, but also provide converging evidence for theoretical hypotheses and assumptions shared by practitioners of Cognitive Linguistics which will definitely promote the development of the cognitive linguistic enterprise.

The sociological issue concerning conceptualization is about how conceptualization is distributed among the society. It focuses on the sociocultural experience. This issue has been extensively addressed by research on sociocultural universality and variations. Although cognitive linguists were already aware of cross-cultural universality and variations of conceptualization at the very beginning when Cognitive Linguistics grew out of research on conceptualization of color concepts in different societies which forms the basis for the prototype theory of categorization, the sociological issue of conceptualization did not receive due attention until the social turn of Cognitive Linguistics (Harder 2010) and the emergence of Cognitive Sociolinguistics (Kristiansen & Dirven 2008; Geeraerts et al. 2010; Pütz et al. 2014; Frank et al. 2008). Cognitive linguists have invested most of their energy and passion in exploring universality and variations of metaphors and metonymies (e.g., Kövecses 2005, 2015; Sharifian 2011, 2017; Sharifian et al. 2008; Sharifian & Palmer 2007; Zhang 2016) when tackling this issue. Gijssels and Casasanto (2017) examined the conceptualization of TIME by focusing on the metaphorical mapping between TIME and SPACE through cross-linguistic data collected from a series of experiments, and found that cultural practices and artifacts and cultural attitudes can influence the conceptualization of TIME in terms of SPACE. Kövecses (2005) carried out more systematic studies on metaphors across cultures and attributed universality of metaphorical conceptualization to universal bodily experience and its variations to differences in any of the following components that compose metaphors: source domain, target domain, experiential basis, neural structures corresponding to the source and the target in the brain, relationships between the source and the target, metaphorical linguistic expressions, mappings, entailments, blends, non-linguistic realizations, and cultural models. He explained further that variations in metaphorical conceptualization are deeply rooted in factors

including differential experience and differential cognitive preferences or styles. Zhang (2016) did a quantitative study on metonymy for PERSON from a cross-linguistic perspective, and analyzed metonymic variations between Chinese and English. She identified three main kinds of metonymic variations, namely, variation in patterns for PERSON in general, variation in patterns for PERSON of specific kinds, and variation in sources of a pattern, and argued that these variations are caused by culture elements including paragon, clothing, and location notions, etc. A glimpse of research on universality and variations of metaphorical and metonymic conceptualization has cast important light upon the sociological issue concerning conceptualization.

In summary, we have outlined two critical issues concerning conceptualization in this section: the psychological issue, and the sociological issue, with the former approaching conceptualization from within, and the latter from outside, and we have briefly introduced how Cognitive Linguistics has contributed to the elucidation of these two issues. It is worth noting that by focusing on the relationship between language and cognition, Cognitive Linguistics provides a most accessible way for the investigation of conceptualization, and in turn research on conceptualization from other fields and within Cognitive Linguistics as well has benefited and will surely benefit the cognitive linguistic enterprise a lot.

5. Future Directions

Cognitive Linguistics has borrowed many terms from cognitive science, psychology, and other neighboring disciplines, but many of these terms are left unelaborated and thus give rise to considerable terminological chaos and misunderstandings, such as the terms "concept" and "conceptualization". This chapter attempts to offer a relatively systematic elaboration of these two terms. It first explained the cognitive linguistic stance on four critical issues concerning concept, i.e., its ontological status, structure, origins, and relation to language, arguing that concepts in Cognitive Linguistics are mental representations structured upon prototypes with prototypical effects arising basically from embodiment and influenced by language. Six parameters of conceptualization are put forward in this chapter including non-insularity, interactivity, dynamicity, imaginativeness, subjectivity, and embodiedness, and it then concludes that conceptualization can be investigated from both within and outside with regard to two critical issues, i.e., the psychological issue and the sociological issue, and it briefly reviewed how cognitive linguistic research has handled these two issues.

However, it is foreseeable that Cognitive Linguistics has much more to offer to the investigation of conceptualization. In the future, more efforts are expected to be made in at least the following two directions in the context of the quantitative turn and social turn in Cognitive Linguistics. The first direction is the disclosure of processing activities constituting the mental experience of conceptualization. As most attention of cognitive linguists has been directed at the phenomenology of conceptualization, much has been learned about mental experience. But the processing activities constituting the mental experience still remain mysterious, even if some research has been done on the processing of figurative languages. The area is expected to prosper in the future with the development of methodological technologies and their introduction into Cognitive Linguistics. The second direction is to investigate the sociological distribution of conceptualization in addition to its universality and variations. Although much work has been done in Cognitive Linguistics, especially in terms of universality and variations of metaphorical and metonymic conceptualization, we have merely caught a first glimpse of how conceptualization is distributed among society and there are still large areas untrodden. Wen (2019) initiated another subfield of Cognitive Linguistics, namely, Sociocognitive Linguistics, as supplementary to Cognitive Sociolinguistics proposed by Geeraerts (Marín-Arrese 2007), to which most of the current cognitive linguistic research on sociological distribution of conceptualization belongs, and stated that Sociocognitive Linguistics seeks to uncover the particular relation between language and social cognition. What role social cognition assumes

and how it is related to social cognition from a sociocognitive linguistic perspective remain to be answered.

Further Reading

Margolis & Laurence (2019). Offers a systematic literature review of philosophical perspectives on the following five issues concerning concept: (i) the ontology of concepts, (ii) the structure of concepts, (iii) empiricism and nativism about concepts, (iv) concepts and natural language, and (v) concepts and conceptual analysis.

Langacker (1999). Focuses on the relation between grammar and meaning, i.e., conceptualization, and points out the dynamicity of conceptualization in the last chapter.

Related Topics

embodiment; image schemas; categorization; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; construal; qualifying conceptualizations

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16
ICONICITY

Günter Radden

1. Historical Background

In 1965, Russian-American linguist Roman Jakobson published an article called "Quest for the essence of language", which can truly be said to mark the beginning of the study of iconicity in language. Jakobson rediscovered the "epochal significance" of philosopher Charles C. Peirce's semiotic work, which had gone unnoticed for almost 50 years. Because the main interest at that time was in formalist studies, it took almost another 20 years for the linguistic community to take note of Jakobson's pioneering work.

Jakobson recognized the far-reaching linguistic implications of Peirce's semiotic notion of the icon. Icons are signs that have qualities that 'resemble' those of the objects they represent and "excite analogous sensations in the mind" (Peirce 1931–1958: 2.229; quoted in Chandler 1994–2020). Peirce focused on two classes of icons: images and diagrams. Images represent 'simple qualities' of an object. Examples are drawings, photos, statues and, in language, words that imitate a sound, such as *baa*, *pop*, and *tick-tock*. The similarity between an image and the thing represented is not objectively given but in the eye of the observer. The drawing by the author's six-year-old grandson in Figure 16.1a represents the little boy's family. It consists of—from right to left—his father, his mother, the young artist himself, and his younger brother wearing a pointed cap, and only an observer who knows the family might be able to recognize its "qualities", the persons, their different heights, the father's beard, etc. Diagrams involve relations of signs that represent relations of a thing. In Figure 16.1b, the rising and falling curve resembles the corresponding increase and decrease in the world's population.

The third type of icon distinguished by Peirce is metaphor, which is usually not dealt with in connection with iconicity. Like iconicity, metaphor involves a relationship of resemblance, but not between a sign and an object it represents but between the object of a sign and another analogous object. In Hiraga's (1994: 15) example of metaphorical iconicity, *My love is a rose*, the metaphorical icon signifies its object ('my love') by pointing to a parallelism between the object ('my love') and something else ('a rose').

Jakobson found extensive evidence for motivation and iconicity in language and thus challenged the prevailing view of his time, de Saussure's (1916) dogma of arbitrariness. There has, of course,



Figure 16.1a Image

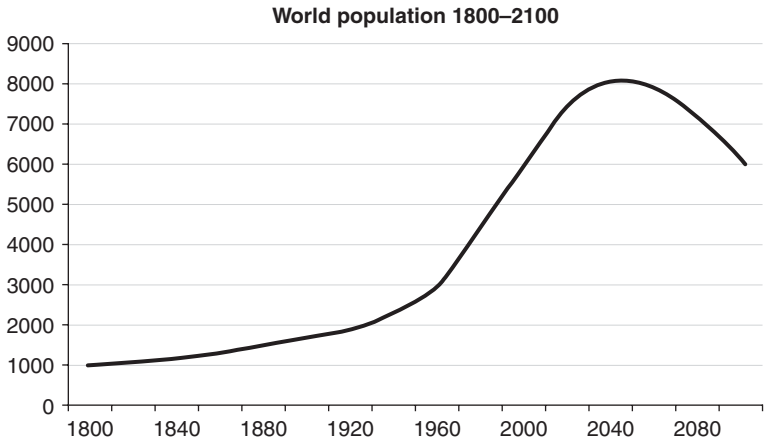


Figure 16.1b Diagram

never been any doubt about the iconic motivation of words like *meow*. *Meow* is felt to echo the sound produced by the cat, just as the word *cuckoo* is felt to echo the call of the cuckoo. Jakobson convincingly demonstrated that not just a few words are motivated but a large part of language. His best-known illustration of iconicity is a dictum attributed to Caesar, *veni, vidi, vici* 'I came, I saw, I conquered'. Here, the three verbs form a temporal diagram that mirrors the chronological order in which the events occurred.

Jakobson also pointed out that words with similar sounds are felt to convey related meanings, irrespective of their origin. For example, in de Saussure's view, the three kinship terms *father*, *mother*, and *brother* are completely arbitrary because they are morphologically indivisible. However, the three terms have in common the second syllable, *ther*, which is felt as "a kind of phonemic allusion to their semantic proximity" (Jakobson 1965: 32). Speakers of a language thus see, or may see, systemic relationships between the meanings of words cued by their shared form. Similar systemic relationships are displayed by words such as *bash*, *mash*, *smash*, *crash*, *dash*, etc., where again genetic questions are quite immaterial for synchronic analysis. However, the two sets of words differ in one important respect. The shared syllable /ðə/ in *father*, *mother*, and *brother* indicates a semantic affinity of these kinship terms, but the form /ðə/ does not relate to the meaning of 'kinship'. The phoneme cluster /æʃ/ in *bash*, *mash*, *smash*, and *crash*, by contrast, not only indicates the semantic affinity of these words but is also suggestive of their meaning. Thus, if we heard non-existing words such as *spash* or *blash*, we would intuitively assume that their meanings have to do with 'forceful

action'. We have extracted the general meaning of /æʃ/ from the many verbs of English that have similar meanings.

Phoneme clusters like /æʃ/ are known as *phonesthemes*. Words that contain phonesthemes are particularly expressive, and their meaning is even felt to somehow correspond to their sound quality. When somebody is telling us that "the burglars smashed the door", the word *smash* makes us see in our mind a scene of violent vandalism. The sound shape of the word is felt to accurately reflect the event it describes, i.e., we perceive an iconic relationship between the form of a word and its meaning.

Iconicity can be defined as referring to the perceived resemblance between aspects of the form and meaning of a sign.

2. Kinds of Iconicity

The examples of iconicity looked at can be assigned to three kinds of iconicity: imagic iconicity, diagrammatic iconicity, and associative iconicity.

Imagic iconicity, also described as imaginative and absolute iconicity, applies to a directly perceived similarity between the form and meaning of a sign or its referent. In spoken language, the form of the sign is its phonetic shape and its meaning is its acoustic image and meanings related to it. Thus, the phonetic form [mɪ'aʊ] is felt to be a close imitation of the acoustic image we have in our mind when we hear a cat meowing.

Diagrammatic iconicity applies to the perceived similarity between two kinds of relationship: a relationship between signs and a relationship between meanings or referents in conceived reality. Jakobson's (1965) example of Caesar's dictum *veni, vidi, vici* mentioned above is a perfect illustration of diagrammatic iconicity. The iconic similarity does not reside in the lexical expressions but in their relational structure. In this example, the ordered relationship of the clauses reflects the temporal sequence of events. Other diagrammatic relations pertain to the relative proximity or quantity of signs.

Associative iconicity is also a kind of relational iconicity. The words *bash*, *smash*, and *crash* are related by their final phonestheme /-æʃ/ and their similar meanings. Other words may be related by their initial phonestheme. For example, the words *glitter*, *glisten*, *gleam*, *glare*, *glimmer*, and *glow* share the onset /gl-/ and meanings related to 'light' and 'vision'. The words associated by a phonestheme form a paradigm (see sections 3.4 and 5). The paradigm of /gl-/ words also includes *glamor*, *glitz*, and *glory* and their figurative sense of 'shining' (see Bloomfield 1933; Bolinger 1950; Sadowski 2000). The more words there are that share a particular phonestheme, the stronger their semantic affinity and their iconic meaning are felt to be. In *Webster's 7th Collegiate Dictionary*, 39% of the word types and 60% of the word tokens starting with /gl-/ have meanings related to 'light' or 'vision' (Bergen 2004: 293). The phonestheme /gl/ thus very strongly evokes the meanings of 'light' and 'vision'. There is nothing, or only very little, inherently meaningful in the phonemes themselves: /-æʃ/ does not mean 'forceful action', nor does /gl-/ mean 'light' or 'vision'. The general meaning associated with a phonestheme arises from the collective meaning of the words that are linked together in a paradigm.

The three kinds of iconicity distinguished above are diagrammed in Figure 16.2. The arrows indicate iconic relationships and the dashes associative links.

The three kinds of iconicity diagrammed in Figure 16.2 are far from being clear-cut categories in language. Especially imagic and associative iconicity cannot be strictly separated because both mainly involve phonological forms. Likewise, diagrammatic and associative iconicity may be hard to keep apart because both involve relations between signs. The following discussion of the three kinds of iconicity takes instances of overlap into consideration.

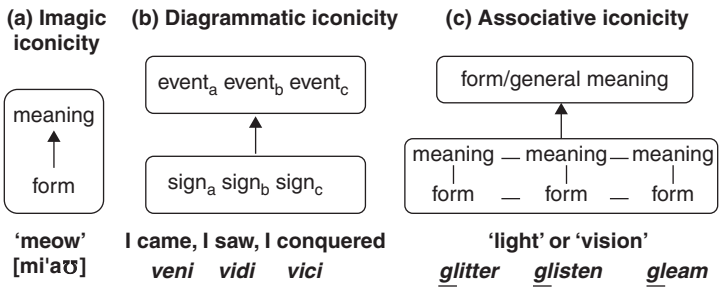


Figure 16.2 Kinds of iconicity

3. Imagic Iconicity

> Today, I realized that the word "bed" actually looks like a bed.
>
> *Fred Lavner 2016, Off the top of Fred's head*

3.1 Visual Iconicity

Imagic iconicity typically occurs in the visual mode, as in the drawing and diagram shown in Figure 16.1. As a primarily spoken medium, language is not well suited to reproduce visual information. This is one of the reasons why speech is often accompanied by gestures and facial expressions. Bolinger (1985) demonstrates how closely intonation and gesture work in parallel. For example, the *Ah!* of surprise is spoken with a high fall in pitch and paralleled by a high fall by the eyebrows, and in 'surprised realization', it also includes a down movement of the head. Bolinger also shows that a change of the gesture changes the interpretation of a sentence. He demonstrates this in gestures accompanying a nonsense sentence. Thus, when we say *Canòbis afásco* with head forward, lips pursed, and sidelong look, the string conveys defiance, but when we say it with lips smacking and a look of intense expectation, it conveys enthusiasm.

Visual iconicity is mainly exploited in *sign languages*. A large proportion of the signs used in sign languages are of iconic origin, but most of them are not transparent to non-signers. Klima and Bellugi (1979: 22) presented non-signers with basic signs of American Sign Language such as the signs for APPLE, BIRD, and BOY, and "not a single subject was able to guess the meaning of 81 of the 90 signs presented".

Writing systems present another area of visual iconicity. Most writing systems evolved from pictograms representing things like the sun, animals, humans, etc. Once these images become conventional elements of a writing system, their iconicity gives way to more opaque forms. The picture of a man with outstretched arms and feet might still be discernible in the stylized Chinese pictogram 大 for 'big', but a bull is no longer visible in the Latin character "A". Its gradual evolution from the pictorial representation of Hebrew *'lf* for 'bull, cattle' through various processes of abstraction has been retraced by Givón (1985: 193–195). The first step of abstraction involved the retention

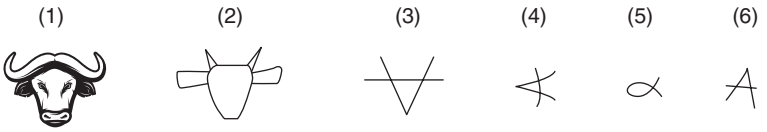


Figure 16.3 Evolution of the letter "A"
Source: Givón 1985.

of the head of the bull for the whole animal (1), the next steps included the discarding of details of the head (2) and regularization of curving lines to an abstract vertical triangle (3), followed by a sideway position of the *'alef* in the Phoenician/Hebrew writing system (4), and finally leading to the complete loss of iconicity in the Greek letter alpha *α* (5) and the Roman letter *A* (6).

3.2 Phonological Iconicity

Spoken language is ideally suited to reproducing sounds. Sounds are emitted from some source, and the strong conceptual link between a sound and the source of the sound usually allows us to identify the source. The source of a sound is normally of more interest to us than the sound itself. When we hear the noise of a sudden crash, we are worried about what happened and not about the sound. The more a sound reveals about its source, the more informative it is.

Sounds are commonly distinguished according to their vocal or non-vocal production. Some examples of words for vocal sounds (1a and b) and non-vocal sounds (1c and d) are listed below (for a more comprehensive list see Hinton, Nichols, & Ohala 1994: 10). All, or most, of these words for sounds are felt to be "sound symbolic", i.e., they evoke some aspect of meaning.

(1) a. words for animal sounds: *cuckoo*, *buzz*, *baa*, *oink*
b. words for linguistic sounds: *babble*, *murmur*, *stutter, lisp*
c. words for biological sounds: *sneeze*, *burp*, *hiccup*, *fart*
d. words for physical sounds: *crash*, *bang*, *click*, *thump*

Words for animal sounds imitate the calls made by animals and hence are characteristic of the species they belong to. Words for linguistic sounds are restricted to humans. They typically refer to a person's manner of speaking or their condition. Words for biological sounds tend to denote noises accidentally made by animates and, with humans, usually causing embarrassment. Words for physical sounds are unspecific about their source and, in a way, compensate for their lack of specificity by conveying particularly strong sound symbolism. Words for animal sounds thus appear to be the class of expressions that display the tightest degree of imagic iconicity. They will be looked at more closely.

3.3 Animal Sounds

At least experts are able to assign sounds produced by animals to their species. Does this property of animal sounds have consequences for its iconic expression? Let us consider five areas where the unique status of animal sounds is manifested.

(i) *Name for the sound and the animal*. Birds are often named after their call. We are usually more interested in the bird than in its call, but we "often first observe the singing of a bird before actually seeing the animal" (Marttila 2011: 94). Apart from the *cuckoo* and the *crow*, the titmouse called *chickadee* and the nightjar called *whippoorwill* are in English named after the birds' calls. The odd name *whippoorwill*, incidentally, reveals an interesting aspect of its naming. Its first reference in the *Oxford English Dictionary* is from 1709, in which John Lawson, an English explorer, describes the bird as "*Whippo-Will*, so nam'd, because it makes those Words exactly". The call is obviously perceived and expressed in terms of one's native language. This might explain why the bird and its call are split up into three words of English, *whip-poor-will*, even though they do not make sense. These formations reveal that people not only mimic the sounds they hear but also attempt to adapt the sounds they hear to their language.

(ii) *Language acquisition*. Imagic iconicity is prevalent in children's early vocabulary. Imitating the sound produced by an animal or a thing has the advantage that the word for the sound also

designates its source. Thus, a dog says "woof woof" and is a *woof woof*, and a duck says "quack quack" and is a *quack quack*. This also applies to objects: A train goes "choo choo" and is a *choo choo*. The reduplicated forms also reflect the iterative aspect of the call. An eye-tracking study by Laing (2017, 2019) showed that British 10- to 11-month-olds had better knowledge of iconic than non-iconic words. The children would, for instance, fixate longer on a picture of a dog after hearing "Where's the woof woof?" than after hearing "Where is the doggie?"

(iii) *Resistance to sound change*. When iconic words participate in general sound changes, they may lose their iconic quality. A dramatic sound change in English was the Great Vowel Shift. This sound change affected all long Middle English vowels. Thus, long /u:/ changed to the diphthong /aʊ/, changing the pronunciation of the word for 'house' from /hu:s/ to /haʊs/. The sound shift should also have affected the pronunciation of *cuckoo* from /'kʊku:/ to /'kʊkaʊ/ and, later on, even to /'kʌkaʊ/. *Cuckoo* resisted the sound change because its form would no longer mimic the bird's call and, possibly more importantly, it would no longer evoke its cultural associations. The repetitive call of the cuckoo is seen as a harbinger of spring, it tells children how many years they still have to live, and its call is heard every hour in the cuckoo clock. The Middle English word for 'owl', /u:le/, on the other hand, participated in the sound shift and changed to Modern English /aʊl/. The reason why *owl* was subject to the sound change probably had to do with the fact that there was a separate word for the cry of the bird, *hoot*, which in its turn resisted the sound shift from /u:/ to /aʊ/ and kept its inherited pronunciation of a long /u:/ in /hu:t/.

(iv) *Cross-linguistic commonalities*. Because animal species are the same worldwide, their cries should also be mimicked more or less identically across languages. Abbott's (2004) list of animal sounds and Marttila's (2011) study of bird names show extensive similarities between the languages as well as striking differences. For example, the sounds made by the cuckoo and the rooster are typically disyllabic with an initial velar plosive /k/, the sounds made by the cat and the cow are typically monosyllabic with an initial bilabial /m/, the sounds made by bees are perceived as voiced alveolar fricatives and written as *zzz*, and the sounds made by snakes are almost universally rendered as voiceless alveolar fricatives and written as *sss*. On the other hand, owls named after their calls are in some South American languages called *si-bi*, *márúúcu*, and *ho³ho³ka³lxi³su²*, in the North American language Purépecha *tu'kuru*, in Mende *mbu*, and in Balti *uk-pa* (Marttila 2011: 97f).

(v) *Phonological reproduction*. The words mimicking the sound of animals at best approximate their acoustic model. Rhodes (1994) describes the acoustic form of a word as *wild* and its phonological reproduction in a language as *tame*. The wild forms of animal sounds are vastly different from the tame ones. Moreover, imitations of animal sounds are formed in accordance with the phonological system of the given language. It is thus an extraordinary achievement of the speakers of different languages to find reproductions that are sometimes almost comparable. Interestingly, however, the words for animal sounds are often formed with unusual phonotactics. The phoneme patterns used in describing the following animal sounds in English do not occur in other words: /ɪ'aʊ/ in *meow*, /ʊf/ in *woof*, /ʌz/ in *buzz*, and /ɔɪŋk/ as the sound of *a pig*, etc. These sound patterns may have been deliberately chosen in order to highlight the difference of animal sounds as opposed to human sounds without breaking out of one's sound system. Phonotactic rules are, of course, also violated in other sound-imitative words, as in *vroom* /vru:m/ or *boing* /bɔɪŋ/.

3.4 Onomatopoeia

The words for sounds listed under (1) were characterized as "sound symbolic". The term *sound symbolism* is used to indicate that the sounds of a word resemble aspects of its meaning. The term is, however, misleading in that the notion of 'symbol' is usually understood as an unmotivated sign. Be

that as it may, words that are felt to be sound symbolic are known as *onomatopoeia*. An onomatopoeia is "a novel or conventionalized word in which a part of the phonological form is perceived to be similar to the referent or to a sound metonymically associated with it" (Benczes 2019: 81). This definition includes existing onomatopoeia, not just newly created words, as suggested by the meaning of the Greek word *onomatopoeia*, 'making of a name or word'. It makes it clear that only a part of the sounds of a word (metonymically) determines its iconic nature. These are normally phonesthemes. The definition also clarifies that the relationship of similarity is not objectively given but perceived, i.e., a matter of subjectivity. Finally, it takes both imagic iconicity and associative iconicity into account: "direct" similarity, i.e., imitation of a sound, and "indirect" similarity, i.e., form-meaning similarity evoked by associating a word with other words of a paradigm.

The distinction between imagic and associative onomatopoeia corresponds to Ullmann's (1972: 84) distinction between primary and secondary onomatopoeia. In primary onomatopoeia, "the sound is truly an echo of the sense". Instances of primary onomatopoeia are *buzz*, *crack*, *growl*, *hum*, *plop*, *roar*, *squeak*, *squeal*, and *whizz*. Instances of secondary onomatopoeia evoke a movement (*quiver*, *slink*, *wriggle*) or "some physical or moral quality, usually unfavorable" (*gloom*, *grumpy*, *slimy*).

Ullmann's observation of the predominant role of movement in English secondary onomatopoeia is in line with research on ideophones. Ideophones are marked words that depict vivid sensory scenes in imitative fashion (Akita & Dingemanse 2019: 1).[1] For example, Blasi et al. (2016: 1) report that in Kisi Kisi, a language spoken in Sierra Leone, *hábá* means '(human) wobbly, clumsy movement' and *hábá-hábá-hábá* '(human) prolonged, extreme wobbling'. Here, the increase of a sensory scene is conveyed by repetition. In the following example of Japanese, different kinds of motion are indicated by minimal alternation of a phoneme. Thus, *goro* denotes a heavy object rolling, *koro* a light object rolling, *guru* denotes a heavy object rotating around an axis, *kuru* a light object rotating around an axis (Imai et al. 2008: 55).

Ideophones for movement rank in frequency across languages right after ideophones for sound and before all other kinds of ideophones, as illustrated in the implicational hierarchy under (2) (Dingemanse 2012: 663).

(2) SOUND < MOVEMENT < VISUAL PATTERNS < OTHER SENSORY PERCEPTIONS < INNER FEELINGS AND COGNITIVE STATES

The implicational hierarchy is to be read as: "If a language has ideophones for movement it will also have ideophones for sounds. If a language has ideophones for visual patterns […], it will also have ideophones for movements and sounds" (Dingemanse 2012: 663).

Similar systematic relations between words are also found in English. Bolinger (1950: 130) shows that words are often interrelated by partly identical forms and similar meanings. The words listed under (3) are arranged according to their affinities with other words. The linkage of words may be based on their *onset*, often referred to as *assonance*, when they share the same initial phonemes, or on *rime* or *rhyme*, when they share the same final phonemes.

(3)

wriggle	wiggle	squiggle	jiggle				
			juggle	snuggle	struggle		
					strive	strain	

The words *wriggle*, *wiggle*, *squiggle*, and *jiggle* share the rhyme /ɪgəl/ and meanings related to 'quick, short and irregular motion'. The words *jiggle* and *juggle* share the onset /dʒ/ and the rhyme /gəl/ as well as meanings related to 'up-and-down movement'. The words *juggle*, *snuggle*, and *struggle* share the rhyme /ʌgəl/ but apparently not related meanings, whereas *struggle*, *strive*, and *strain* are again linked by the onset of /str/ and the meaning of 'forceful effort'.

The phoneme clusters in the onset and rhyme such as /ɪgəl/ are typically phonesthemes. The words *wriggle*, *wiggle*, *squiggle*, and *jiggle* are associated and form a paradigm due to their shared phonestheme and their similarity of meaning related to 'iterative motion'. The words *giggle* and *niggle* share the phoneme clusters but not the meaning of the paradigm. They would at most qualify as marginal members of this paradigm. This example shows that the notion of 'phonestheme' is far from clear-cut. It is also at odds with the traditional assumption that the smallest meaningful units in language are morphemes. As a kind of compromise, phonesthemes are described as submorphemes.

Phonesthemes are pervasive in language and have been collected and categorized extensively. However, as observed by Benczes (2019: 25), "what counts as a phonestheme is in the eye of the beholder". Understanding an onomatopoeic word and its phonestheme involves at least two mental processes. The phonestheme evokes associations to words of its paradigm, and the onomatopoeic word typically evokes a particularly rich conceptual frame. "Frames are mental structures that shape the way we see the world" (Lakoff 2004: xv). Every word evokes a frame, but the frames evoked by words that contain phonesthemes are different. Consider the following ways of expressing the same situation.

(4) a. I threw my phone away.
b. I dumped my phone.

The neutral expression *throw away* evokes no specific frame, possibly I threw my phone away because I wanted to hide it. The verb *dump* with its phonestheme /-ʌmp/ or /-ʌm/ evokes associations with unpleasant words such as *chump*, *rump*, or *dumb* and a frame of waste being disposed of, possibly I was frustrated by constant calls and dumped my phone for good so no one could reach me.

Frames are also involved in extending a paradigm of onomatopoeia. Let us consider the /sn-/ phonestheme. In the majority of the world's languages, the word for 'nose' contains the alveolar nasal /n/ (Blasi et al. 2016). This also applies to English in words such as *nose*, *nostril*, *nuzzle*, and *nozzle* (Bolinger 1940: 68). The 'nose'-frame evokes processes and actions associated with the nose and, to a certain extent, with the mouth. Verbs describing such events include *sneeze*, *sniff*, *snivel*, *snore*, *snort*, *snuff*, *snuffle*, *snicker*, and *snarl*. The phonestheme /sn-/ in these words is well motivated: Due to the nasal sound made by the nose, the /n/ relates to the nose and the /s/ to the frictional noises that arise in the nose. Actions involving the nose like blowing one's nose are considered bad manners. This negative aspect of the 'nose'-frame might have motivated the inclusion of words in the /sn-/ paradigm that have the pejorative senses of 'derision' and 'mockery' but no longer relate to the nose: *sneer*, *snippy*, *snoop*, and *snub*. Possibly words for nasty things like *snake*, *snail* and nasty actions like *snatch*, *snare*, *snide*, and *snitch* are also felt to fit in this frame and thus confirm Ullmann's observation that secondary onomatopoeia tends to evoke unfavorable qualities. The word *snob* 'arrogant person' also belongs to the paradigm of negatively loaded words. It originally referred to shoemakers, i.e., to common people, who were looked down upon by "vulgar social climbers who copied the manners of the upper classes".[2] The word *snob* then came to be used in reference to the arrogant upper classes themselves, who despised the lower folks, as witnessed in the expression *look down one's nose at someone*, which involves tilting one's head back.

The more sound-symbolic elements an onomatopoeic word contains, the more iconic it should be. The word *bang* is a prime example of a word with a high degree of sound symbolism. *Bang* is, in fact, one of the few English ideophones along with *zigzag*, *gaga*, *boing*, and *boom* (*Wikipedia* s.v. Ideophone). As such, it evokes particularly vivid imagery, is syntactically independent, and occurs after quotative *go* as in *The gun went bang*. Taylor (2004: 64–71) has examined the use of *bang* in the *bang goes* construction, as in *Bang goes the weekend*, and Marchand (1969) has dealt with the iconicity of *bang*. Both authors investigate the sound symbolism of *bang* but interpret it differently.

Marchand (1969: 318) interprets the phonemes that make up the word *bang* as reflections of sounds as they typically occur in a situation. Taylor (2004: 69f) interprets the phonemes in their association with affiliated words:

(5) a. The [æ] renders the sound the slamming of a door causes, the [ŋ] the air following it and the [b] the blunt explosive sound. (Marchand)
b. The /æ/ occurs in monosyllabic words like *slam*, *slap* and *bat* and is associated with a noisy impact and/or sudden movement, the /ŋ/ in words like *sing*, *ring* and *ping* is associated with sound or movement, and the /b/ in words like *boo*, *beat* and *bat* is associated with sudden events. (Taylor)

Both iconic interpretations of the same word are, of course, equally adequate. They show that iconicity is a matter of *perceived* resemblance and that there is no clear distinction between imagic iconicity and associative iconicity.

Onomatopoeia also represents an exciting area for acoustic studies. To the extent that a sound occurring in reality more or less accurately matches its phonological rendition in language, the degree of iconicity is objectifiable. In the demonstration of her "Analogue Building Model", Taub (2001: 24, 51–53) compares the amplitude waveforms of the sound of a bell with the spoken word *ding*. The analogue-building process involves four steps on the part of the speaker: (1) forming the concept, (2) selecting the sound image, (3) schematizing the sound image to fit the phonological categories of English, and (4) encoding. Figure 16.4 illustrates the second and the fourth steps, which are of prime interest for the iconic mapping: the auditory image of the bell's sound in (A) and the sound image encoded as *ding* /dɪŋ/ in (B).

The two amplitude waveforms are strikingly similar—they differ only with respect to their length. The phonemes of English can neatly be plotted on the sound continuum and iconically reflect three phases of the sounding of the bell. The stop /d/ marks the sharp onset of the ringing, the vowel /ɪ/ its high-pitched sound and the nasal /ŋ/ its extended muffled decay. The arrows linking diagrams (A) and (B) in Figure 16.4 indicate structure-preserving correspondences. The three

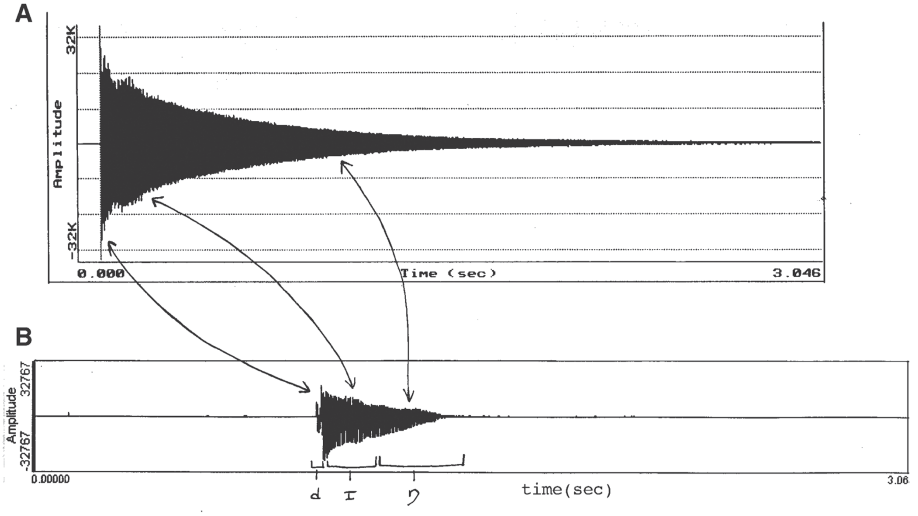


Figure 16.4 Amplitude waveforms of the sound of a bell (A) and of an American woman speaking the English word *ding* (B)

Source: Adapted from Taub 2001: 24.

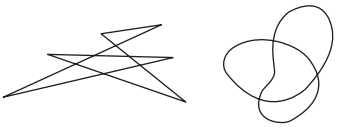


Figure 16.5 *takete* and *maluma*
Source: Köhler 1929/1947.

phonemes appear in the same order as the three phases of the sounds referred to and reflect the diagrammatic principle of linear order, which is discussed in the following section.

Recent research has also shown that language users associate phonemes with meaning. The studies were inspired by Köhler's (1929) ingenious experiments on people's perception. His subjects had to match the shapes in Figure 16.5 with the pseudo-words *takete* and *maluma* and overwhelmingly associated *takete* with the angular figure and *maluma* with the rounded figure.

Köhler's findings have been replicated many times, under different conditions and across languages, in Anglo-Saxon studies by using the pseudo-words *bouba* and *kiki*. The synaesthetic correspondences between visual and phonetic stimuli can only be explained from the sound structure of the pseudo-words. Nobile (2015) examined articulatory and acoustic features that have strong analogies with roundedness and angularity. The voiceless stops give *takete* a discontinuous acoustic profile whereas the sonorants give *maluma* a continuous acoustic profile. Many studies have discovered similar correspondences between "angular" and "rounded" phonemes (see McCormick et al. 2015).

Studies have even shown that particular sounds are matched with particular types of personality. Kawahara et al. (2015) had English and Japanese speakers judge people's personality from made-up names with angular and sonorant sound shapes, such as *sataka* and *meyana*. People with angular-shaped names were rated as blunt, confident, and unapproachable, whereas people with sonorant-shaped names were rated as modest, cute, and approachable. All these studies demonstrate that iconicity has a much wider range than thought of in its original conception.

4. Diagrammatic Iconicity

The impact of diagrammatic iconicity was recognized in work on functional grammar in the 1980s and 1990s. John Haiman (1985: 9–10) illustrated diagrammatic iconicity by using a neat analogy to the numbering of houses. The house numbered "45" lies between the houses numbered "43" and "47" in the same way that the cardinal numbers represent a quantity between 43 and 47. The Arabic numerals themselves are almost entirely symbolic. The words of a language correspond to the Arabic numerals, "but their grammar (the rule for assigning numbers to houses) is diagrammatically iconic".

Grammar is thoroughly iconic, and only a relatively small, but powerful, set of iconic principles motivates the complexity of grammar. In 1983, a memorable symposium on "Iconicity in Syntax" was held at Stanford University, where the most renowned linguists presented their work on functional and iconic linguistics. The proceedings of the conference were published by Haiman (1985) in the series *Typological Studies in Language*, reflecting its cross-linguistic approach and its use of data from 142 languages. The 14 papers collected in the volume demonstrate "that linguistic forms are frequently the way they are because, like diagrams, they resemble the conceptual structures they are used to convey" (Haiman 1985: 1). Diagrammatic iconicity has most extensively been illustrated in the following three principles of iconic coding: the principle of linear order, the principle of proximity, and the principle of quantity.

4.1 The Principle of Linear Order

De Saussure (2011 [1916]: 70) already drew attention to the linear nature of language: "[T]he whole mechanism of language depends upon it" because "auditory signifiers have at their command only the dimension of time". The principle of linear order is an iconic motivation *par excellence*. It mainly applies to the order of clauses. Givón (1991: 92) provides the following definition of this principle: "The order of clauses in coherent discourse will tend to correspond to the temporal order of the occurrence of the depicted events." We might add Haiman's (1985: 4) observation that there is no language known in which stories are regularly told 'backwards', with the narrative order being the reverse of the chronological order.

Linde and Labov (1975) have shown that people use the sequential order of narratives when asked to describe the layout of their apartment. They would take us on an imaginary tour through their apartment from the entrance to the rooms, as shown in the following excerpt (Line & Labov 1975: 926):

(6) You walk into a long, narrow foyer, leading into a smaller, squarer foyer, eating place, dinette—area. And—uh—to the right is the kitchen, and—uh—to the left, my living room.

The classic example of linear iconicity in language has already been mentioned in section 2: Caesar's famous dictum *vēnī, vīdī, vīcī* after his triumphant victory over King Pharnaces II of Pontus. Caesar did not, in fact, utter these words but sent them as a message to the Senate in Rome. As noted by de Saussure (2011 [1916]: 70), the written form represents the succession of spoken words spatially. In both modes, the linguistic order of the three verbs mirrors the temporal order of the events described.

The co-aligned order of events and clauses describing them is, as stated in Givón's principle of sequential order, only a tendency, or a default inference. Langacker (2008: 79f) provides a neat example of a divergence from the iconic order. Given the proper context, the order of events described in sentence (7a) may also be stated in the reverse order of sentence (7b), which might be given in response to the question, *What are the most important things that happened to you last year?*

(7) a. I quit my job, got married and had a baby.
b. I had a baby, got married and quit my job—in reverse order, of course.

Describing a sequence of events according to their chronological occurrence is the most natural and unequivocal way. We also have the option of marking the order explicitly. For example, the order of the two successive events described by *She kissed me goodbye and left* can be signaled by using temporal clauses, as illustrated in the four sentences below, where the numbers behind the clauses indicate the order of the events.

(8) a. She kissed me goodbye (1) *before* she left. (2)
b. *Before* she left (2) she kissed me goodbye. (1)
c. She left (2) *after* she kissed me goodbye. (1)
d. *After* she kissed me goodbye (1) she left. (2)

The order of the temporal clauses under (8a) and (8d) is in harmony with their iconic order. In the sentences under (8b) and (8c), the order of the temporal clauses conflicts with the iconic order of the events: The later event of leaving is mentioned first and the earlier event of kissing is mentioned

second. In such conflicting situations, the grammatical structure prevails over iconicity. These counter-iconic sentences are, however, harder to process. Children up to age 3–6 years consistently follow the "order-of-mention strategy" and interpret such sentences according to their iconic order (Clark 1971). Adults may have to think twice to comprehend counter-iconic sentences like the ones in (8b) and (8c). The impact of linear iconicity shows up in frequencies of use. In Diessel's (2008) study of temporal clauses, 81.8% of the sentences with initial *after*- and *before*-clauses and even 93.9% of the sentences with initial *once*- and *until*-clauses are iconic. The frequencies for sentences with final temporal clauses are less significant because adverbial clauses tend to follow the main clause, probably for reasons of information structure and processing ease.

Adverbial clauses also tend to be subject to the principle of linear order. In the sentences listed under (9), the clauses marked with a "+" sign indicate preferred choices as opposed to non-preferred choices, marked with a " – " sign.

(9) Conditional clauses
- a. + Initial: *If you apologize, I'll forgive you.*
- b. – Final: *I'll forgive you if you apologize.*

Purpose clauses
- c. + Final: *You need to register to download the game.*
- d. – Initial: *To download the game, you need to register*.

Causal clauses
- e. + Final: *I'm here because I love you.*
- f. – Initial: *Because I love you, I'm here*.

Conditional clauses tend to precede the main clause, as in (9a), because they describe the hypothetical condition, or protasis, under which a consequence, or apodosis, may occur. Diessel (2008: 470) points out that the consequence described in final conditional clauses, as in (9b), may be misinterpreted as a factual statement. Purpose clauses tend to follow the main clause because the intended event is to be realized later, as in (9c). In (9d), the purpose clause is understood as describing a condition and hence is preposed—'if you want to download the game'—whereas the main clause functions as a consequence and hence is postposed. Causal clauses are expected to precede the clause describing its effect because causes precede their effects. This iconic order applies to coordinated clauses, as in Givón's (1991: 92) example *He shot and killed her* as opposed to **He killed and shot her*. Causal subordinate clauses, however, are more likely to follow the main clause, as in (9e). Diessel (2008: 470) conjectures that the final position of causal subordinate clauses is motivated by their function of backing up a preceding statement.

Cause-effect relationships typically occur in action chains, i.e., in energetic events involving an agent and a patient. The notion of 'action chain' is understood by Langacker (1991: 292) as the flow of energy traced from an initial energy source to the ultimate energy sink. The direction of the flow of energy largely coincides with the temporal sequence of the action. The declarative active sentence *Floyd broke the glass (with a hammer)* represents a natural coding of an action chain: The initiator of the action, *Floyd*, is coded as the subject of the sentence and the entity affected by the action, *the glass*, is coded as the direct object of the verb.[3] The transitive sentence pattern S – V – O is prototypically associated with energetic actions. It is, therefore, not surprising that the majority of the world's languages prefer a word order in which the subject precedes the object.[4]

A striking use of temporal iconicity is found in Chinese. In his study of word order in Chinese, Tai (1985) observes that the position of certain sentence-internal constituents is iconically motivated. One of his examples is the following pair of sentences:

(10) a. *tā zài chúfáng-li zuòfàn*.
he PREP kitchen- in cook
'he cooked in the kitchen'
b. *tā diào zài shuǐ- li*.
he fall PREP water- in
'he fell in the water'

In sentence (10a), the place adverbial 'in the kitchen' needs to be placed before the verb because the kitchen was there before the cooking took place. In sentence (10b), the place adverbial 'in the water' needs to be placed after the verb because the person's fall happened before he landed in the water.[5]

In their seminal article fittingly called "World order", Cooper and Ross (1975) demonstrate that a wide range of fixed expressions, described as "binomial conjuncts" and "freezes", only appear in an irreversible linear order. Thus, we speak of *now and then* and *law and order*, but not of *then and now* and *order and law*. The order of such freezes is governed by semantic and phonological factors. We will look at six of the 19 semantic factors identified by Cooper and Ross. The factors listed under (11) characterize the first conjunct.

(11) a. Here: *here and there; this and that; come and go*
b. Now: *now and then; sooner or later; today or tomorrow*
c. Animate: *people and things; men and machines; horse and cart*
d. Adult: *mother and child; men, women and children; cat and kitten*
e. Male: *husband and wife; king and queen; Adam and Eve*
f. Agentive: *agent and patient; speaker and hearer; cat and mouse*

The first two semantic factors refer to the spatial and temporal deictic center typically associated with the speaker's location at the present moment. The temporal conjuncts listed in (11b) are motivated by linear iconicity: The event described by the first conjunct occurs before the event described by the second conjunct. Cooper and Ross (1975: 102) already list a large number of freezes such as *wash and wear*, *eat and run*, *hide and seek*, *park and ride*, and the list could be expanded *ad libitum* by further examples such as *Kiss and Ride*, *Coin and Call*, *Pay and Save*. The semantic factors in (11c) to (11f) reflect the stereotypical egocentric worldview of a chauvinist male, and his place in the world is characterized by the principle "Me First". The order of the pronouns in *you and I* is due to a politeness convention, but the egocentric order is reflected in expressions such as *They believe me and you to be similar* or *We and they* as opposed to the questionable order of *??They and me* (Cooper & Ross 1975: 106–107). Panther (this volume) has shown that the iconic order *men, women and children* in (11d) reflects the patriarchic sociocultural model and is by far the most frequent order among the six possibilities of ordering the three nouns.

The first conjunct of a freeze normally contains less phonological material than the second conjunct. For example, in (11a), *come* has a short vowel and a closed syllable, whereas *go* has a long vowel and an open syllable. Here, the semantic and phonological factors jointly determine the ordering of the freeze, but they may also be in conflict. For example, the order of *now and then* in (11b) conforms to the order of events but conflicts with the phonological constraint. *Then* with its short vowel and closed syllable should come first and *now* with its diphthong and open syllable second. Here, semantics overrides phonology. Phonology may also override semantics. Cooper and Ross (1975: 73) give as an example the expression *trick or treat*, said by children when they ask for sweets on Halloween. *Trick* has a short vowel and is mentioned first, whereas *treat* has a long vowel and is mentioned second. According to semantics, *treat* should be mentioned before *trick* because what the children mean is, 'If you don't give us a *treat*, we will play a *trick* on you'.[6]

The semantic and phonological factors determining the irreversibility of freezes are based on principles of processing load. Material that is easier to process tends to be placed before material that is more difficult to process (Cooper & Klouda 1995). The material described in the first conjunct is immediately available to the speaker: his location *here*, his present time *now*, his view of the world as 'me first'. The material described in the second conjunct extends beyond the speaker's egocentric experience: It includes a place over there, a time in the past or the future, and other people or things like children, machines, or mice. The material in the first conjunct is familiar to the speaker and needs less phonological material than the second conjunct, which needs more phonological material.

The linear order of linguistic units may also be determined by other than temporal factors. As shown by Posner (1986), the order of adjectives in attribute-noun constructions relative to their head noun is determined by their semantic properties. Adjectives denoting essential properties are closer to the noun than adjectives denoting accidental properties. The natural order of attributive adjectives is illustrated in sentence (12a).

(12) a. a beautiful young Japanese woman
b. ?a Japanese young beautiful woman

The adjective *Japanese* is adjacent to the noun because one's nationality is a permanent property, *young* is farther removed from the noun because one's age changes over time, and *beautiful* is farthest away from the noun because the property it describes is based on the speaker's personal assessment. The reversal of the natural order of attributes in (12b) sounds odd.

4.2 The Principle of Proximity

Givón (1991: 89) defines the diagrammatic principle of proximity or distance in its widest sense: "Entities that are closer together functionally, conceptually or cognitively will be placed together at the code level, i.e., temporally or spatially".[7] He relates the notion of 'proximity' to "general requirements of associative memory, spreading activation and priming", which are beyond the scope of the present survey. However, support for viewing proximity as a general cognitive disposition is found in visual perception. The Gestalt law of proximity states that "things that are close together appear to be more related than things that are spaced farther apart".[8] Thus, in Figure 16.6, the patches and dots that are in proximity to each other are seen as being related and forming groups. In Figure 16.6a, we see, not six patches, but twice three patches, and in Figure 16.6b, we do not see 42 dots, but two dotted circles (Metzger [1936] 2006: 30; from Köhler 1933).

It is to be expected that our brain processes close and distant linguistic units in the same way as close and distant visual figures. Linguistic areas in which the principle of proximity has been shown to operate include lexical fusion and a host of grammatical phenomena.

Lexical fusion. Lexical fusion represents the tightest degree of proximity. It is, for example, found in blends, such as *pictionary* or *Brexit*, where two words or parts of words are combined to form a new word. In the late 1960s, generative semanticists also treated simple lexical items as fusions of "atomic" elements of meaning. The lexical item that was extensively discussed at that



Figure 16.6 Gestalt law of proximity

time was the verb *kill*. The causative verb *kill* comprises the atomic predicates 'cause', 'begin', and 'resulting state' and hence was claimed to derive from *cause to die* or *cause to become dead*. However, these expressions are not synonymous. The lexical verb *kill* refers to a single event and the periphrastic construction *cause to die* to two events (Wierzbicka 1975; Haiman 1985: 108–111). This compares to our perception of things: Things that are close to each other are seen as related and things that are far apart as unrelated. In the verb *kill*, its constituent elements CAUSE and EFFECT are related and even fused, whereas in the periphrastic construction *cause to die*, these elements are unrelated and kept apart. As a result, *kill* denotes direct causation and physical contact and *cause to die* indirect causation and absence of physical contact. *Cause to die* or *bring about to die* can, therefore, be used to describe a complex situation in which the causal event happened at one point in time and its effect happened at a later point in time. This would not be permissible with the simple verb *kill*, as illustrated in the following pair of sentences adopted from Lakoff (1977: 245):

(13) a. On Friday I brought it about that John would die on Saturday.
b. *On Friday I killed John on Saturday.

The same difference between direct and indirect causation obtains in pairs such as *show* versus *make someone see* and *remind* versus *make someone remember*. Most periphrastic expressions, however, do not have a simple lexical counterpart. For example, English has no causative verbs corresponding to *make someone hear*, *feel*, *like*, etc. The reason why such verbs do not exist is that we cannot, as a rule, bring about these effects directly, but only indirectly.

Complementation. Distance is a matter of more or less, and some constructions can, therefore, also be arranged along a scale. The sentences under (14) have been adopted from a "binding scale" of degrees of complementation elaborated by Givón (1991: 95). The underlined words increase the distance between the matrix and complement clauses: the greater the distance between the clauses, the smaller the effect of the main event on the subordinate event.

(14) Degrees of complementation
a. Bare infinitive: *She made him leave.*
b. *to*-infinitive: *She told him <u>to</u> leave.*
c. Subjunctive: *She wished <u>that he would</u> leave.*

Transitive motion. Similar effects have been noted by Panther (in print) in transitive motion constructions. In the sentences below, the verb of the main clause, *order*, compels a person to move out of the car. The expectation that the driver complies correlates with the distance between the causative verb and the effect.

(15) Transitive motion construction
a. strong implicature: *The detectives ordered him out of the car.*
b. weak implicature: *The detectives ordered him <u>to step</u> out of the car.*

Sentence (15a) codes this complex situation as a single event and invites the strong implicature that the event occurred. Sentence (15b), on the other hand, codes the situation as two events with the infinitive *to step* separating cause and effect. As a result, this construal only weakly implies that the event actually took place.

Transitivity. The conceptual and linguistic proximity is particularly strong between a transitive verb and its direct object. Consider the sentence pair below.

(16) Direct object—Prepositional adjunct
a. + Effective: *Felix slapped a mosquito.*
b. – Effective: *Felix slapped <u>at</u> a mosquito*.

In sentence (16a), the action described by the verb immediately affects the thing described by the direct object. The sentence is, therefore, interpreted to mean that Felix killed the mosquito. In sentence (16b), the object is separated from the verb by the preposition *at* and hence is not affected by the action. The sentence is, therefore, understood to mean that the slap missed the mosquito. Likewise, in *Felix kicked the door*, the direct object is affected by the transitive action of kicking: The door might fly open, fall shut, or break. In *Felix kicked at the door*, Felix might have used force but the door did not open or shut or break. Therefore, we couldn't say, **Felix kicked at the door open*.

"Dative shift". The following pair of sentences differs from the preceding one in that they involve a dative, or indirect object. The two constructions under (17) are usually seen as closely related and referred to as "dative shift" or "dative movement".

(17) Indirect object—Prepositional adjunct
a. + Effective: *Heidi wrote her mother a letter.*
b. – Effective: *Heidi wrote a letter <u>to</u> her mother.*

In sentence (17a), the indirect object is adjacent to the verb and is, like the direct object, affected by the action of writing. The sentence is, therefore, interpreted to mean that Heidi's mother probably received the letter. In sentence (17b), the prepositional object is separated from the verb and not affected by the action. The preposition *to* normally marks the goal of a motion and the sentence is, therefore, understood to mean that Heidi finished writing the letter, but we do not know if she sent it or if her mother received it. Similar contrasts have been observed between *I taught Harry Greek*, meaning that Harry actually learned Greek, versus *I taught Greek to Harry*, meaning that the teaching took place, but nothing is said about whether any learning took place (Lakoff & Johnson 1980: 130; Thompson & Koide 1987).

Possession. The following pair of sentences illustrates differences in the linguistic behavior of so-called inalienable possession ('cannot be given up') and alienable possession ('can be given up'). Inalienable "possession" refers to body parts or relatives, alienable possession refers to things we own. The distinction between these two kinds of possession is understandably so fundamental that it is often marked in languages. For example, inalienable possession would be expressed by using an affix and alienable possessions by using a separate noun, which thus reflects their different conceptual distances (Fox 1981; Haiman 1983: 791–795). The sentences under (18) show that the two kinds of possession are also distinguished in English in a very subtle way.

(18) Possession

a.	Inalienable:	(i) *I kissed her lips.*	(ii) *I kissed her <u>on</u> the lips.*
b.	Alienable:	(i) *I kissed her shoes.*	(ii) *?I kissed her <u>on</u> the shoes*.

Inalienable possession, as in (18a), allows two ways of expression: (i) either by naming the possessed body part, or (ii) by naming the person *and* the body part. In sentence (i), the possessor is coded as a possessive pronoun in *her lips*, in sentence (ii), the possessor is "ascended" to the position of a direct object—and hence affected by the verb's action, whereas the body part is downgraded to a prepositional adjunct, *on the lips*. Alienable possession, as in (18b), only allows naming the possessed thing, her shoes. If the possessor is named as a direct object, as in (ii), we

can only interpret the sentence in the sense of inalienable possession. Now the possessed thing, the shoes, is understood as an extension of a person's body part. In construction (ii) with the "ascended possessor" as a direct object, the possession, i.e., the lips and the shoes, is separated from the action described by the verb, but this is done for good iconic reasons: Now the person who is really affected by the kissing is put next to the verb.

Clausal coherence. Caesar's dictum *veni, vidi, vici*, which was already quoted as an illustration of sequential order, may also serve as an instance of iconic proximity. The three clauses are asyndetically juxtaposed and thus compressed into a single event. The tight connection of the clauses mirrors the swiftness of Caesar's military actions leading to victory (Nänny & Fischer 1999: 3).

Inter-clausal coherence. As indicated in the examples under (12), attributive adjectives are commonly juxtaposed. Predicative adjectives, by contrast, are usually coordinated with *and*, as in (19b).

(19) Attributive adjectives—Predicative adjectives

a.		Attributive juxtaposition:	*a beautiful young girl*
b.	+	Predicative coordination:	*The girl is young and beautiful.*
c.	–	Predicative juxtaposition:	**The girl is young, beautiful.*

The first thing to note is that the predicative adjectives in (19b) appear in the reverse order from that of attributive adjectives in (19a). This order makes perfect iconic sense: The adjective that denotes a permanent property, *young*, is still in closer proximity to the noun than the adjective *beautiful*, which only denotes an accidental property. The linking of the adjectives also makes sense: Attributive adjectives jointly spell out properties of the thing described by a noun, whereas predicative adjectives each assign new properties to the thing denoted by a noun and hence are coded separately.[9]

Political correctness. Proponents of political correctness demand that expressions that are felt to be offensive to particular groups of society should be replaced by politically acceptable expressions. Some typical examples of offensive expressions that should be avoided and replaced by politically correct expressions are listed under (20).

(20)

	Offensive expressions	Politically correct expressions
a.	*colored person*	*person of color*
b.	*dyslexic student*	*student with dyslexia*
c.	*cripple*	*person with a physical disability*
d.	*blind person*	*person with visual impairment/ who has low vision*
e.	*slow learner*	*person with a learning or cognitive disability*

The most conspicuous difference between the two sets of expressions is their different lengths. This may relate to the iconic principle of quantity that is discussed below, but an iconic factor that is certainly also involved is proximity. In the set of politically correct expressions, the noun and the adjunct are separated by a preposition, i.e., the persons are separated from their impairment or other stigma. Moreover, the properties in the two sets differ. Most of the offensive expressions contain premodifier adjectives, which, in English, tend to designate permanent and general properties, as in *a reviewed article* (for attributive and predicative modification see Bolinger 1967 and Radden and Dirven 2007: ch. 7). The politically correct expressions, on the other hand, contain postmodifier phrases, which tend to designate changeable and particular properties, as in *an article reviewed*. The attenuating effect associated with the politically correct expressions is thus triggered by the postposition of the modifier phrase and its separation from the noun denoting the person by a preposition. The greater length of the positive politeness expressions is due to the fact that there is no

better way of expressing their normality. The phrase *a person with a physical disability* sounds as unremarkable as *a person with a gleeful smile*.

4.3 The Principle of Quantity

> Would you say that again using more words?
>
> *Jim McCawley*

The principle of quantity applies to language-internal as well as language-external iconic relationships. In language-internal iconicity, MORE MEANING IS MORE SOUND. For example, the drawn-out vowel in *That was a looooong story* emphasizes the long duration of the story. In language-external iconicity, MORE SOCIAL DISTANCE AND RESPECT IS MORE SOUND. For example, in the British House of Commons, Members of Parliament are addressed as "The Honourable Member" and, when the MP is also a member of the Privy Council, as "The *Right* Honourable Member".

4.3.1 The Principle of Quantity in Language-Internal Iconicity

Givón (1991: 87) finds "footprints of this principle" in the following areas.

(i) A larger chunk of information will be given a larger chunk of code. For example, derived lexical words contain more coding material than un-derived ones. Thus, *active* is longer than *act*.
(ii) Less predictable and more important information will be given more coding material. For example, contrastive elements receive prominent stress, as in *I saw **Bill** leave, not Harry*. Conversely, pieces of identical information are given less coding material—one need not say what is already known (Haiman 1983: 802). Thus, in *Mary wanted [Ø] to leave*, the co-referential subject of the complement clause, *Mary*, is deleted.

The most straightforward application of the quantity principle relates to the sound and meaning of words. A word that contains more sound is felt to convey more meaning. For example, people think of a vase pronounced as [va:z] as bigger than a vase pronounced as [veɪz]. Bolinger (1980: 19) notes differences in meaning conveyed by different past tense forms. Thus, the pronunciation *dreamed* suggests "slowly moving action" and that of *dreamt* "completed action". Similar differences apply to *spilled* vs. *spilt*, *burned* vs. *burnt*, and *smelled* vs. *smelt*.

The language-internal principle of quantity mainly operates in morphology and syntax. Some illustrative examples are given below.

Gradation. One of Jakobson's (1965: 29) examples of iconicity was adjective gradation in the Indo-European languages. The forms for the positive, comparative, and superlative degrees contain an increasing number of phonemes, as in English *high–higher–highest* or Latin *altus–alterior–altissimus*. In Jakobson's words, "the signatia reflect the gradation gamut of the signata", which, in Givón's words, translates as a larger chunk of code reflects a larger chunk of information. Jakobson's analysis has been criticized on the grounds that the size described by adjectives such as *small–smaller–smallest* decreases rather than increases. It is, however, not the semantics of the adjectives that matters in gradation but the schematic augmentation of their conceptual scope. The positive invokes one referent, the comparative two referents, and the superlative at least three referents. The gradation of adjectives can be compared to the increasing temporal distances from the present moment to the future and to the past. Thus, certain relatives of ascending and descending generations are in English formed in the same symmetrical way: *grandparents* and *grandchildren*, *great-grandfather* and *great-grandson*, etc.

Plurality. Jakobson (1965: 30) also lists the increased length of plural forms as echoing "the meanings of a numeral increment". This applies to the majority of plural forms but not, for example, to Latin neuter nouns in *–um*: The singular form *oppidum* 'town' has more phonemes than the plural form *oppida* 'towns'. A number of English words of foreign origin have kept the shorter foreign plural ending. The preferred plural form of *curriculum* is *curricula*, not *?curriculums*. The same applies to the short plural forms *bacteria*, *phenomena*, *alumni*, and *stimuli*. Here, the learned ring of academic terms wins out over the iconic principle. At the same time, there is a tendency to avoid such non-systematic plural forms. The most economical way is to use the originally shorter plural form for both the singular and the plural, as in *data* and *media*.

Reduplication. The notion of reduplication is mainly understood as a morphological process. The repetition of the root syllable of a word is, in fact, optimally suited to denote an increase of quantity. Reduplication is widely attested across languages and with all kinds of functions. Its predominant functions are illustrated under (21).

(21)	a.	Plurality:	Japanese *ie* 'house', *ieie* 'houses'
	b.	Collectivity:	Indonesian *orang* 'man', *orang orang* 'people'
	c.	Iteration:	Fiji *kai* 'call', *kaikai* 'call repeatedly'
	d.	Intensification:	Samoan *taaba* 'speak', *taaba taaba* 'scream'
	e.	Duration:	Vietnamese nói 'talk', nóinói 'keep talking'
	f.	Diminution:	Sahaptin kušú 'pig', kusúkusu 'new-born pig'
			Nepali sānā sānā bastu 'very small things'
			Guugu Yimidhirr *gunggaarr* 'north',
			gungga=gunggaarr 'a bit north' (smallish distance)

The examples of diminution, taken from Aoki (1994: 19), Pharies (1985: 50), and Haviland (1998: 9), respectively, demonstrate that reduplication does not necessarily correlate with an increase in semantic information. Like adjective gradation, the augmentation of reduplication applies schematically and may go in either direction. As remarked by Haspelmath (2008: 5), reduplication is also marked with respect to frequency in that the reduplicated form is always the rarer one.

Reduplication may also be achieved by repeating words. We may string together nouns (*There's forms forms forms forms*) or verbs (*She talks talks talks talks*), or coordinate verbs (*The ball bounced and bounced and bounced*), or verb phrases (*He told me and told me and told me*). Due to the independent status of words, their reduplication is subject to the principle of sequential order, and the iteration of a few units stands for the whole sequence. The experiential basicness of this kind of repetition has been pointed out by Bolinger (1980: 43): "*He kept telling me* is shorthand for *He told me and told me and told me and …*"

Contraction. Givón (1991: 88) compares the full lexical form *have* in *I have two books* to the contracted grammatical form *'ve* in *I've read two books*. The full form *have* is used as a lexical verb meaning 'own' and thus contains more information than the contracted form *'ve*, which is used as a perfect marker and cannot be used in the sense of 'own'.

Brown and Levinson (1978: 271) argue that contracted forms have a different communicative function than their corresponding conventional forms. Three of their examples comparing full and contracted forms are listed below:

(22)		Negatively polite forms	Positively polite contracted forms
	a.	*I want to*	*I wanna*
	b.	*Do you want to*	*Wanna*
	c.	*Do you need a*	*Needa*

Negative politeness is understood as "the desire to be unimpeded in one's actions"; positive politeness is understood as "the desire (in some respect) to be approved of" (Brown & Levinson 1978: 13). Contracted forms in positive politeness are markers of in-group membership and casual informality. Rather than invoking larger and smaller chunks of information, the different forms thus characterize different registers used according to social distance. The difference in quantity between these forms thus relates to language-external iconicity.

4.3.2 The Principle of Quantity in Language-External Iconicity

The correlation between language-external factors and expressions of quantity is particularly conspicuous in offensive, derogatory, and other emotionally charged expressions. Taboo words like *shit* and *fuck* are vulgar and inappropriate in public but may be fully acceptable in locker room talk. Expressions such as *defecate* and *fornicate*, on the other hand, are appropriate in a doctor's office but inappropriate in the locker room. Haiman (1983: 802) argues that the length of a word is an index of one's familiarity with the word and an expression of social distance. Short words including four-letter words relate to familiar semantic domains and signal close social distance. Long expressions including euphemisms, on the other hand, relate to less familiar domains and signal respectful social distance. Metaphorically speaking, in using euphemism, the speaker wraps up the unpleasant content of a message in protective verbiage (Haiman 1983: 801).

People are aware of the appropriateness of a word, but "[w]hat seems 'appropriate' to speakers may often be what is iconically motivated" (Haiman 1983: 800). Expressions are felt to be appropriate when their length, or the distance between words, corresponds to "some other distance", in particular to social distance and related aspects, such as formality and politeness.[10] The following mundane example of requests illustrates increasing degrees of linguistic quantity reflecting increasing degrees of social distance.

(23) a. Come here!
b. Please come here!
c. Can you come here?
d. Could you please come here?
e. Would you mind if I asked you to come here?

The short direct request in (23a) might be used in talking to a little child or a dog, the slightly longer request in (23b) could be used in talking to a bigger child or to one's friend. Both reflect a close social distance to the addressee and would sound rude if said to an acquaintance. Indirect requests are longer and have an open intonation contour allowing the hearer to opt out. The requests in (23c) and (23d) are polite forms used with people of neutral social standing. The longest indirect request in (23e) would be used in asking a respectful person for a favor.

The quantity of an expression is noticeable when it competes with alternatives. This applies to the well-known difference in register between words of Germanic and Latin origin, such as *buy* vs. *purchase*; *talk* vs. *converse*; *think* vs. *reflect*; *guess* vs. *conjecture*, etc. Words of Latin origin are invariably longer than inherited words of Germanic origin. Innumerable critics have noted and ridiculed the pretentious diction and pseudo-academic jargon in present-day writing, such as the use of *perform an analysis* for *analyze*. One of the earliest critics of this kind of inflated style was Orwell (1946), who said that "It is easier—even quicker, once you have the habit—to say *In my opinion it is not an unjustifiable assumption that* than to say *I think*" (Orwell 1946: 149).

According to the language-internal principle of quantity, a larger quantity of form is expected to reflect a larger quantity of information. The use of excessive wording in pretentious diction, however, is not licensed by factors of social distance, such as respect, formality, or subject matter. It is

thus in conflict with the language-external principle of quantity. The conflict between the language-internal and language-external principles of quantity is resolved by interpreting such utterances in other than literal ways: as deliberate exaggeration or boasting, as self-deprecating or humble behavior, or as an attempt not to personally commit to a statement. The iconic principles of quantity thus explain implicatures arising from violating the maxim of quantity (Grice 1975; Brown & Levinson 1978: 219–220).

5. Associative Iconicity

Words of a feather flock together.

The proverbial expression *Birds of a feather flock together* embodies the folk view that similar things are attracted to each other. This view is also reflected in language. Languages that express notions of similarity in terms of space overwhelmingly use a Goal marker like the preposition *to* in *similar to*. Similar things metaphorically move to each other. Conversely, notions of difference tend to be coded by a Source marker, as in *different from*. Different things metaphorically move away from each other (Radden & Matthis 2002). Likewise, similar linguistic signs are attracted to, and associated with, each other and different signs are repelled and dissociated from each other.

In sections 3.2 and 3.4, we looked at instances of associative iconicity in which onomatopoeic words were associated with similar words and formed a paradigm. The essence of the paradigm was distilled from the form and meanings of the associated signs and could often be schematically captured in the form of phonesthemes and the frame they evoke. This iconic process of *paradigmatic association* can be represented as involving the following steps.

(24) Paradigmatic association

(i)	A sign is given:	*crash*
(ii)	The sign is associated with similar signs:	*crack*, *crush*, *crunch*
(iii)	The signs form a paradigm:	*/kr-/* ‘destructive sound’

An associative process can also be prompted by two or more signs of a given string of signs that do not, or do not necessarily, belong to the same frame. These signs are typically words that are linked by alliteration, assonance, or rhyme. An example of this kind of association is the phrase *neither rhyme nor reason*, which was popularized by Shakespeare.[11] Due to their alliteration, *rhyme* and *reason* attract each other and prompt us to find a common frame that does justice to both concepts. A likely interpretation of *neither rhyme nor reason* would be that something makes absolutely no sense, neither from a poetic or intuitive point of view nor from a logical point of view.[12] The iconic process will be described as ‘*prompted association*’ and is represented in the following three steps.

(25) Prompted association

(i)	A string of signs is given:	*neither rhyme nor reason*
(ii)	The signs share part of their form:	/r-/ and final nasal
(iii)	The signs evoke a composite meaning:	‘no sense at all’

The power of prompted associations has been illustrated by Jakobson (1960: 357) in the following delightful dialogue.

(26) A girl used to talk about “the horrible Harry.” “Why horrible?” “Because I hate him.” “But why not *dreadful*, *terrible*, *frightful*, *disgusting*?” “I don’t know why, but horrible fits him better.” Without realizing it, she clung to the poetic device of paronomasia.

We enjoy paronomasia, a play upon words that sound alike, because their connection prompts us to associate concepts that are normally not related. In *horrible Harry*, the alliterating consonants /h/ and/r/ attract the two words to each other so that, due to the proximity principle, we see the attribute 'horrible' as a permanent and characteristic property of Harry. Connecting *dreadful* or *terrible* with *Harry* does not have the same effect, but matching *dreadful* with *Dan* or *terrible* with *Tom* would prompt the same unpleasant associations.

Associations evoked by alliteration, assonance, and rhyme are omnipresent in daily life. The following lines illustrate alliteration and rhyme in nursery rhymes in (27a and b), advertisements in (27c and d), political slogans in (27e and f), and other slogans in (27g and h).

(27)	Alliterations	Rhymes
a.	*Mary had a* ***l****ittle* ***l****amb.*	b. *Ee****ny****, m****ee****ny*, *m****i****ny*, *m****o****e*
c.	***My G****oodn****ess****, my G****uinn****ess***	d. *L****oan*** *by ph****one***
e.	***b****uild a* ***b****ig,* ***b****eautiful wall*	f. *No* ***Deal*** *is* ***Ideal****.*
g.	***F****riday for* ***F****uture*	h. *R****andy Andy***

Children love the harmony of words in nursery and counting rhymes. In (27a) and (27b), alliteration, assonance, and rhyme and the lateral and nasal consonants jointly contribute to the melodiousness of the verses. Advertisements arouse interest through unexpected connections. The catchy slogan of Guinness beer in (27c) was created in 1936, and its long attraction is certainly due to its abundance of assonance and rhyme. The alliteration in Trump's election promise in (27e) makes it almost sound poetic—its full wording includes one more alliteration, … *along the US* ***b****order to Mexico*. Boris Johnson's eye rhyme in (27f) refers to a hard Brexit, and the mocking nickname given to Prince Andrew in (27h) blatantly points to his sexual escapades.

In all these examples, we appreciate the witty and aesthetic adornment given to trivial statements, in fact, we cannot avoid noticing alliteration, assonance, and rhyme. Because prompted associations involve a relationship between two or more signs, they are a kind of diagrammatic iconicity. It is, therefore, not surprising that prompted associations can be superimposed on diagrammatic iconicity. This is, once again, best illustrated in Caesar's dictum. Jakobson (1960: 358) notes that the three disyllabic verbs *veni, vidi* and *vici* are symmetric in their identical initial consonant and identical final vowel, which "added splendor to the laconic victory message". Müller (2000: 305–307) draws attention to the increase in assonance of the two final clauses *vidi* and *vici*, which signal the growing momentum of the events, and to the use of the first-person-singular verb forms, which reflect the speaker's view of reality rather than objective reality and imply "the personal triumph of the speaker".

The range of possible interpretations of Caesar's dictum appears to be infinite. Yet our interpretations are still guided by iconicity: We are searching for meanings evoked by a form. Hence we are also still in the realm of iconicity when we come across humorous word plays like the ones below.

(28) a. Veni, vidi, amavi (I came, I saw, I loved)
b. Veni, vidi, edi (I came, I saw, I ate)
c. I came, I saw, I forgot what I was doing.

There are many further variations of Jakobson's classical triplet, e.g., in the advertisements for a car, *Eye it, Try it, Buy it*, or for the resale of luxury goods, *Buy It, Sell It, Make Money*. All of these formations are iconic. Like their classical model, they involve sequential order and connected association. Hence, they would make perfect sense to a person who had never heard of Caesar's dictum, but this person would miss the crucial point of these slogans—they would not sound funny. Once we are familiar with the dictum, we understand the sentences under (28) as what they were meant to be: humorous absurdities.

6. Iconicity, Arbitrariness, and Systematicity

Iconicity is usually seen in opposition to arbitrariness. Iconicity represents motivation in language *par excellence*, whereas arbitrariness represents lack of motivation. The benefit of iconicity has been characterized by Givón (1985: 189) in an often-quoted meta-principle of iconicity: "All other things being equal, a coded experience is easier to store, retrieve and communicate if the code is maximally isomorphic to the experience". All three advantages of iconicity apply to the acquisition of child language and pidgin languages, and the communicative aspect also applies to ideophones, i.e., words that evoke vivid sensory depictions.

These beneficial properties of iconicity appear to be at odds with the fact that languages always develop in the direction of arbitrariness. Thus, words like *laugh*, *sob*, and *spank* were originally iconic. The verb *laugh*, for instance, originated as an interjection representing laughter, *ha ha*, a trace of which is still visible in the Old English form *hlæhhan*. The iconic origin of these verbs is for most speakers no longer transparent—the words have become arbitrary. Akita and Dingemanse (2019: 5) have observed similar processes of "deideophonization" in Japanese. Thus, the verb *hikaru* 'shine' derives from the ideophone *pikapika* 'shine brightly'. Owing to their different forms—initial /p/ only occurs in ideophones—Japanese speakers no longer associate *hikaru* with *pikapika*.

Not just spoken language, but also writing systems gradually move away from their iconic pictograms (section 3.1), as do sign languages from their iconic gestures. With advancing age, children also switch over to arbitrary words—recapitulating the phylogenesis of language development. Why should iconicity be widespread in the initial stage of language development and fall behind in favor of arbitrariness in later stages?

Numerous studies have dealt with the role of iconicity in language acquisition. Three such studies will briefly be mentioned: a study of onomatopoeic words, a study of sound symbolism, and a study of phonesthemes.

Empirical research has shown that children's earliest-learned words are onomatopoeic words. Laing (2014) examines the acquisition of onomatopoeic words (OW) in relation to the corresponding conventional words (CW) in more detail. During the months between 0-8 and 0-11, Annalena, a German girl, built up a vocabulary of predominantly onomatopoeic words. By 0-11, she increasingly replaced OWs by CWs and, by 1-6, stopped acquiring new OWs altogether. The transitional phase between 1-0 and 1-3 turned out to be particularly revealing. Annalena had already acquired an inventory of consonants in onomatopoeic words but they did not fully match the inventory of CWs. The phonological challenges she faced are illustrated in her pronunciation of *Katze* 'cat', /katsə/. At 1-2, she pronounced the word as [aka], at 1-3 as [taðːə] and [taxːa], and at 1-4 as [daksə] and [kaça]. Annalena already had [k] in her inventory of OWs, but apparently not in initial position, so that she dropped it or replaced it by other consonants. She also replaced the unfamiliar affricate /ts/, first by using the familiar sound [k], then by using fricatives, and finally by using a velar affricate. She also applied the familiar OW pattern of vowel harmony in [aka] and [taxːa] instead of using the final schwa. Laing interprets these forms as intermediate steps in the transition from phonetics to phonology. Onomatopoeic words provide a phonetic and lexical template from which phonological structures and conventional words could be implemented—they serve "as a bootstrapping mechanism for word learning" (Laing 2014: 40).

The notion of bootstrapping has also been applied to sound symbolism by Imai and Kita (2014). Studies of Japanese children have shown that 11-month-old infants are already sensitive to Köhler's shape sound symbolism (Asano et al., cited by Imai and Kita 2014: 6; for Köhler see Figure 16.5). The children were able to match novel words like *kipi* and *moma* to pictures of spiky and rounded shapes, and this biologically endowed ability may also help them to associate speech sounds with meaning. In this way, sound symbolism scaffolds word learning from infancy to early childhood.

A study by Bergen (2004) demonstrates that phonesthemes have psychological reality. His preschool subjects responded to words such as *glitter* and *glow* much faster than to semantically

unrelated words such as *druid* and *drip*, which shows children's awareness of word affinities. They also responded to frequent words much faster than to infrequent words, such as *crony* and *crook*, which shows that the children make use of statistical information in processing form-meaning pairings. The children must have internalized the statistical sound-meaning correlation in the same way that language users have internalized the statistical correlation between a person's gender and the phonology of their name. Male names like *Richard* and *Arthur* tend to have initial stress and end in consonants, female names like *Irene* and *Michelle* tend to have word-final stress and end in vowels (Cassidy et al. 1999). In both situations, the language user subconsciously picks up on such subtle statistical tendencies and uses them in iconic mappings.

A crucial issue is whether, or to what extent, children perform iconic mappings. As previously mentioned, iconicity is in the eye of the beholder (Occhino et al. 2017). This means that iconicity is not an objective relationship between image and referent but a relationship between our mental models of an image and a referent (Taub 2001: 19). Does the cognitive basis of iconicity also apply to children's use of language? Does a child "see" an iconic link between the sound and meaning of iconic words like *slurp*? Are responses given by a child to her caregiver to be seen as iconic, as in the following dialogue? Mother: "You're a chicken. Buck buck buck …"—Child (Naima 1-5): "Buck buck [bæp bæp]" (Laing 2019: 181). Here, the child apparently parrots an onomatopoeic word as best she can and does not yet interpret it iconically.

Studies by Lev Vygotsky and Jean Piaget have shown that children's conceptual world is dramatically different from that of adults. Thus, the name of an object is understood as an integral part of the object. When preschool children are asked why a cow is called *cow*, they say things like, "A cow is called *cow* because it has horns" (Vygotsky 1987: 254). Chandler (2007: 74) concludes that, "for the child, words do not seem at all arbitrary". Could words be iconic to the child?

The reassessment of iconicity as a fundamental property of language has also led to a reassessment of arbitrariness. In their model of motivated vocabulary structure, Dingemanse et al. (2015) propose three types of form-meaning correspondences, each of which is characterized by its advantages. *Arbitrariness* has advantages such as flexibility, being able to communicate abstract concepts, distinguishing type and token, and certainly also economy of expression. *Iconicity* has the advantages of allowing construal of perceptual-motor analogies and conveying sensory information. *Systematicity* is based on a statistical relationship between patterns of sounds for a group of words and has the advantage of assisting categorization. Dingemanse et al. (2015: 612) conclude that "natural languages contain a mix of all three types of form to meaning correspondences, reflecting their distinctive selective advantages in learning and communication".

We may also look at the mix of these principles in terms of their usefulness. Iconicity is useful in acquiring new expressions but an unnecessary burden once a form-meaning correlation has been firmly established. Here arbitrariness and economy are useful, but they are of little help in acquiring new words. Systematicity is probably the most fundamental principle of language because it enables us to make generalizations, from phonemes to morphemes to words to grammatical structures. Systematicity is not just a useful, but an indispensable, asset of language. It also serves as the precondition for diagrammatic and associative iconicity, i.e., excluding imagic iconicity. It establishes correspondences between signs or forms or meanings of signs—not correspondences between form and meaning. When young children recognize the iconicity of phonesthemes, they do so because they have first discovered a systemic relationship between words and their sounds.

7. Conclusions

The primary goal of this chapter has been to review forms and facets of iconicity. Iconicity is ubiquitous in language and applies to all linguistic levels. Three main kinds of iconicity have been distinguished: imagic iconicity as in *meow*, in which the form of a sign imitates its meaning; diagrammatic iconicity as in *veni, vidi, vici*, in which the structure of signs reflects a conceived

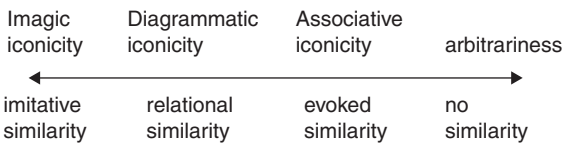


Figure 16.7 Continuum of iconicities

structure; and associative iconicity, as in the onomatopoeic words *bash*, *smash*, and *crash*, in which a shared phonestheme evokes shared meanings. Iconicity is a gradient notion. The kinds of iconicity can be plotted on a continuum according to their degree of similarity, as in Figure 16.7 (see also Waugh 1994: 65).

The left pole of the continuum represents fully motivated form-meaning relationships, the right pole unmotivated, or arbitrary, relationships, and the middle range represents degrees of "relative motivation" in the sense of de Saussure (see Panther, this volume).

Imagic iconicity represents a direct one-to-one mapping between the form and meaning of a word, and in spoken language a mapping between a sound and its phonological rendition. It is the "best" kind of iconicity, but it only lends itself to a small fraction of communicative needs. It goes without saying that imagic iconicity is only suited for basic purposes, as found in early child language.

Diagrammatic iconicity relies on the prior establishment of systemic relationships and hence involves indirect and abstract form-meaning correlations. The number of diagrammatic relationships is limited—here we have focused on the three main types of iconicity: linearity, proximity, and quantity. Diagrammatic relationships are usually taken for granted and hence represent default construals. They only attract our attention in non-default construals, as in the description of sequential events in their reverse chronological order in example (7b).

Associative iconicity depends on systemic word-affinity relations and their condensed commonality in the form of phonesthemes. Phonesthemes are phonemes or phoneme clusters that are associated with expressive sound-symbolic qualities in onomatopoeic words. Their iconicity is indirect and in the eye of the beholder. This is the type of iconicity that language users typically notice. Its range is unlimited and gives rise to creative and appealing associations. Children are especially fond of associative sound symbolism and love rhyming and word games. Waugh (1993: 78, citing Bolinger and Sears 1975) gives the delightful example of the creative use of words by a seven-year-old in referring to the muck at the bottom of an excavation: "if the house is as old as that it's raggy, shaggy, and daggy".

Both imagic and associative iconicity pertain to words, but the difference between them could not be greater: Imagic iconicity relates to direct and tight form-meaning correspondences, whereas associative iconicity relates to indirect and unrestrained form-meaning correspondences. Imagic and associative iconicity represent the endpoints of scales of words that are felt to be more or less *sound-symbolic*, more or less *onomatopoeic*, in short, more or less *iconic*. In view of the scalar nature of lexical iconicity, it is not surprising that the distinction between imagic and associative iconicity is blurred or not even noticeable. Words also have a special status among linguistic units: They are popularly seen as the only meaningful units of language and as such attract more attention than grammatical structures, which are often not even visibly coded. Studies that investigate 'iconicity' are usually also concerned with word iconicity. Diagrammatic iconicity is rarely mentioned in present-day research, but it certainly deserves equal treatment—at least in future research.

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I would like to thank Catherine Schwerin, Linda Thornburg, Klaus-Uwe Panther, Thomas Berg, Chenting Ma, and Yoshihisa Nakamura for their insightful comments on this chapter.

Notes

1 The earliest and often-cited characterization of the ideophone is the one given by Doke (1935: 118), cited in Akita and Dingemanse (2019: 2). In his study of Bantu languages, Doke defines *ideophone* as a "vivid representation of an idea in sound".
2 English Language & Usage, s.v. Etymology of "snob". https://english.stackexchange.com/questions/22147/etymology-of-snob
3 In *Floyd broke the glass with the hammer*, the instrument role of *hammer* is midway in the flow of energy between the agent and the patient but, due to its second-rate importance to the object affected, is not attributed the status of an argument.
4 Hammerström (2015) lists the following frequencies of basic word order in 5,230 languages: SOV: 43.3%; SVO: 40.2%; VSO: 9.5%; VOS: 3.3%; OVS: 0.7%; OSV: 0.3%; NODOM 2.3%; 93% of the languages thus have a word order in which the subject precedes the object.
5 The conditions governing the iconic order of spatial and temporal adjuncts in Chinese seem to be: Free adjuncts denoting a place as in (10a) or a source are placed before the verb and obligatory adjuncts denoting a goal as in (10b) or functioning as a predicate of a state are placed after the verb.
6 As pointed out to me by my colleague Catherine Schwerin, the order *trick or treat* may be historically motivated. Halloween is traditionally seen as the time when spirits rise to play mischief on humans or even harm them. They are to be propitiated to prevent this. Thus the spirit may play havoc (play a "trick") unless it is appeased (given a "treat"). Fear of harm is the default and the "treat" is the action to prevent this, therefore motivating the order of the modern-day ghostlings' threat: "trick or treat".
7 Otto Behaghel (1932: 4) already noted the topmost importance of proximity in language structure: "the primary law is that what belongs close together mentally is placed close together" (daß das geistig eng Zusammengehörige auch eng zusammengestellt wird).
8 www.usertesting.com/blog/gestalt-principles#proximity.
9 See Givón (1991: 90–91) for more examples and linguistic markers distinguishing the kinds of coherence, especially stress and intonational contours.
10 A nice example of the impact of social distance on language has been provided by Klaus-Uwe Panther. Nicknames signal close social distance and are invariably shorter than their given names, as in *Dick* versus *Richard* or *Bess* versus *Elizabeth*.
11 Shakespeare used the phrase *neither rhyme nor reason* in his plays *The Comedy of Errors*, *As You Like It*, and *The Merry Wives of Windsor.*
12 Benczes (2019) chose the modified phrase *Rhyme over Reason* as the title of her book. She notes that, from a linguistic perspective, *rhyme* refers to the poetic and *reason* to the referential function of language (Benczes 2019: 1).

Related Topics

motivation; cognitive linguistics and gesture; signed languages and cognitive linguistics; cognitive linguistics and second language acquisition

Further Reading

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De Cuypere, L. (2008). *Limiting the iconic: From the metatheoretical foundations to the creative possibilities of iconicity in language*. Amsterdam and Philadelphia: John Benjamins. An excellent book critically synthesizing traditional and recent approaches to iconicity.

Haiman, J. (Ed.). (1985). *Iconicity in syntax*. Cambridge: Cambridge University Press. The first collection of groundbreaking articles covering diagrammatic iconicity within the functional framework.

Hiraga, M. K. (1994). Diagrams and metaphors: Iconic aspects of language. *Journal of Pragmatics*, *22*, 5–21. An insightful review of kinds of iconicity illustrated with a wealth of linguistic data.

Waugh, L. R. (1994). Degrees of iconicity in the lexicon. *Journal of Pragmatics*, *22*, 55–70. Excellent survey of lexical iconicity focusing on word affinity relations and continua of iconicity.

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17
MOTIVATION

Klaus-Uwe Panther

1. Introduction

The term 'motivation' is used in ordinary language, but it has a related and more technical sense in the human and social sciences, including linguistics. In the introduction to a collective volume, the cognitive psychologist Shulamith Kreitler (2013: 2) characterizes motivation as "those forces that arouse organisms to action toward a desired goal and provide the reason and purpose for behavior". In everyday language use, this view of motivation manifests itself in utterances like the following (unless indicated otherwise, in this chapter, language data have been retrieved from the Corpus of Contemporary English (COCA) at https://corpus.byu.edu/coca):

(1) What motivated people to give to charity?
(2) His research is motivated by challenging real world problems […].

In (1) and (2), the "organisms"—here human beings—are usually considered to be consciously aware of their specific goals or purposes that induce them to act in a certain way.

In the social and human sciences, motivation research is concerned with the impact of, for example, "personality, emotions, health, and situational factors" (Kreitler 2013: 2) on human behavior. Au, Wan, and Chiu (2013: 158) show that individuals "activate their cultural knowledge to reduce uncertainty in social living, to manage existential terror, and fulfill the need for belongingness". In contrast to the everyday conception of motivation, such motivational factors often operate at a subliminal level. This observation holds for motivation in language as well. Ordinary language users are usually not aware of the grammatical principles that govern the use of their native tongue, and they are also automatically guided by the motivational factors that shape their language system and its use in communication.

In what follows, motivation in language is regarded as a relation between a motivational source and a linguistic target. In a motivational process, the form and/or the conceptual or functional denotatum of a linguistic sign (*target*) may be *shaped* by *language-internal* and *language-external* factors, such as cognition, experience, perception, and sociocultural contexts (see section 4). There is general agreement that the relation between the motivational source and the motivational target is *non-deterministic*, i.e., non-predictive. A given source does not necessarily result in a predetermined target (Langacker 2011: 29–30; Kowalewski 2015: 29). Despite its non-predictability, motivation

is considered a fundamental explanatory concept in functionally and cognitively oriented theories of language.

2. Some Historical Landmarks

In Western philosophy, the presumably first reference to and discussion of motivation in language appears in the work of the Greek philosopher Plato (c. 429–347 BCE). In his dialogue *Cratylus*, two competing conceptions of "names" are discussed (see Sedley 2003: 4). Is there a natural connection between names (e.g., proper names, nouns, and adjectives) and what they designate, i.e., in modern parlance, are linguistic signs *motivated*, or is this relationship purely conventional and arbitrary? These competing theories became known as *naturalism* and *conventionalism*, respectively.

More than 2,000 years later, Arnaud and Lancelot (1660), in their work known as the grammar of Port Royal, propose a naturalistic model regarding the relation between the form of linguistic signs and the thoughts they express. The authors contend that the constituent order *Subject Verb Object* (SVO) of French declarative sentences is motivated by the laws of logical thought. This thesis is repeated in the 18th century by Antoine de Rivarol (2014 [1784]: 50). Rivarol even moves beyond Arnaud and Lancelot in emphasizing the superiority of the French language over other languages in his famous dictum "Ce qui n'est pas clair, n'est pas français […]" ('Everything that is not clear is not French […]').

Arnaud and Lancelot's and Rivarol's claim that French is a logical language and in its "clarity" superior to other languages has been criticized by contemporary linguists as a "language myth" (see Lodge 1998), i.e., it is based on a folk or cultural model rather than a scientific theory of language. Nevertheless, it is worth noting that in many languages the subject of a declarative sentence occurs in initial position. In a typological study of 402 languages, Tomlin (1986: 2) observes that 348, i.e., 87%, of the languages investigated display either the basic word order SOV (45%) or SVO (42%). Do these findings imply that Celtic languages, whose basic word order is VSO (Ball & Müller 2010: 13), are less "logical" or "rational" than languages with the subject in initial position? This conclusion is highly speculative and, to the present author's knowledge, no empirical evidence has been provided for this thesis.

In the early 20th century, one of the founders of structuralism, Ferdinand de Saussure (1995: 67), postulates that the linguistic sign links a concept (*signifié* 'signified') with a "sound image" (*signifiant* 'signifier'). According to Saussure (1995: 100), the link between signifier and signified is arbitrary, i.e., unmotivated.

Saussure illustrates his notion of arbitrariness with monomorphemic words such as French *sœur* 'sister', which exhibits no natural connection between its phonological form (signifier) and its meaning (signified). In other languages, e.g., German, Italian, and Chinese, the concept 'sister' is expressed by the signifiers *Schwester*, *sorella*, and *mèimei*, respectively. Yet, crucially, Saussure also acknowledges that language *must* be motivated to a certain extent in order to fulfill its communicative and expressive functions. Saussure refers to this property as *relative motivation*. Thus, in the case of more complex linguistic signs such as the French numeral term *dix-neuf* (literally 'ten-nine'), he argues that it is clearly motivated to code this number by means of the concatenation of 'ten' and 'nine'.

Without referring to Saussure explicitly, the American linguist Dwight L. Bolinger (1949) challenges the dictum that linguistic signs are basically arbitrary. He contends that motivation, i.e., non-arbitrariness, of linguistic signs is the norm rather than the exception. Bolinger (1949: 52) criticizes "a whole generation of linguists" who have maintained that "forms can be studied apart from meanings". Form may influence meaning, and meaning may have an impact on form. An example of motivation discussed by Bolinger is the use of the adverb *irregardless* with the same meaning as *regardless*. Bolinger (1949: 56) surmises that it is the negative prefix *irr-* in *irrespective*

which has motivated the form *irregardless* and its meaning. Literally, *irregardless* negates *regardless* (compare the contrast between *relevant* and *irrelevant* 'not relevant'). Another case of the intimate connection between form and meaning can be illustrated with the noun *shoot*, which has acquired the meaning 'water slide into a swimming pool', a sense that is motivated by the homophonous noun *chute*. As Bolinger (1949: 58) aptly puts it, "[…] two forms converging phonetically also converge semantically".

Formalist theories of language, e.g., generative grammar, appear to view motivational relations between form and meaning as either a *quantité négligeable* or, at least, a phenomenon not relevant to an explanatory theory of language. Consider, for example, the following methodological principle formulated in a textbook of generative syntax: "No syntactic rule can make reference to pragmatic, phonological, or semantic information" (Radford 1988: 31). Prima facie, this postulate, known as the *Autonomy of Syntax Principle*, suggests that there exist no motivational relations between syntactic form and conceptual meaning and/or pragmatic function. However, Newmeyer (1992: 756) argues that iconic principles do not present a challenge to generative grammar but are compatible with the hypothesis that "grammatical structure is a reflection of conceptual structure" (for the term 'icon', see section 3). In other words, Newmeyer does not reject the idea that grammatical structure can be motivated iconically by conceptual structure. In a later publication, Newmeyer (1994) cites Chomsky's (1975: 56) statement that "[s]urely there are significant connections between structure and function; this is and has never been in doubt". Chomsky rejects the position attributed to him by the philosopher of language John Searle (1972) that there exists no connection between language structure and the communicative function of language. Finally, as again pointed out by Newmeyer (1994: 245), Chomsky agrees with Searle's thesis that communicative "needs" have an influence on language structure.

In functional and cognitive linguistics (see, e.g., Givón 2001; Goldberg 2006; Lakoff 1987; Langacker 2011), the importance of motivation as a key theoretical concept is generally accepted, and important research on motivation has been conducted by scholars working in this tradition.

3. C. S. Peirce's Categorization of Signs

Roman Jakobson, one of the leading figures in functionalist linguistics, makes a strong case for the ubiquity of motivation in natural language. He is also among the first linguists to recognize the important contribution of the American philosopher and semiotician Charles S. Peirce to the theory of signs, including linguistic signs (see Jakobson 1965, for a succinct introduction). Peirce distinguishes three types of signs, which he calls *symbol*, *index*, and *icon* (see Buchler 1955: 102–103). In the case of a symbol, the relation between the form and the meaning of the sign is purely conventional and unmotivated, i.e., arbitrary in the Saussurean sense. An index is characterized by a "causal or natural relation" (Merrell 2001: 36) between its form and its meaning, and an icon displays a relation of similarity between form and meaning. The Peircean trichotomy of signs can be illustrated with visual signs, such as traffic signs and photographs.

Figure 17.1 shows a traffic sign that is a symbol in the Peircean sense.



Figure 17.1 Symbol for 'Yield to traffic on priority road' (author's drawing)

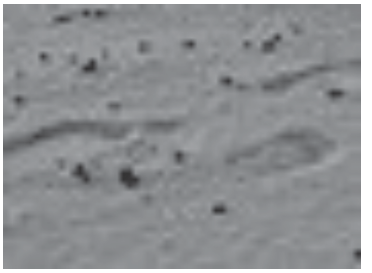


Figure 17.2 Footprints in the desert → camels (author's photo)
X → Y: indexical relation.

The inverted triangle in Figure 17.1 is unmotivated in the sense that its meaning 'Yield to traffic on priority road' cannot be inferred from its geometrical form, but its directive sense has to be learned and memorized.

An index is a "pointer", as suggested by the meaning 'forefinger' of its Latin etymon. Indexical signs exhibit a natural (often causal) connection between form and the meaning. For example, smoke is an index of fire, i.e., the visual or olfactory perception of smoke is interpreted as being caused by fire. Another example is the photo in Figure 17.2, which shows footprints in the desert sand that are indexical of, for example, camels having passed by.

The photo in Figure 17.3 can serve as an example of an icon. The (two-dimensional) picture bears a relation of similarity to a boy in three-dimensional reality.

To summarize, symbols are unmotivated (arbitrary), whereas indexes and icons are motivated by definition because they exhibit a natural connection between the form of the sign and what it signifies. It has however to be kept in mind that signs may be more or less typical exemplars of a specific semiotic category, and especially linguistic signs often belong to more than one semiotic type. The 'yield' sign in Figure 17.1 is a symbol, but, arguably, its red-colored outlines can be seen as having an indexical function: Many people associate the color 'red' with meanings such as 'danger' and/or 'warning'. As to the photo of the boy in Figure 17.3, apart from its iconic character, it can be interpreted indexically as well. From the boy's bodily posture and facial expression his emotional state



Figure 17.3 Photo of a boy ⇒ a boy (Copyright: author)
X ⇒ Y: iconic relation.

can be inferred. The boy avoids focusing on the camera, frowns, his lips are pursed downward, his eyes are pinched, and he bends slightly forward. All these indexes (or, more specifically, symptoms) may indicate a certain mental state of moodiness, anxiousness, and reluctance to be photographed.

What holds for visual signs, is also true of linguistic signs. They frequently instantiate more than one semiotic category, a point that, according to Lehmann (2007: 20), was already made by Peirce.

4. Motivation in Language

4.1 Motivation and Convention

In order to gain a better understanding of motivation and its role in language, it is helpful to consider its relation to convention. This relationship is diagrammed in Figure 17.4.

Motivation and convention are scalar concepts, i.e., there exist in-between values between the opposite poles 'conventional' vs. 'non-conventional' and 'motivated' vs. 'unmotivated', respectively. Concerning convention, there is a fundamental difference between indexes and icons, on the one hand, and symbols, on the other. As already mentioned in section 3, indexes and icons are motivated by definition, and they can be conventional or non-conventional to different degrees. A well-known example of a conventional and both iconically and indexically motivated sign is the bird name *cuckoo*. The phonological form of this noun iconically reflects the call of the bird and, at the same time, the bird's call stands indexically (i.e., metonymically) for the bird itself.

Symbols are unmotivated, i.e., arbitrary in Saussure's terminology. From this premise it follows that symbols are necessarily conventional because non-conventional symbols cannot fulfill communicative functions in language since they are uninterpretable. To see this, consider a sequence of made-up forms that are phonetically transcribed in (3). They are phonologically possible in American English, but they have no meaning and hence are not stored in the mental lexicon of native speakers of English.

(3) [krəb 'kræspjʊlət lim]

In contrast, motivated signs (indexes and icons) can be more or less conventionalized because they offer clues for their interpretation, i.e., similarity between form and meaning in the case of icons and associative relations in the case of indexes. An example that involves an indexically (and inferentially) motivated interpretation is:

(4) "It's cold in here", she complained.

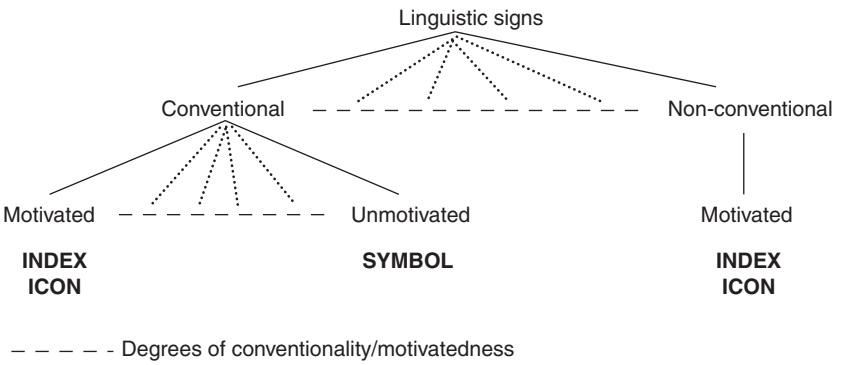


Figure 17.4 Conventionality and motivatedness scales
Source: Adapted from Panther (2013: 409).

In (4), the female character referred to by the personal pronoun *she* literally performs an *assertive* speech act. Further on in the narrative, she calls the location referred to by the deictic adverb *here* a "miserable hovel". From the literal sense of her assertion several indexically and inferentially motivated interpretations can be derived (see section 4.2 and Figure 17.5). First, the narrator characterizes the woman's speech as a *complaint*. And, second, another inference that can be drawn from the 'complaint' interpretation is that the literally assertive speech act in quotation marks is ultimately intended as a *request* to the addressee to do something about the low temperature in the hovel.

4.2 Motivational Factors

In this section, motivational factors that shape language and its use are presented in more detail and illustrated with examples. A (non-exhaustive) set of motivational factors is diagrammed in Figure 17.5.

In Figure 17.5, the outer circle represents the cognitive system as a whole, which is influenced by "peripheral" parameters such as embodiment (bodily experience), emotion, perception, culture, behavior, and communication. All of these factors may motivate (via cognition) properties of the language system and its use (innermost circle). In fact, these components often interact with one another, i.e., motivation is a potentially bidirectional relation (see Panther & Radden 2011: 2). For example, perceptions are cognitively processed and coded in language, e.g., in the lexicon, in idioms, and grammatical constructions, and cognitive and linguistic factors may feed back into perception themselves, i.e., there is an influence from cognition and language to how humans perceive the world (for more detailed discussion of this bidirectional influence, see Panther & Radden 2011). In what follows, the focus is only on one directionality of motivation, i.e., from peripheral and cognitive factors to language structure and use (indicated by means of unidirectional arrows).

The innermost circle in Figure 17.5 is labeled the *language system*. The curved arrow indicates that the language system is, to some extent, motivated by its own structural properties. This reflexive relation is referred to as *systemic motivation*, which is discussed in the following section.

4.2.1 Systemic Motivation

It is generally assumed in linguistics that the grammar of a language forms at least a system (though not without exceptions) in which everything is interrelated, i.e., "un système où tout se tient", a quotation that goes back to the French linguist Antoine Meillet (Hewson 1990). Systemic motivation is also known as *ecological motivation* (Taylor 2004). Dingemanse Blasi, Lupyan, Christiansen, and Monaghan (2015) claim that systematicity, i.e., systemic motivation, plays a major role in the learning and recognition of grammatical categories. For example, the infinitival ending of Italian verbs is *-are*, *-ere*, o*r -ire.* According to Dingemanse et al. (2015), such phonological cues facilitate the acquisition of verbs and the integration of new verbs into the grammatical system. Examples illustrating the latter process are the German verbs *mailen* '(to) send an email message' and *downloaden* '(to) copy data from a computer', which are English loan words but recognizable as German verbs because of the infinitival morpheme *-en* following the stems *mail* and *download*, respectively. In English, the phonological cues for identifying infinitival verb forms are not as straightforward as in languages with richer inflectional systems. Still, there are also cues for identifying English verbs. For example, for a restricted set of verbs, the morpheme *-ize* [-aiz] provides a cue that the form is a verb—witness lexemes like *analyze*, *fossilize*, *pasteurize*, and *hospitalize.* Further cues that allow to distinguish verbs from nouns are phonological and/or prosodic (stress). Verbs such as *use*, *excuse, abuse* end in

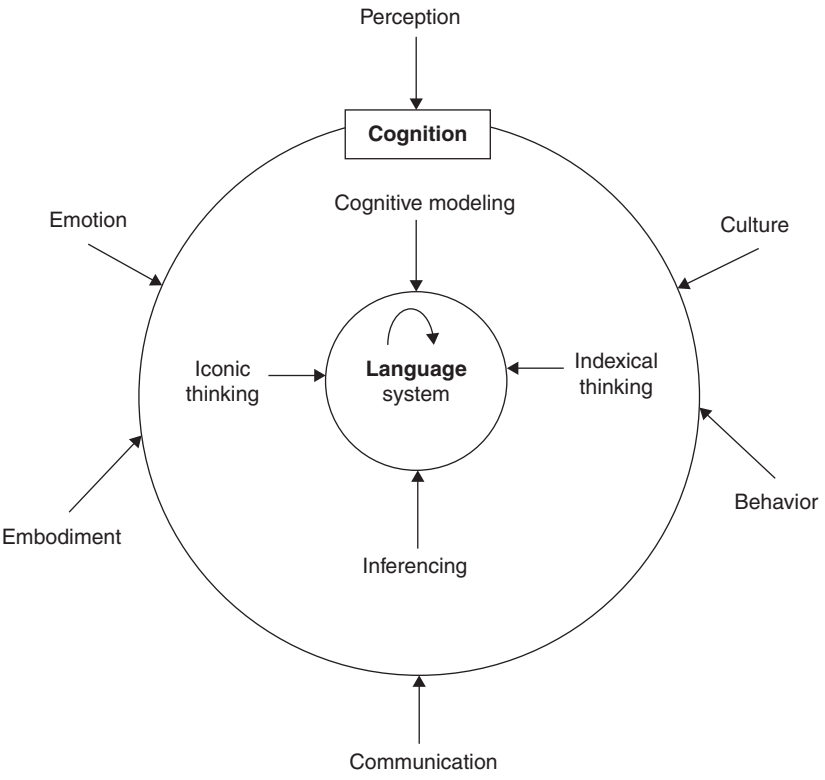


Figure 17.5 Motivational factors shaping the language system

[-z], whereas the corresponding nouns with the same spelling are pronounced with a final [-s]. Phonological and prosodic features may also work in tandem to distinguish nouns from verbs. Two examples are *contact* and *suspect*: [ˈkɑnˌtækt] (noun) vs. [kənˈtækt] (verb) and [ˈsəsˌpɛkt] (noun) vs. [səˈspɛkt] (verb).

In some cases, the integration of a loan word into the language system is more indirect. Consider the English noun *computer* that has been borrowed verbatim by a number of languages. Interestingly, in Italian, typically no formal distinction is drawn between the singular and the plural of *computer* (although sometimes the English plural *-s* is used). However, a singular-plural distinction can be made by means of, for example, the definite article, *il computer* vs. *i computer* ('the computer' vs. 'the computers'), and quantifiers and adjectival modifiers such as *alcuni computer* ('some computers') and *multipli computer* ('multiple computers'), respectively (retrieved from www.linguee.com/english-italian/translation/computers.html).

4.3 Cognitive Factors of Motivation

Among the cognitive motivational factors influencing language, we find cognitive models, iconic and indexical thinking, and inferencing. Cognitive models are here understood as knowledge structures by means of which humans make sense of the world (see, e.g., Dirven, Franck, & Pütz 2003). Iconic thinking is, among other things, activated in the creation and understanding of metaphors, which, in cognitive linguistics, are conceived of as mappings from a source domain onto a distinct target domain (Hiraga 2005). The target domain is conceptually structured analogously to

the source domain (Lakoff & Johnson, 1980), as in Shakespeare's metaphor *The world's a stage* (*As You Like It*, Act II, Scene VII), in which actors and properties of the theatrical stage are explicitly mapped onto human beings and their attributes in the real world. Iconicity can also be observed on the sub-morphemic level of language. Language users associate sounds or sound clusters, which are called *phonesthemes* or *ideophones*, with certain sensory perceptions. In English, verbs that begin with the sound sequence [gl-], such as *glisten*, *glitter*, *glow*, *glare*, and *glimpse*, are associated with visual perception. Indexical thinking manifests itself, for example, in metonymies such as *Mary is not in the address book* where *Mary* does not refer to Mary as a person but to her name. Finally, the cognitive ability to draw inferences in the construction of linguistic meaning is a major factor that motivates properties of the language system and its use. Examples of inferential motivation are given in section 4.4.6.

4.4 Peripheral Factors Shaping Cognition and Language

The motivational factors named outside the circle labeled 'cognition' of Figure 17.5 often overlap or act in tandem in shaping properties of the language system. The most comprehensive factor is most likely embodiment, which has an impact on how, for example, perceptions, emotions, and behavior are conceptualized and coded in language.

4.4.1 Embodiment

According to Gibbs (2005: 1), "[e]mbodiment […] refers to understanding the role of an agent's body in its everyday, situated cognition". Pfeifer and Bongard (2007) argue that even the ability of intelligent thinking and reasoning is not possible without a body.

The important role of properties and activities of the human body in shaping cognition and language can be illustrated with how languages and cultures conceptualize and code numbers. For example, the number system with the base *10* is motivated by the anatomical fact that humans have ten fingers which, in many cultures, are also gesturally used to signify numbers. If toes are added, the base becomes *20*, and this base is reflected in numbers like French *quatre-vingt* (literally 'four-twenty', i.e., '4 × 20') and in Italian dialects like Piedmontese and Sicilian (see Menninger 1969: 49). Until 1971, in the United Kingdom, the *pound* was worth 20 *shillings*, which, in turn, equaled 12 *pence*. The now slightly archaic term *score*, in one of its senses, denotes a set of 20—witness Abraham Lincoln's Gettysburg address (1863), in which *four score and seven* stands for *87* in the decimal system:

(5) Four score and seven years ago our fathers brought forth on this continent, a new nation, conceived in Liberty, and dedicated to the proposition that all men are created equal. (www.historynet.com/gettysburg-address-text)

Embodiment manifests itself especially in metaphors. Many conventional metaphors are based on bodily activities, as in the following examples from Gibbs (2005: 98):

(6) She easily grasped the difficult concept. (UNDERSTAND IS GRASPING)
(7) He has an appetite for learning. (ACQUIRING IDEAS IS APPETITE FOR FOOD)

In a recent monograph, Littlemore (2019) shows that, in addition to universal embodied metaphors, there is substantial cross-linguistic variation in embodied metaphors. Embodied metaphors are shaped by factors such as gender, personality, body shape, and disability. Furthermore, people's understanding of the world is often mediated by culture-specific conceptions of the human body

and its parts. One example of a culturally shaped metaphor is the Western conception of the heart as the seat of emotions and feelings, which shows up in expressions like the following:

(8) I say thank you, thank you, thank you from the bottom of my heart.
(9) She broke his heart.

In (8), the heart is conceptualized as a "container" of gratitude, and in (9) as the seat of love and affection. In contrast, according to Yu (2015: 235), in Chinese culture one finds a broader conceptualization of the heart "as the central faculty of cognition". It is associated with all kinds of "cognitive and affective aspects of a human person, such as mental, intellectual, rational, moral, emotional, dispositional, and so on" (Yu 2015: 235).

4.4.2 Emotion

The conceptualization of emotions is often shaped by indexical (metonymic) and iconic (metaphorical) thinking. An example of indexical thinking is the verb *blush*. It denotes the process of becoming red in the face, which is a symptom, i.e., an index, of 'a feeling of embarrassment or shame', as in (10):

(10) And then I blushed at having volunteered too much information, a problem I often had with strangers.

Embodied metaphors that convey emotions like sadness and fear are lexicalized as *weigh down* and *be torn apart*, as in (11) and (12), respectively:

(11) Despair weighed her down […].
(12) I need to feel we have a purpose here or I'll be torn apart by my fear […].

4.4.3 Perception

Perceptual experiences have a deep impact on both cognition and language. As early as in the 17th century, the philosopher John Locke (1690) challenged the Cartesian notion of innate ideas and contended that knowledge is acquired through the senses. In natural language, knowledge and understanding are indeed often conceptualized in terms of sense perception, in particular, visual perception, as in the following sentences:

(13) I see what you mean.
(14) Essentially, when she was young, a seer told Cersei […] about marrying a king and the children she would lose.

In (13), *see* is interpreted metonymically and metaphorically as 'understand', and, similarly, *seer* in (14) figuratively refers to someone who can 'foresee', i.e., know, the future.

The importance of sense perception in the acquisition of knowledge can also be seen in the judicial system, in which direct and indirect evidence are contrasted. Direct evidence is defined as "evidence of a fact perceived by a witness with his own senses" (Osborn 1927: 103). A subtype of indirect evidence is hearsay, which is "not actually perceived by a witness with his own senses, but proved by him to have been stated by another person" (Osborn 1927: 103). Consequently, an eyewitness account of some event, e.g., of a crime, is normally considered to be more reliable than testimony based on hearsay.

Perception is also a crucial motivational factor of grammatical structure and communicative function. Adopting and adapting tenets from gestalt psychology (see, e.g., Köhler 1929), Talmy (2000) demonstrates the relevance of the concepts *figure* and *ground* in the analysis of phrasal and sentential structure. Talmy (2000: 314) defines the figure as "a moving or conceptually movable entity whose site, path, or orientation is conceived as variable". The ground is, following Talmy (2000: 314), a "reference entity […] with respect to which the Figure's site, path, or orientation is characterized". Consider the contrast between the following sentences:

(15) The bike is near the house.
(16) The house is near the bike.

Talmy notes that sentences (15) and (16) do not have the same function, although they are truth-conditionally equivalent. In (15), *the bike* constitutes the figure and *the house* is the ground (the latter having, moreover, "a set location within a reference frame"). In example (16), these specifications are reversed, i.e., somewhat surprisingly, the perceptual function of figure is assigned to the static object *house* and the function of ground to the movable object *bike.*

An especially interesting phenomenon studied by gestalt psychologists is the perceptual phenomenon of figure-ground reversal, which can be experienced by looking at Figure 17.6 (see, e.g., Köhler 1929: 189–190).

Figure 17.6 can be perceived in two ways, and viewers characteristically experience them as sudden switches from one to another visual interpretation. On the one hand, the picture can be seen as showing a white vase (figure) against a black ground. On the other hand, it can also be perceived as displaying two black faces in profile (figure) against a white ground.

Phenomena comparable to visual figure-ground reversal can be found in natural language. Compare the interpretations of the noun phrase *a caricature of a politician* in (17) and (18):

(17) The newspaper showed a caricature of a politician on the front page.
(18) This man is a caricature of a politician.

The ambiguity of *a caricature of a politician* can be accounted for in terms of figure-ground reversal (see Panther 2014: 35, for discussion of similar examples). In (17), the italicized noun phrase refers to a drawing (e.g., cartoon) of a politician; whereas in (18), it designates a 'a ludicrous and grotesquely unqualified politician'. In (17), *a caricature*, i.e., the picture, is the ground and *a politician* the figure of the nominal construction. This relation is reversed in (18), with *a caricature* functioning as the figure and *a politician* as the ground.

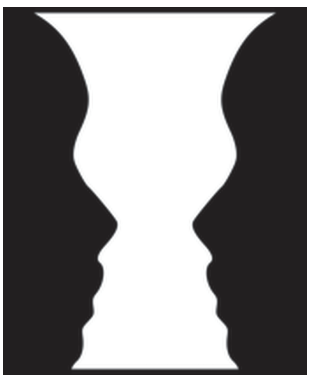


Figure 17.6 Figure-ground reversal
Source: https://en.wikipedia.org/wiki/Figure-ground_(perception) (accessed January 29, 2020).

4.4.4 Sociocultural Models

There is strong evidence that language and other sign systems are motivated by cultural and folk models (Wierzbicka 1997; Friedrich 2006; Langacker 2008; Panther & Thornburg 2012; Panther 2014). As a non-linguistic example, consider the sculptures of a bull and a bear in front of the New York Stock Exchange on Wall Street. The cultural meanings of *bull* and *bear* show up in compounds like *bull market* and *bear market*, respectively. In a bull market, the price of stocks quickly moves *up* over time; in a bear market, the opposite tendency is observed: Stocks move *down*. Brokers and investors attribute certain behavioral traits to the animals in question, and these traits are projected iconically, i.e., metaphorically, onto the fluctuations of the stock market. Bulls are cognitively modeled as 'dynamic', 'strong', and 'aggressive', whereas bears, despite their physical strength, evoke attributes such as 'inactive', 'sluggish', and 'hibernating'.

In English, animal folk models motivate phrasal verbs such as *rat out* 'inform on' or *chicken out* 'not do something because one is afraid'. The meanings of these verbs are based on (negative) animal models of rats and chickens, respectively. Rats are conceived of as being vile and chickens as fearful, and it is these attributes that are metaphorically mapped onto humans (see Panther & Thornburg 2012; Panther 2014).

The significance of cultural models, which are reflected in cultural keywords (Wierzbicka 1997), can also be illustrated with expressions like *mere talk*, *just a theory*, or *just semantics*, whose meanings and uses are motivated by folk models of language (italics added):

(19) The 2020 election may provide us with the confluence of circumstances necessary to move the conversation in the direction of action rather than *mere talk*.
(20) To use the word 'tip' instead of a usury charge, an interest rate or a fee, it's *just semantics*. (NOW Corpus)
(21) Human-caused climate change isn't *just a theory*, it's reality.

Example (19) is based on a folk model that contrasts speech acts, which are just talk, with "real action" (see Panther 2016: 180–181, for further discussion). The use of *just semantics* in (20) is based on a folk model of language as well. Technically, semantics is the discipline that is concerned with meaning, both descriptively and theoretically. However, in certain genres, e.g., journalese and media talk, *semantics* is often used pejoratively with the meaning 'playing with words and meanings, but having no real significance'. Finally, in (21) *just a theory* evokes a model of speculative thinking that is not supported by empirical evidence, i.e., does not (necessarily) correspond to reality, and the speaker, possibly a scientist, has to deny explicitly that human-caused climate change is unrealistic speculation.

As a final example of sociocultural factors motivating properties of language, consider sequences of conjuncts as in the italicized expressions in (22)–(24) (italics added):

(22) In two hours, multiple groups of *men, women, and children* cross the river.
(23) *Women, men, and children* are saved every year from forced labor […]
(24) During the long night, *children, women, and men* often doze alongside their protector saint […]

It is not accidental that the order *men, women, and children*, as in (22), is by far the most frequent one, as can be seen in Table 17.1.

The overwhelming frequency (94%) of the order *men, women, and children* is motivated by a patriarchic sociocultural model, which is iconically reflected in the sequential order of the conjuncts. Cooper and Ross (1975: 65) also observe that, in conventionalized binary conjuncts, the order 'male'–'female' is prevalent, such as in *husband and wife*, *brother and sister*, or *boy and girl*.

Table 17.1 Culturally motivated order of conjuncts

Pattern	*N*	*%*
men, women, and children	**374**	**94%**
men, children, and women	1	0.25%
women, men, and children	9	2.25%
women, children, and men	10	2.5%
children, men, and women	2	0.5%
children, women, and men	2	0.5%
TOTAL	**398**	100%

Source: COCA.

4.4.5 Behavior

Words and expressions denoting behavior are often used as indexes, i.e., metonymies, to refer to human attitudes, emotions, and feelings. As a consequence, in natural language, many figuratively motivated expressions and constructions can be found that relate observed behavior to some underlying mental or emotional cause, as in (25) and (26). The following corpus data also instantiate embodiment, i.e., the understanding of abstract concepts in terms of bodily activity:

(25) My mind was staggered. I could not believe the evidence I had witnessed.
(26) The economy is still limping along […].

As to (25), the bodily behavior denoted by the verb *stagger*, i.e., 'walk or move unsteadily, as if about to fall', is an index (symptom) of some muscle, spine, or nerve problem. Metaphorically, *stagger* motivates senses such as 'shock, astonish'. The verb *limp*, which literally refers to slow movement caused by a damaged foot or leg, motivates metaphorical uses such as (26), in which the development of the economy is characterized as slow and non-dynamic.

4.4.6 Communication

Language and its use are motivated by principles that guide successful and efficient communication. Grice (1975) proposes a rational model of conversation that relies on a general Cooperative Principle and various conversational maxims that interactants are expected to abide by. Conversational maxims trigger cognitive inferences, which are called *implicatures* in contemporary pragmatics (see also Horn 1984; Levinson 1995, 2000; Sperber & Wilson 1995). The observance of communicative maxims (or their recognizable flouting) motivates properties of lexical items, grammatical structure, and discourse.

By way of example, consider the Maxim of Quantity that requires speakers to provide as much information as they can in a given communicative situation (Grice 1975: 45). Suppose an eyewitness to a break-in provides the police with the following information:

(27) The burglar was about six feet tall and wore a hood.

In uttering (27) the witness invites the pragmatic inference (implicature) that he does not know the suspect's identity. Now, if it turns out that the witness actually recognized the burglar, then he has not given sufficient testimony and misled the police by his statement, even if both propositions asserted in (27) are true. Furthermore, arguably, the witness also violates Grice's Maxim of Relevance because, in the given context, the most relevant information for the criminal investigators

is that the witness recognized the burglar, and it is this crucial piece of information that the witness keeps to himself.

The Gricean maxims are part and parcel of a Western cultural model of rational communication. Nevertheless, ethnologists have pointed out that these maxims do not necessarily hold universally. For example, Eleanor Ochs Keenan has shown that, in rural Malagasy society, speakers systematically do not abide by the maxim 'Say as much as you can'. Ochs Keenan (1976: 70) finds that in small communities of Madagascar information is considered a "rare commodity", and hence interactants are not expected to convey as much information as they can.

In English and many other languages, the Quantity Maxim holds not only on the level of discourse as in (27), but it may also have an effect on the interpretation of lexical items, e.g., modals, quantifiers, and mental verbs (italics added):

(28) Was he naive? *Perhaps*. Was he mistaken? *Perhaps*.
(29) *A few* people laughed, a few people cried, *most* people were silent.
(30) We *believe* he will change his policy.

In (28), the modal adverb *perhaps* triggers the default inference that the speaker is *not certain* about whether the person referred to by the pronoun *he* was naïve or mistaken. In (29), the quantifier *a few* strongly invites the inference that *not many*, *not most*, or *not all* people were silent, and (30) conveys the implicature that *we* do *not know* for sure that *he* will change his policy.

Finally, there is also evidence, as argued by, e.g., Hawkins (2004), that communicative factors such as efficiency and ease of processing motivate syntactic structure. For example, among other processing principles, Hawkins (2004: 26) proposes a principle of *minimization* of syntactic domains that can be illustrated with the structural contrast between (31) and (32) (labeled bracketing indicates syntactic structure: VP = verb phrase, NP = noun phrase, and PP = prepositional phrase):

(31) Mary [$_{VP}$ *gave* [$_{NP}$ *the book she had been searching for since last Christmas*] [$_{PP}$ *to* Bill]].
(32) Mary [$_{VP}$ *gave* [$_{PP}$ *to Bill*] [$_{NP}$ the book she had been searching for since last Christmas]].

Hawkins observes that sentence (31) requires the processor to parse 12 words (in italics) in order to identify the three "syntactic sisters" within the verb phrase (VP) correctly. In contrast, in (32), only three (italicized) words have to be parsed to grasp the internal syntactic structure of the VP. Hawkins argues that, for ease of processing reasons, structures like (32) with a "heavy" noun phrase (NP) at the end of a sentence are preferred over structures like (31). Consequently, sentences of type (32) can be expected to be more frequent in language use than those of type (31). High frequency is a motivating factor that leads to conventionalization, i.e., integration into the language system of structures like those exemplified by (32).

4.5 Other Aspects of Motivation

4.5.1 Loss of Motivation (Demotivation)

Demotivation refers to the phenomenon that an originally motivational factor is no longer transparent to the ordinary language user. Ariel (2008: 123) observes that motivation is not a transitive relation, where 'transitive' is to be understood in its logical sense. Thus, in a motivational chain M_1, M_2, ..., M_n, the longer the chain, the more likely M_n will not be recognized as being motivated by M_1. For example, the English past tense suffix *-ed* might have developed out of an inflected form of the verb *do*, so that in Proto-Germanic the present-day English form *walked* would have been the equivalent of 'walk-did' (see Barber, Beal, & Shaw 2009: 95; Hogg & Fulk 2011: 259).

Another example of demotivation can be observed in exclamations such as the following:

(33) Thank goodness!
(34) Goodness knows how much was smuggled in. (iWeb)

In (33) and (34), the noun *goodness* is used as a euphemism for *God*, i.e., the use of the latter term is avoided for cultural (religious) reasons. The first syllable of the noun *goodness* is also phonologically similar to *God*, but it is questionable whether the connection between *good-* and *God* is still transparent for present-day language users.

In the case of the verb *atone* 'make amends or reparation', its historical origin and motivation is most likely totally opaque to the present-day language user. The verb combines the preposition *at* with the numeral *one*, with the original Middle English sense 'make or become united', i.e., the verb refers to a 'reparation or expiation of sins' and is an act of reconciliation with God. If the original morphological and syllabic structure had been preserved, the present-day pronunciation of *atone* should have been [ætˈwʌn], but in fact it is [əˈtəʊn] in present-day English, i.e., the final [t] of the preposition *at* functions as the onset of the second syllable and *-one* is pronounced [əʊn] as in *only*.

4.5.2 Competing Motivations

Motivational factors can compete with one another and there are various ways of how conflicts can be resolved. As a simple example, consider the potential conflict between the motivational factors 'patriarchism' and 'politeness'. A speaker who, at some social event, addresses the participants as *Ladies and Gentlemen!* does not abide by the patriarchally motivated sociocultural hierarchy according to which males should be named before females. Instead, the speaker implements a competing principle of courteous behavior—what one could call the "ladies first" rule. In other words, politeness cancels out patriarchism (see also Cooper & Ross 1975). This politeness principle also motivates extralinguistic behavior. For example, a polite gentleman would open a door for a lady and let her enter a building or room first, or he would offer her his seat on an overcrowded bus.

Another motivational factor that conflicts with the male-first principle is based on the assumption that children are physically and cognitively "weaker" than adults, and that women are less strong than men, with the linguistic effect that the male-first order of conjuncts is reversed, as in *defenseless children, women, and men* (retrieved from COCA) where the (supposedly) weaker, i.e., defenseless, humans, i.e., children and women, who have to be protected, are named before the men.

4.5.3 Arbitrariness

One of the central design features of human languages is what structural linguists call 'duality of pattern' (Trask 1999: 1–3, 152) or 'double articulation' (a loan translation from Martinet 1980: 13–15). Human languages comprise meaningful units, such as morphemes, words, sentences, etc., which are composed of meaning-distinguishing sounds (phonemes) that have no meaning themselves. This two-level organization of language has definitive advantages over one-level systems that directly correlate forms of signs with meanings. On the basis of a limited number of meaningless elements (phonemes), an open-ended number of meaningful signs of different size and complexity can be constructed. Such a system of arbitrary signs is rich in its expressive and communicative potential, and, at the same time, highly economical. The arbitrary character of many parts of the language system ultimately makes sense. According to Dingemanse et al. (2015: 603, 610–611) arbitrariness is "motivated" in that it facilitates "meaning individuation through distinctive forms".

5. Conclusion and Desiderata for Future Research

The present chapter has a made a case for motivation as an indispensable analytic concept in linguistic theory. Motivational processes cannot be predicted, as has been noted by many functional and cognitive linguists, but the concept of motivation allows insightful explanations of many formal, conceptual, and pragmatic properties of simple and complex linguistic signs, ranging from sub-morphemic units, morphemes, words, sentences, to discourse structure. Desiderata for future research include more work on competing motivations and the way that motivational conflicts are resolved, as well as comparative cross-linguistic studies on motivation from the perspective of language typology.

Further Reading

MacWhinney, B., Malchukov, A., & Moravscik, E. (Eds.). (2014). *Competing motivations in grammar and usage*. Oxford: Oxford University Press. (This collective volume with contributions by leading scholars deals with the effects of competing motivational factors on grammatical relations and word order, syntax, morphology, and the lexicon. In the introductory chapter, among other things, Moravscik outlines how motivational conflicts are resolved.)

Panther, K.-U., & Thornburg, L. L. (2017). *Motivation and inference: A cognitive linguistic approach.* Shanghai: Shanghai Foreign Language Education Press. (The book contains a number of studies that focus on the motivation of language structure and use and the role of inferencing in the production and comprehension of conceptual and pragmatic meanings.)

Radden, G., & Panther, K.-U. (Eds.). (2004). *Studies in linguistic motivation* (Cognitive Linguistics Research 28). Berlin: Mouton de Gruyter. (Following an introduction by the editors, this volume covers a variety of topics such as ecological motivation (called 'systemic motivation' in this chapter), genetic motivation (i.e., historical motivation), experiential motivation, and cognitive motivation.)

Related Topics

iconicity; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; cognitive pragmatics; multimodality; embodiment; culture in language and cognition

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18

GRAMMATICALIZATION, LEXICALIZATION, AND CONSTRUCTIONALIZATION

Renata Enghels and Mar Garachana Camarero

1. Introduction

Over the last few decades, we have witnessed a proliferation of studies on grammaticalization, lexicalization and, more recently, constructionalization. According to their most basic definitions, these notions refer to different phenomena of language change which ideally begin with a lexical form with a concrete meaning and end respectively in a grammatical unit (such as a clitic or an affix) or zero, a new lexical unit, or a fixed grammatical pattern or construction. During these processes, the original lexical forms lose semantic content as well as morphosyntactic and phonetic form, or are at least subject to considerable transformations in these domains. Extensive bibliographies reflect ongoing discussions concerning every possible aspect of these linguistic processes.[1] Besides the basic terminology,[2] the bulk of the work centers on the definition of grammaticalization and lexicalization, as well as on their internal relationships, for instance, are cases of grammaticalization diametrically opposed to lexicalization or do both phenomena overlap? Concerning constructionalization, most works stipulate that it does not fundamentally differ from former grammaticalization studies, but that the advantage of this theory lies in its overarching approach to phenomena of lexical and grammatical change.

Still, a common feature of these different *-ization theories* of linguistic change is that they explain particular cases of changing grammar primarily as being a consequence of concrete language use (cf. the notion of *Emergent Grammar* as opposed to the *A Priori Grammar Postulate*, Hopper 1987). Language change is seen as the collective entrenchment of an innovative language trait which was first produced by individual language users when striving for communicative success and efficiency. Grammaticalization, lexicalization, and constructionalization may then be seen as the outcome of selection processes which function according to Keller's (1989) *invisible hand* theory and change the use of a linguistic unit (Harder & Boye 2011). To give an example, the grammaticalization of discourse markers such as *well, I mean, I think, you know*, etc. can be understood as the process through which lexical items are taken from sentence grammar and are recycled to contribute to discourse organization. Indeed, an efficient structuring of turns is crucial to guarantee successful communication. Therefore, speakers may extend the use of individual adverbs, verbs, or phrases to contribute to their overall conversational goal, changing both their function and form (Heine 2013; and *infra* section 2.3).

This common framework explains why grammaticalization (and other theories) have mainly developed in parallel with the emergence and expansion of the cognitive and functional linguistics enterprise. As opposed to (early) generative Chomskyan linguists, who almost exclusively examine formal and (morpho)syntactic phenomena, marginalizing semantics and pragmatics, and consider language to be a faculty independent from other forms of cognition, the cognitive-functional approach is built around at least three tenets: (1) *integration* meaning that language is processed in a way parallel to other cognitive abilities such as memory, the motor system experience, and perception; (2) *symbolization* meaning that different linguistic levels constitute a continuum of symbolic structures or form-meaning pairings; linguistic meaning, including encyclopedic knowledge, pragmatic, and semantic meaning, is believed to interact with formal structures in a fundamental way; and (3) *observation* or the fact that the framework does not refer to universal, innate principles but posits that language is acquired through real discourse (e.g., Evans & Green 2006 among many others).[3] Within this framework, language is defined as a social and cultural phenomenon whose nature and structure depend on language users, their contexts, and the purpose of their communication acts. Another fundamental of language is that, above all, it obeys the principle of economy. The human language faculty optimally strives for good management of the available resources, thus implying a minimum amount of effort to obtain a maximum result. As is shown throughout this chapter, these principles underlie the above-mentioned theories of language change in a fundamental way. For instance, in accordance with the symbolization principle, grammaticalization involves changes in both form (structure) and meaning (function) of linguistic expressions.

Because of the fundamental and highly topical nature of the phenomena discussed here, the reader may easily find other introductory and summarizing chapters such as the ones by Heine (2003), Traugott (2010), or the edited book by Narrog and Heine (2011), to name just a few. Given that the main objective of the present chapter is to familiarize the reader with different theories and methodologies, this will inevitably lead to a discussion of the main contributors to the overall theory.[4] The remainder of the chapter is organized around four sections, mainly corresponding to the three phenomena of linguistic change that are analyzed, namely grammaticalization (section 2), lexicalization (section 3), and constructional change or constructionalization (section 4). Section 5 will conclude the chapter and provide suggestions for further research.

2. Grammaticalization

2.1 Historical Perspectives and Divergent Views

Following Heine (2003: 575–576), the earliest work on grammaticalization goes back to the 18th century when fundamental insights of current grammaticalization theory were already mentioned.[5] These include the idea that grammatical elements such as tense affixes derive from concrete lexical entities, and that basic word classes such as nouns and verbs may give rise to other word classes such as prepositions, conjunctions, etc. In the 19th century, these insights became central to research within the domain of historical contrastive linguistics (including the works of A. W. von Schlegel and W. von Humboldt) which, in their reconstruction of earlier stages of particular languages, were of course also concerned with the search for regularities in the development of linguistic forms.[6] The actual notion of grammaticalization was introduced by Meillet in 1912 and, as is well-known, was defined as "l'attribution du caractère grammatical à un mot jadis autonome" ['the attribution of grammatical character to an erstwhile autonomous word'] (Meillet 1958: 131). His work already introduces many topics which would be elaborated in the subsequent century: The concept of analogy, the observation that morphemes can fuse, that lexical items may lose meaning and that word order may become fixed over time, that repetition and usage are responsible mechanisms of language change, etc. Meillet's theory was further developed by Kuryłowicz (1965), but the major

developments in grammaticalization theory took off in the 1970s with, for instance, the model of syntactic change proposed by Givón. This model, built around the idea that "today's morphology is yesterday's syntax" (Givón 1971: 12), accounts for frequently observed patterns of language change by proposing the following order: *discourse* > *syntax* > *morphology* > *morphophonemics* > *zero*.

In the 1970s and 1980s, grammaticalization theory was mostly concerned with phenomena of morphosyntactic change, and the unidirectionality hypothesis, according to which abstract and grammatical meanings straightforwardly derive from concrete lexical meaning, was not yet put into question (Lehmann 1985). The relatively homogeneous character of early grammaticalization theory was burst in the following years when different hypotheses concerning the role of semantics in language change, as well as the idea of (uni)directionality, came to the fore. Consequently, in the 1990s and at the beginning of the 21st century, grammaticalization theory was partially reformulated in order to account for pragmatically defined phenomena of language change, such as parentheticals (e.g., Brinton 2008) or discourse markers (e.g., Traugott 1995; cf. *infra* section 2.5), and more recently, the origins and developments of particular constructions (e.g., Hilpert 2013, cf. *infra* section 4). This long and intricate history of grammaticalization theory has been organized by Traugott (2010) in terms of two major approaches, defined as *grammaticalization as reduction and increased dependency* (section 2.2) and *grammaticalization as expansion* (section 2.5).

2.2 The Grammaticalization as Reduction View: Definition, Criteria, and Parameters

The traditional view defines grammaticalization processes in terms of freezing, reduction of elements, loss of stress, etc. It originated in research on morphological changes including the formation of affixes, clitics, and auxiliaries (cf. Andersen 2010), and was dominated by the idea that directional changes toward morphological fusion follow particular clines, paths, or chains. This reduction view comprises two major strands: one which defines grammaticalization mainly in terms of change in form, defining grammar as the combination of the levels of phonology, morphology, and syntax (cf. the theories of Lehmann and Haspelmath),[7] and one which considers grammaticalization as primarily caused by semantic change (for instance, in the work of Bybee 2003; Traugott & Dasher 2002; Hopper & Traugott 2003).

Within the formal view, the grammaticalization parameters as proposed by Lehmann (1985) have been most influential. According to his definition, grammaticalization is a process which "turns lexemes into grammatical formatives and makes grammatical formatives still more grammatical" (Lehmann 1985: 303).[8] His theory fits within the reduction view because its major interest lies in how univerbate, fixed, and routinized linguistic elements become over time. Its groundbreaking nature was mainly because, for the first time, grammaticalization was explicitly defined as a *set* of interacting phenomena responsible for *gradual* language change. As is shown in Table 18.1, the model includes six parameters which form a correlated set of syntagmatic and paradigmatic constraints, and relate to three levels of analysis, namely weight, cohesion, and variability of a linguistic item.

Table 18.1 Parameters of grammaticalization according to Lehmann

	Paradigmatic	*Syntagmatic*
weight	integrity	scope
cohesion	paradigmaticity	bondedness
variability	paradigmatic variability	syntagmatic variability

Source: Lehmann 1985: 305–307.

In concrete terms, grammaticalization as reduction is said to imply:

(1) Loss of *integrity*, meaning the semantic and phonological weight of a sign. This process is called *attrition* and involves both desemanticization and morphological degeneration; e.g., the French definite article *le* derives from the Latin demonstrative *ille*.
(2) Reduction of the structural *scope* of a sign. Through *condensation*, the scope of a linguistic sign shrinks. As a consequence, the constituent it combines with becomes less complex, and the sign itself may lose the ability to predicate over other signs. The Latin verb *habeo*, for example, lost its possessive meaning ('to have') and became an auxiliary verb in the evolution of the verbal periphrasis *habeo* + inf. as a deontic verbal construction in Romance languages, e.g., Fr. *avoir à* + inf., Cat. *haver de* + inf. or Sp. *haber de* + inf.
(3) *Paradigmaticization*, meaning that signs tend to form increasingly small but homogeneous paradigms; e.g., the creation of the auxiliary verbs *avoir* and *être* out of verbs of possession and being.
(4) An increase of *bondedness* or cohesion of a sign with other signs within a particular context, also called *coalescence* (i.e., juxtaposition of signs → cliticization → agglutination → fusion).
(5) Reduction of paradigmatic variability or *obligatorification*, meaning that the choice among members within a paradigm becomes more constrained; e.g., in Spanish when the direct object (DO) consists of an [+human] entity, the presence of the preposition *a* became gradually more required, even when the DO was not a highly specific entity: *He visto a unos niños* 'I have seen some children'.
(6) Reduction of syntagmatic variability or *fixation*, meaning that there is gradually less possibility of shifting around a particular sign; e.g., Latin's free word order became more fixed in Romance languages, e.g., Lat. *mente clara/clara mente* > Fr. *clairement*.

To illustrate, these criteria can be applied straightforwardly to the development of affixes with future and conditional meaning out of Latin infinitival constructions with *habeo* in most Central and Western Romance languages (cf. Coleman 1971). Originally, *habeo* was a syntagmatically free form with possessive meaning, which gradually underwent lexical and phonological attrition. As it became an abstract tense marker, it lost the initial *h*, and moved from the clause level to the verb phrase level, as an auxiliary, and finally to the word level, as an affix, reducing its scope. It increasingly bonded with other lexical items, became the obligatory affix for future tense, and was eventually integrated as part of the future tense paradigm.

At this early stage of grammaticalization theory, Hopper (1991) proposed an interesting series of principles of grammaticalization which underlie most current approaches. These include:

(1) *Layering*: For the expression of a particular function, languages can develop different resources at different times; different layers may coexist and interact.
(2) *Divergence*: Grammaticalized and original lexical forms may coexist in language but will most probably develop divergent functions.
(3) *Specialization* and narrowing of formal choices: A more reduced set of forms will assume more general functions.
(4) *Persistence*: (Semantic) characteristics of an original form may continue in the grammaticalized one.
(5) *Decategorialization* or loss of the original morphosyntactic capacities of a form, also referred to as freezing and bonding, or the loss of independent word status of a linguistic item.

It is interesting to note that several cross-linguistically valid grammaticalization processes have been observed. Within the domain of tense, aspect, and modality, for instance, it is observed that future

tenses frequently originate from motion schemas (e.g., *going to, gaan, ir a, aller* + inf. in English, Dutch, Spanish, and French, respectively) or volition schemas (e.g., *vrea* + inf. in Romanian or *will* + inf. in English). Within the nominal field, demonstratives may constitute the source of definite articles (cf. *supra* Latin *ille* > *le, el, il* in French, Spanish, and Italian, respectively); the numeral *one* is often cited as a source for indefinite articles.

Still, the grammaticalization as reduction view has faced much criticism concerning at least three basic tenets of the theory, namely the attention paid to semantics and pragmatics within the process (section 2.3), the question of unidirectionality (section 2.4), and the reduction view as such (section 2.5).

2.3 The Role of Meaning in Grammaticalization as Reduction: Contexts, Motivations, and Mechanisms

Besides describing the formal paths of grammaticalization, researchers were increasingly interested in the motivations behind these processes and the question of why these linguistic changes occurred. Hence increasing attention was paid to the functional meaning of grammaticalization, comprising different semantic and pragmatic accounts. These concerns were at the basis of the development of a true grammaticalization *theory*, defined as a theory that "offers an explanatory account of how and why grammatical categories arise and develop" (Heine 2003: 578). A distinction is made between motivations behind linguistic change (why does it occur?) and mechanisms of change (how does it occur?). As is illustrated below, the former refers to language users' wish to be innovative, creative, and to the economic principle of language (cf. *supra* section 1), whereas the latter comprehends crucial phenomena such as analogy and reanalysis.

The idea that grammaticalization generally applies to a set of semantically restricted elements is already present in Lehmann's theory, although in an embryo stage. It is referred to as the *channelization of grammaticalization*, meaning that "there is only a limited number of elements from among which new grammatical morphemes may be recruited" (Lehmann 1985: 312; see also *supra* section 2.2). In later work, many authors (such as Heine et al. 1991; Bybee 2003; Kuteva 2001; Traugott & Dasher 2002; Hopper & Traugott 2003) have increasingly focused on the role of metaphorical and metonymical processes underlying grammaticalization, also from a cross-linguistic and typological point of view. Recurrent paths of development of grammatical forms out of lexical items have been observed (e.g., Kuteva 2001 on auxiliaries). The generally accepted idea is that concrete meanings of lexical items are gradually eroding and becoming more general and abstract during grammaticalization, thus undergoing *semantic bleaching*. According to Heine et al. (1991: 48), these recurrent semantic shifts may be summarized as transfers following the order *person* > *object* > *activity* > *space* > *time* > *quality*. To give just one example, there appears to be a cross-linguistically valid relationship between locative deictic markers and body parts in that grammatical markers for *front* are often derived from body-part nouns for the face, the eye, or (a part of) the head, whereas markers for *back* are often derived from the body-part noun for the back. Consider for instance the Spanish adverbials *enfrente de* 'in front of' and *a espaldas de* 'behind (one's back)' which are derived from the body-part nouns *frente* 'forehead' and *espalda* 'back', respectively. According to these proposals, analogical (metaphorical) thinking, also called analogy,[9] would be the major driving force behind processes of language change such as grammaticalization (e.g., Heine et al. 1991; Fischer 2007).

Other models have mainly emphasized the pragmatic parameters or the specific contexts which enable grammaticalization. As has been stated before (cf. *supra* section 1), languages do not change by themselves; they change by the particular use that is made of them by language users. Grammaticalization is seen as the outcome of a long and complex process of conventionalization to which different motivations apply:

a. Speakers want to be expressive and creative (Lehmann 1985: 311–312), or even extravagant (cf. Haspelmath (1999: 1055): "Talk in such a way that you are noticed").
b. Semantic changes may lead to a mismatch between a certain form and its original meaning. The context becomes ambiguous for the hearer, who no longer knows which interpretation was intended by the speaker. However, the speaker probably wanted the hearer to consider different meanings.[10] This phenomenon is referred to as *invited inferencing* (Geis & Zwicky 1971; Traugott & Dasher 2002), or *pragmatic inferencing* in general. A repetition of such an inferential pattern may become conventionalized, may lead to a new analysis or reanalysis,[11] and thus change both the meaning and form of a linguistic item.

Repetition and high frequency of creative uses, new inferences, mismatches, etc. have often been referred to as the driving force behind the spread of a new linguistic trait (cf. Bybee 2003). However, subsequent questions relate to why some items become more frequent than others, or why grammaticalization does not always involve increased frequency (Hoffmann 2005).

2.4 Challenging the Hypothesis of Unidirectionality

A second major topic within the grammaticalization as reduction view has been the issue of directionality and, more particularly, the idea of "irreversibility of grammaticalization" (Haspelmath 1999: 1044) and fixed paths of grammaticalization (cf. for instance, Givón's model proposed in section 2.1). Many counterexamples to this "perpetual unidirectional passage" (Lehmann 1985: 313) have been described, seriously challenging Lehmann's statement that "[T]he converse movement almost never occurs". These counterexamples, which became the focus of attention of many theories at the beginning of the 21st century, imply changes from a more to a less grammatical status of linguistic items, from a bound to a non-bound status, or from a grammatical to a lexical status. An interesting case in point is the use of the possessive genitive suffix: Its restricted use as a clitic postposed to a noun (e.g., *Mary's book*) may extend to higher levels and as such move from the morphological to the syntactic level (e.g., *It's that girl's book* vs. *It's that girl I told you about's book* (Parrot 2010: 15)). Another example is the combined use of three grammatical units, namely the three prepositions *de*, *ex*, and *de*, leading to the new lexical item *desde* 'since, from' in Spanish. Such examples have been classified as cases of *antigrammaticalization* (Haspelmath 2004), *degrammaticalization* (e.g., Norde 2001: 236–237), or even *lexicalization* (Brinton & Traugott 2005; see also section 3).

As a natural consequence, the mantra of unidirectionality became more silent, but most researchers believe that those counterexamples do not need to undermine grammaticalization theory. It was observed that processes of degrammaticalization constitute relatively isolated cases, do not involve fixed paths or allow for cross-linguistic generalization, as opposed to most cases of grammaticalization, as has been shown in the preceding paragraphs. As an explanation for their (rare) occurrence, reference has been made to specific "social, psychological and cultural conditions shaping language use" (Heine 2003: 582). In some languages, for instance, sexual body parts are indicated by originally grammatical terms of deictic spatial orientation. So instead of using a lexical term, speakers refer to 'the thing in front' or 'the thing below'. The degrammaticalization of a preposition into a lexical word would be due to cultural norms disallowing to talk about sexual body parts in an explicit way.

Norde (2009) identifies three rare types of degrammaticalization: (1) *degrammation*, meaning that members of minor word classes are reanalyzed as members of major ones; e.g., preposition > verb: *to up the internet*; (2) *deinflectionalization* or the process through which inflectional affixes gain new functions but are still bound; e.g., the shift from the genitive singular suffix *-s* into a clitic possessive in English; and (3) *debonding* through which bound morphemes become free; e.g., the Norwegian clitic infinitival marker *å* which has become a free morpheme.

Another interesting case in point is *exaptation*, a notion from the domain of evolutionary biology, which was introduced in linguistics by Lass (1990) at the end of the 20th century. Lass defined exaptation as "the opportunistic co-optation of a feature whose origin is unrelated or only marginally related to its later use" (Lass 1990: 80). According to Lass's proposal, exaptation applies to linguistic forms that have evolved into a kind of linguistic *junk*, but instead of disappearing, they were recycled for a new linguistic purpose. A frequently cited example is the Latin neutral plural ending *-a* recycled, for instance, in Italian as a plural morpheme with collective meaning, as opposed to the regular plural morphemes; e.g., Latin *cornu* (neuter SG) → Latin *cornus* (masc. SG) → It. masc. SG. *corno* 'horn' → It. masc. PL *corni* 'horns' vs. Latin *corna* (neuter PL) → It. fem. PL *corna* 'the two horns of an animal' (Giacalone Ramat 1998).[12] However, the concept *exaptation*, as defined by Lass (1990), became a controversial notion in linguistics; the idea that forms such as the plural ending *-a* would be morphological junk has been discussed. Thus, when at the beginning of the 21st century linguists came back to the concept, they only concentrated on the idea that exaptation accounts for unpredictable cases of refunctionalization of linguistic material. For instance, Wall and Octavio de Toledo (2016) present as a case of exaptation the evolution of the Spanish definite article at the head of completive *that*-clauses; e.g., *Yo, ni niego, ni afirmo el que en este género de letras tenga […] algún razonable o moderado caudal* 'I neither deny nor confirm that I might have any reasonable or even average talent for this kind of study' (see also different contributions in Norde & Van de Velde 2016).

2.5 Grammaticalization as Expansion

A final aspect of the traditional view which has been put into question is whether grammaticalization implies reduction at all levels. The *grammaticalization as expansion* view implies two phenomena which do not fit the model described under section 2.2, namely (1) contextual expansions as a result of grammaticalization of linguistic elements, and (2) the particular behavior of discourse markers.

First, in processes of semantic bleaching and decategorialization inherent to auxiliary formation, linguistic items originally used in lexically specific contexts may be used in new contexts. For instance, movement verbs which mainly require human subjects can extend to inanimate subjects when used as an auxiliary in a periphrasis, e.g., *John/*the house goes → John is going to eat/The house is going to be built*. This insight has been at the basis of more construction-based theories of grammaticalization in which the isolated element-based view is denounced (e.g., Diewald 2002; Heine 2002). As an alternative, Himmelmann (2004: 31) proposes that it "is the grammaticizing element *in its syntagmatic context* which is grammaticized. That is, the unit to which grammaticization properly applies are *constructions*."[13] Three types of possible expansion are identified:

(1) The construction internal concept of *host-class expansion*, meaning that in a process of grammaticalization, the grammatical item becomes increasingly compatible with more classes of elements; e.g., the above-mentioned example of auxiliary verbs which extend toward inanimate subjects.
(2) *Syntactic context expansion*, which refers to the extension of the syntactic contexts in which a particular construction is used; e.g., when definite articles are grammaticalized out of demonstratives, they first occur in core argument positions, but gradually extend to other syntactic contexts.
(3) *Semantic-pragmatic expansion*, meaning that grammaticalized items are increasingly used in more varied semantic and pragmatic contexts.

Himmelmann's account has led to a better comprehension of the notion of *linguistic productivity*—and more specifically, increased token and type frequency (Bybee 2003) and collexemic frequency

(Stefanowitsch & Gries 2003)—as a concomitant to grammaticalization and constructionalization (cf. *infra* section 4).

Secondly, the central focus on gains instead of losses is also observed in grammaticalization studies of pragmatic markers (e.g., *well, look*, etc.), connectives (e.g., *because, however*, etc.), and parentheticals (e.g., *I mean, you know*, etc.). In earlier grammatical theories, these items and structures were considered to be outside the core grammar, at a separate higher discourse level. However, within the framework of cognitive linguistics, the definition of what grammar really is radically changed and included semantics and pragmatics. Consequently, since the mid-1990s, increasing attention has been paid to spoken (informal) language phenomena.[14]

Authors such as Erman and Kotsinas (1993) and Aijmer (1997) perceived many similarities between traditional cases of grammaticalization (as defined in section 2.2) and the development of pragmatic markers and the like: Principles and notions such as layering, divergence, persistence, fossilization, decategorialization, and loss of formal integrity mostly apply to the development of pragmatic markers (e.g., Vincent et al. 2009 on *you know*). However, the use of these linguistic items does not involve a loss of semantic integrity (although there is semantic bleaching), but a gain of pragmatic functions and procedural meanings. They do not involve a reduction of structural scope and syntagmatic variability, but expansion as they can reach a whole turn or utterance, or parts of them, and occupy many different positions at various discourse levels (Beeching & Detges 2014). Because of these crucial differences, Erman and Kotsinas (1993) and later Dostie (2004) named the linguistic processes by which pragmatic markers, connectives, and parenthetical markers are formed, cases of *pragmaticalization*.

Still, it has been argued by Traugott (2003) that the terminological debate (grammaticalization vs. pragmaticalization) relates to how one defines grammar. A broader conceptualization of grammar—like the one of cognitive linguistics—which goes beyond the morphosyntactic level and includes pragmatic functions, makes the notion of pragmaticalization to some extent redundant. As a consequence, many authors (e.g., Diewald 2011) have chosen to use the term grammaticalization as a kind of umbrella term to refer to any change, independently of the classes (morphemes, clitics, auxiliaries, pragmatic markers, etc.) involved or the direction of the change, toward reduction or expansion (see also Degand & Evers-Vermeul 2015).

2.6 Grammaticalization: The Limits

As discussed earlier, grammaticalization is not a uniform concept, as it is stated in Narrog and Heine (2011: 2). Some definitions rely on the morphosyntactic changes experienced by the word or the construction that grammaticalizes, whereas others focus on the pragmatic side of the process of change. However, rather than being two different approaches, the differences relate to the kind of phenomena of language change that is studied. For instance, the rise of a verbal ending or of an auxiliary verb from a lexical verb highlights the grammatical side of grammaticalization. On the contrary, if one focuses on the development of discursive markers, the pragmatic view will be underlined. Given this situation, it is not surprising that many different definitions of grammaticalization have been proposed (Narrog & Heine 2011: 2). Thus, the basic idea shared by most of the studies is that grammaticalization is related to Meillet's definition: Grammaticalization is concerned with the evolution from lexical words or more complex constructions to grammatical structures. The problem arises when the border with other types of change blurs, as Winter-Froëmel (2014: 509) points out:

> Summing up, we can see that traditional definitions of grammaticalization strongly diverge, emphasizing either the endpoint of the change (e.g., grammatical items) or its directionality. At the same time, there is a tendency to include more and more phenomena under this label, which has, as we will see, immediate consequences for the way

in which grammaticalization should be distinguished from other types of change (e.g., pragmaticalization, lexicalization).

Different studies have been published following the idea of Winter-Froëmel (cf. the contributions in Pons & Loureda 2018).

3. Lexicalization

Lexicalization has often been considered as the antipode of grammaticalization. Lexicalization has been defined by Traugott (2010: 276) as "the use of a syntactic string or word-formation as a new contentful form that is semantically not fully compositional and is relatively idiosyncratic". The outcome of the process is a new lexical (instead of grammatical) item, as, for instance, the creation of the Spanish noun *el porqué* 'the reason' out of the conjunction *porque* 'why'. The processes of grammaticalization and lexicalization have long been considered as changes of lexical into grammatical items and changes of grammatical items into lexical ones, respectively (e.g., Lehmann 1989). However, the relationship between the two phenomena has not always been clear.

Himmelmann (2004: 27) distinguishes at least five interpretations of the term lexicalization, among which the most important ones are the following:

- A new lexeme is created out of two or more lexical items through univerbation and fossilization; e.g., composite nouns such as *skyscraper*, blends such as *workaholic*, abbreviations such as *Interpol* < international police, and idiomatizations as in *When pigs fly*.
- A new derivational pattern emerges; e.g., the suffixes *-ly, -ment(e), -dom*.
- A grammatical item is used in places where normally one would expect a full lexical item; e.g., preposition *up* used as a noun in *the ups and downs*.

However, notice that the latter cases have also been proposed as illustrative of degrammaticalization, as they contradict the unidirectionality principle, as proposed in section 2.4, what would then equate lexicalization with degrammaticalization. However, once the idea of unidirectionality was abandoned, lexicalization was seen as a type of linguistic change in its own right. Despite the many parallels between grammaticalization and lexicalization, such as the idea of gradualness of the linguistic change, fusion, and coalescence of items, the main difference consists, among others, in the absence of decategorialization, bleaching, and increase of collexemic, token, and type frequency in the case of lexicalization (Brinton & Traugott 2005: 110).

The major problem has been that it is not always clear what is to be considered as part of the lexicon or not. There is, for instance, a discussion on whether derivational morphemes (e.g., the Latin *mens* which has given rise to the adverbial Romance suffix – *mente*) should be classified as pertaining to the lexicon, given that they have some inherent semantic meaning, or grammar, because they are to various extents productive, like grammatical categories in general are. Consequently, the emergence of derivational morphemes has been defined as both grammaticalization (Hopper & Traugott 1993) and lexicalization (Lehmann 1989). To solve this issue, different solutions have been proposed.

For some authors (e.g., Anttila 1989), the two processes are parallel and mutually dependent: The grammaticalization of a linguistic item leads to the creation of a new lexical item and thus involves lexicalization. Also, in cognitive-functional theories, no clear-cut distinction is made between grammar and lexicon, which are defined in terms of a continuum. Therefore, an approach in terms of prototypicality has been proposed and concrete cases are said to be closer to the one or the other process.

An important contribution to this discussion is the theory proposed by Himmelmann (2004). What both processes of linguistic change share is that they are products of conventionalization: Particular combinations or expressions become gradually more widely used (cf. *supra*

section 2.3). The main difference relates to the concept of productivity: Grammaticalization is mostly defined in terms of expansion (cf. section 2.5), whereas lexicalization implies that items' ranges are reduced when entering special collocations. Expressions acquire "unanalyzable unit status", may present "morphosyntactic idiosyncrasies" as they are gradually treated as single processing units, and become less widely applicable (Himmelmann 2004: 35–36). Moreover, lexicalization is said to apply only to specific individual items, whereas grammaticalization mostly involves a broader set of items.

The above-mentioned notion of linguistic productivity is also a key concept in a more recent account of linguistic change which has shifted the attention from item-based changes to the development of fixed patterns or constructions. This approach is further elaborated on in section 4.

4. Constructionalization

4.1 Construction Grammar: The Basics

The construction grammar framework was developed in the mid-1980s through the research by Fillmore and Kay (e.g., Fillmore 1988; Fillmore & Kay 1997). These authors considered grammar to consist of symbolic pairings of form and meanings which cannot be deduced from the meaning of the individual words. Early studies focused on the analysis of idiomatic expressions such as *let alone* (Fillmore et al. 1988), but the analysis rapidly extended to grammar in general. Hence Goldberg (2006: 5) defined grammatical constructions as pairings of a form with a semantic or pragmatic function "including morphemes or words, idioms, partially lexically filled and fully general phrasal patterns". These constructions are stored in the *constructicon*, a language inventory structured according to different levels of schematicity (cf. Traugott & Trousdale 2013; Traugott 2015). Some constructions, called schemas, are minimally saturated constructions, e.g., the schema [causative construction]. These schemas can be concretized in more specific subschemas. The schema [causative construction], for instance, accommodates subschemas such as [PUT X TO Y] or [DO X – Y]. Subschemas are further concretized in substantive and item-specific grammatical constructions, called *micro-constructions*. The subschema [PUT X TO Y] is instantiated for instance by the micro-construction *Put the water to boil*. Finally, micro-constructions used in concrete utterances are called *constructs*. The constructions are therefore organized in hierarchical networks with inheritance, polysemy, and synonymy relations.

It is important to highlight that the constructicon includes both lexical and grammatical constructions. Consequently, unlike other approaches to the study of language, construction grammar defends a continuum between lexicon and grammar. Lexical constructions present "contentful and referential semantics: They are naming strategies" (Traugott 2015: 54), whereas grammatical constructions "have primarily procedural, linguistically relational and non-referential semantics. They are relational strategies" (Traugott 2015: 54). In this way, the study of lexicalization and grammaticalization can be carried out within a more holistic theory of linguistic change. Thus, construction grammar follows the same approach as cognitive-functional models for which there is no strict division between lexicon and syntax: The distance between lexicon and grammar is understood in terms of a gradual continuum in clear opposition to the notion of modularity proposed by formalist approaches.

4.2 Constructionalization and Linguistic Change

From the beginning of the 21st century onwards, there have been proposals to study diachronic variations from the perspective of construction grammar. In her article "Construction Grammar as a tool for diachronic analysis", Fried (2009) demands a space for this framework in the terrain of historical linguistic analyses. Rostila (2004) and Noël (2007) had already coined the term

constructionalization, in clear parallel with the notion of grammaticalization. If grammaticalization is concerned with the study of the creation of grammar, constructionalization is concerned with the study of the creation of grammatical constructions.

The differences between grammaticalization and constructionalization are not profound (cf. Traugott & Trousdale 2013; Traugott 2015). The idea that grammatical change occurs in constructions goes back to Meillet himself and already appears in the first edition of Hopper and Traugott's monograph on grammaticalization (1993, 2003) (see *supra* section 2.1).[15] However, these early constructional analyses have focused either on the semantics of the linguistic change or on its morphosyntactic repercussions (see *supra* sections 2.1, 2.2, and 2.3). Therefore, one of the main differences between grammaticalization and constructionalization theories is that the latter pays equal attention to change in meaning, i.e., semantics, pragmatics, and discursive functions of grammatical constructions, and change in form, i.e., modifications affecting the syntax, morphology, and phonology of construction. This equal interest in form and meaning allows the gradualness of changes to be measured out more accurately.

Diachronic construction grammar is interested in how new pairings of form and meaning arise. Following Traugott and Trousdale (2013), grammatical change can be of two types, namely constructional change or constructionalization. Constructional change involves a modification of a meaning or form aspect of the pattern; constructionalization occurs when a new pairing of form and meaning emerges, meaning the development of a new grammatical construction. A constructional change is either a previous stage leading to the emergence of a new form-meaning pairing, or it occurs after constructionalization, leading to further grammatical changes (post-grammaticalization). Another interesting aspect is that constructionalization theory is concerned as much about grammatical change (section 4.2.1) as lexical change (section 4.2.2).

However, constructionalization is much more than a reformulation of grammaticalization's principles. The (re)introduction of the theoretical notion of construction and its application in the field of diachrony, among other things, has opened up the possibility of measuring with greater precision the gradualness of the grammatical change. Constructionalization allows the accurate determination of whether a given evolution consists of a semantic change, a syntactic change, or a combination of semantic and syntactic change at the same time meaning the emergence of a new construction in language.

4.2.1 Grammatical Constructionalization

The previously introduced concepts of constructional change and grammatical constructionalization can be illustrated through the development of the future time values of the construction *ir a* + inf. in Spanish, which parallels the development of the English *be going to* + inf. (see Traugott 2015). *Ir* 'to go' is a deictic verb expressing movement that starts at the speaker's position. This movement is directed toward a place indicated by a prepositional phrase introduced by the preposition *a* 'to' (e.g., *ir a casa* 'to go (to) home'). Occasionally, the sequence *ir* 'to go' + LOCATIVE is complemented by a phrase expressing the goal of the movement (e.g., *ir a casa a dormir* 'to go home to sleep'). If in a next phase of the development, the locative complement is omitted, the goal meaning is activated and projected toward the future (e.g., *ir a dormir* 'to go to sleep'). Initially, the inference of a future temporal meaning is not clearly differentiated from the spatial meaning (see example (1) which is ambiguous between the readings of going to a place to fight, and future time 'I am going to fight against you'). However, the future value ended up being grammaticalized through a process of change affecting all features of the construction.

(1) & sepas que *vo* yo *lidiar* contigo. (Anonymous, *Bocados de oro,* 13th century)
'And you must know that *I am going to fight* against you.'

The first example in which *ir a* + inf. clearly expresses the future time (2) preserves the syntax of the etymological construction with *ir* as a motion verb. At that point, a constructional change arises, creating a mismatch in the pairing between the form *ir a* + inf. and the meaning of going to a place to do something. Indeed, the motion sense, in some contexts, is already evolving toward the future tense meaning. The syntax, however, is not yet affected by this process. The arguments subcategorized by the verb *ir* continue to be [+animate] entities in the case of the external argument, and activity verbs in the case of the infinitives (e.g., *to give*, *to fight*, *to throw*). No important formal modifications are observed, except for the vacillation in the use of the preposition *a* between the auxiliary verb and the infinitive, which for a few centuries can appear (2) or not (1).

(2) E si quisieres que sea bien de ti e de tu linage después, e que dures tú mucho tiempo señor sobre la tierra que Dios te *va a dar*, guarda estos mandados. (Alfonso X, *General estoria I*, 13th century, Gradia)
'And if you want you and your lineage to live well and if you want to be lord over the land that *God will give you* for a long time, keep these commandments.'

Gradually, the semantic evolution also triggers syntactic changes that further motivate the readjustment of the form-meaning pairing. The first symptom of this formal change involves the appearance of new lexical collocates in the position of the infinitive. Thus, in addition to activity infinitives (1–2), state verbs (3) as well as impersonal or meteorological verbs (4) are documented since the 16th century. These verbs are no longer compatible with the physical movement reading of *ir a* + inf.

(3) a. De manera que muestras bien cuánto cuidado tuviste de parecer a aquel gran Dios de quien *vas a gozar*. (Juan de Valdés, *Diálogo de Mercurio y Carón,* 13th century, Gradia)
'As a consequence you show very well how much you tried to act like the great God whom *you are going to enjoy*.'
b. *va a haber* aquí una yeción. (Benito Pérez Galdós, *Fortunata y Jacinta. Dos historias de casadas*, 19th century, Gradia)
'There is going to be a mess here.'

(4) Sí que *va a llover*, dijo Rita. (Fernán Caballero, *La familia de Alvareda,* 19th century, CORDE)
'Yes, it's going to rain, said Rita.'

(5) el cuerpo […] luego me *va fallir*. (Pedro López de Ayala, *Libro de Palacio*, 14th century, Gradia)
'My body is going to break down.'

There are also changes that affect the type of subject: From the 14th century, inanimate subjects are allowed (5), and in the 19th century zero subjects are found (4, 3b). These subjects confirm the consolidation of the future time meaning of the *ir a* + inf. construction. This set of accumulated small steps allows the emergence of a future time periphrasis and emphasizes that constructionalization is strongly dependent on the syntactic context in which the construction operates. Moreover, when comparing the etymological construction and the future time periphrasis, the reanalysis of the hierarchy of constituents experienced by the initial construction becomes evident: (1) the verb *ir* no longer functions as the main verb and has ceased to subcategorize the arguments; (2) the preposition *a* no longer introduces a prepositional phrase but has become a nexus between the two verbal forms of the periphrasis; (3) the verb in the infinitive becomes the main verb in the construction. At this point, a new meaning is associated with a new form, and thus, a new construction emerges. After this pattern is formed, a new constructional change occurs when the periphrasis undergoes modifications affecting its phonetics and consisting in the reduction of form

(*post-constructionalization*). Indeed, the sequence *te voy a dar* [te βój a ðáɾ] is pronounced as [tiβjaðáɾ] in informal conversational speech.

Because of the hypothesis that the constructicon is organized at different interconnected schematicity levels, diachronic changes can be studied at the more saturated levels, i.e., those of micro-constructions and constructs, but also at the more schematic ones. The analysis of the rise of the Spanish differential object marking illustrates this methodological benefit. The new macro-construction consists of a transitive verb followed by a DO consisting of a prepositional phrase introduced by the preposition *a* 'to'. This construction mainly applies to DOs that refer to specific human entities—sometimes also specific animated entities, like animals—(e.g., *Encontré a María en el supermercado* 'I met (to) Mary at the supermarket'), but it gradually extends to non-animated entities (e.g., *Vi al camión de la basura* 'I saw (to) the garbage truck'). The emergence of this macro-construction started in the Middle Ages with new constructs that employed the preposition *a* to mark DOs consisting in tonic personal pronouns (e.g., *Te vi a ti* 'I saw (to) you'). These constructs spread until they generated a new pairing of form (transitive verb + prepositional direct object) and function (the expression of specific DOs, mainly if they refer to human beings). In a nutshell, it was very specific new constructs which allowed for the emergence of a new macro-construction.

Likewise, constructions are not only connected vertically but also horizontally, meaning that there are relationships between constructions situated at the same level of schematicity. Consequently, a particular set of micro-constructions can motivate the emergence of new schemas and subschemas. Indeed, *supporting constructions* can motivate the appearance of other schemas that follow their model (De Smet & Fischer 2017). This kind of analogy explains the rise of some verbal periphrases. For instance, the Latin periphrasis of obligation *habere* + inf. 'to have to' evolved into the Spanish synonymous verbal periphrasis *haber de* + inf. This construction was the supporting construction for the emergence of a new grammatical construction, *tener de* + inf. 'to have to'. The new periphrasis resulted from the synonymy between *haber* 'to have' and *tener* 'to have' in their uses as lexical verbs. Speakers extended this synonymy to grammar and, as such, *tener* acquired a non-referential meaning as an auxiliary verb.

The idea that the constructicon is organized in different levels of abstraction allows to explain the existence of different constructions related to a similar form. For instance, in Spanish, the construction made of the combination of the verb *ir* 'to go', the preposition *a* 'to', and an infinitive (*ir a* + inf.) not only expresses the future tense (5) but also functions as a focus marker (6) (see Bravo 2014).

(5) *Te va a gustar.*
'You will enjoy it.'

(6) a. *Fue a llover* el día de mi boda.
'Of all the days of the year, it had to rain my wedding day.'
b. *Fue a aparecer* en el peor momento. (NGLE: § 28.8j, Bravo 2014: 205)
'Of all of the moments of the day, s/he had to appear at the worst moment.'

The assertion that a construction is a sign in the sense of Saussure does not mean that complex constructions such as verbal periphrases act the same way as lexical words. The apparent polysemy of complex constructions often hides different constructions. For instance, the Spanish schema *ir a* + inf. instantiates at least two different subschemas: the one meaning future tense (5), and the other one in which *ir a* + inf. is a scalar focus marker (6), which introduces the worst of all the circumstances you can imagine (Bravo 2014: 203). Differences between future and focalizer construction are not only semantic but also syntactic, as both imply a different pairing of form and meaning. The future tense construction only allows for the verb *ir* 'to go' to be conjugated in the present tense (*va* in example 5) and the focus marker construction mainly appears with the verb *ir* in

the past tense (*fue* in example 6). In addition, the focus marker construction demands a constituent to be focalized. That explains why the focus marker can never appear without a constituent on focus and why (7) does not sound as natural as (6a–6b) (see Bravo 2014), even if Spanish is a language with flexible word order. Finally, the future construction does not show any restrictions for verbs in the position of the infinitive, whereas the focus marker constructions seem to be restricted to verbs with a negative semantic nuance in the context in which the focus marker construction is employed.

(7) *El día de mi boda fue a llover.
'It rained on my wedding day.'

4.2.2 Lexicalization from a Constructional Perspective

Diachronic constructional studies on lexicalization mainly focus on the creation and development of idiomatic structures such as *to give somebody a talking to*, *to give somebody a kicking*, *to have a shower*, or in other languages such as Spanish, *venir en gana* 'to have the desire'*, dar la campanada* 'to surprise everybody', *dar la charla a alguien* 'to scold someone'. These are expressions with a non-compositional meaning but with partial grammatical properties. Brinton (2008) claims that in idioms such as *to give somebody a kicking* or *to have a shower*, *give* and *have* function as light verbs adding grammatical meaning to their lexical one, as they function as markers of telic, end-point oriented, aspect.

These lexical constructions often result from the obsolescence of a constructional subschema becoming fixed in language (see Salas-Alba 2019). Their emergence is the result of a gradual reanalysis (or *neoanalysis*, following Traugott &Trousdale 2013) of the form and meaning of a construction. Thus, lexical constructionalization involves loss of semantic compositionality of the original expression, as well as loss of the syntactic analyzability.

The Spanish idiomatic expression *darle la charla a alguien* 'to scold someone', for instance, does not occur before the 20th century. The etymological construction has a quite compositional meaning: *dar una charla* means 'to give a talk, to speak before an audience about a scientific topic'. The verb *dar* 'to give' is not used in its basic sense of transferring a physical object to a person (as in *darle algo a alguien* 'to give someone something'), but in the figurative sense of transferring knowledge. The telic aspect of the literal uses of the verb is inherited by the lexicalized construction. Through a metonymic process, the construction acquires a negative sense: *dar la charla a alguien* (lit. 'to give the talk to someone') means 'to scold someone'. The semantic neoanalysis or reanalysis takes place as a consequence of a new interpretation of what 'to give a talk' can mean: Conferences may not be so interesting and can even be boring or disappointing. The process of change also involves syntactic reanalysis as *dar la charla* becomes a fixed structure: The verb *dar* does not select as a DO *charla*, but the set *dar la charla* forms a composite unit in which only the definite article may alternate with an indefinite one in order to express a high degree of intensity (*dar una charla a alguien* means 'to scold somebody a lot'). On the contrary, the noun *charla* does not allow for any modification; it only appears in singular form and only allows for complements intensifying the idea of scolding: *me dio la charla del siglo* '(s)he scolded me a lot'.

5. Current Issues and Future Directions

Despite the broad literature on grammaticalization, lexicalization, and constructionalization, there are still several issues which must be addressed in future work in the field. First, a number of interesting studies have focused on language change as the outcome of language contact (Heine & Kuteva 2005; Mithun 2008; Palacios & Pfänder 2018). According to this approach, grammaticalization processes may be activated in contact language contexts, foregrounding the crucial role

played by analogy. This line of research has not yet been explored to its full potential. However, there is evidence that contact with a construction in a language A, acting as a supporting construction, motivates the development of new meanings of a similar construction in a language B.

Second, the constructionalization approach has only been developed recently. Therefore, there are a few issues which need to be resolved, and numerous central topics are still being discussed. For instance, there is no consensus about the exact status of constructional changes and constructionalization. Boye and Harder (2012: 35–36) suggest that there is a difference between the two concepts without providing any concrete definition. According to Traugott and Trousdale (2013), constructional changes may occur both before and after constructionalization has taken place: They prepare the emergence of a new construction or contribute to the further adjustment of form to content. However, other studies are critical of this view. Hilpert (2018) points out that there is no evidence of how many constructional changes are needed before a new construction may emerge. Smirnova (2015), for her part, considers that constructionalization precedes constructional changes. Given the centrality of these notions for diachronic construction grammar, the debate should lead to a consensus. Moreover, the major bulk of work has focused on cases of grammatical constructionalization, leaving lexical constructionalization largely unattended.

Finally, studies on language change would benefit from a more intensive quantitative perspective, for instance, through the application of sophisticated statistical techniques (e.g., as in Rosemeyer & Garachana 2019). Given that theories such as grammaticalization and constructionalization are usage-based approaches to the study of linguistic change, frequency plays a central role. Especially the operationalization of the central notion of linguistic productivity should receive more attention in future work.

Notes

1 A search for the entry *grammaticalization* in the database of the MLA International Bibliography provides no less than 2,770 results with an increase of 80 published articles in the 1980s, and over 1,200 records in the current decade. The term *lexicalization* returns 440 records and follows a comparable chronological path. The entry *constructionalization* provides only 21 references, but all have been published between 2012 and 2019. These data show that the discussions of grammaticalization and lexicalization go hand in hand, and are still of topical interest. The theory of constructionalization has entered the scene more recently, as is shown in this chapter.

2 The most widespread term *grammaticalization* interchanges with *grammaticization* (Himmelmann 2004) and *grammatization* (Matisoff 1991).

3 However, it is important to point out that, even if most of the work on grammaticalization has been developed within the cognitive-functional approach, recently, grammaticalization has aroused the interest of formal linguistics as well (cf. van Gelderen 2011 for a general overview).

4 Unfortunately, due to space limits, it will not be possible to discuss many of the highly interesting alternative viewpoints and concrete case studies. Also note that relatively more space is dedicated to the notion of grammaticalization than to lexicalization and constructionalization. This apparent imbalance is because these two notions are also best defined against the background of grammaticalization (see also note 1).

5 A distinction should be made between grammaticalization, which refers to specific phenomena of language change, and grammaticalization theory, which aims to describe and explain different related phenomena (cf. Heine 2002; cf. *infra* section 2.3).

6 However, two important differences between the two approaches can be observed. First, although cross-linguistic patterns of grammaticalization have recurrently been observed, grammaticalization theory is not mainly concerned with comparing languages. Second, linguistic meaning constitutes an important part of most grammaticalization studies, whereas the historical comparative method is mainly concerned with formal aspects of language change.

7 This is clearly illustrated by the definition proposed by Haspelmath (2004: 26) according to which grammaticalization is "a diachronic change by which parts of a constructional schema come to have stronger internal dependencies". Note that this definition may have contributed to the constructional view on language change (cf. *infra* section 4).

8 In those early theories, a distinction has been made between primary and secondary grammaticalization, the former referring to changes from lexical to grammatical, and the latter from grammatical to more grammatical (e.g., Givón 1991: 305; see also Traugott 2002). More recently, the necessity of adding secondary grammaticalization as a separate notion has been put into question (e.g., Breban 2014; see also Detges & Waltereit 2002; and Waltereit 2011).

9 However, note that the term *analogy* is far from uncontroversial, and has received different definitions. In Meillet's theory, for instance, analogy refers to the phenomenon which explains morphological regularization, and has no relation whatsoever with the semantic interpretation of the term.

10 These ambiguous contexts have been termed *bridging contexts* or *switch contexts* by Heine (2002: 590): A > A, B > B.

11 Parallel to the term *analogy*, the notion of *reanalysis* has been the subject of discussion. In general, it has been associated with a change in parsing of an expression. According to Hopper and Traugott (1993), all cases of grammaticalization involve reanalysis, but not all cases of reanalysis involve grammaticalization. Haspelmath (1998), on the contrary, believes that grammaticalization and reanalysis are two different phenomena, and that only some instances of grammaticalization are reanalysis and vice versa. Heine (2003: 593) proposes not to use the term analogy in discussions on grammaticalization because of possible misunderstandings.

12 Similar cases have been accounted for in terms of *degrammaticalization* (Heine 2003) but are now generally seen as instances of a process of language change in their own right.

13 The emphasis is ours. Of course, this insight has significantly contributed to the development of the constructionalization theory, as explained in section 4 below.

14 On the other hand, attention has also been paid to the grammaticalization that takes place in the written text (Narrog & Ohori 2011).

15 Meillet stated that "le seul procédé qui reste [la grammaticalization] est l'atribution progressive d'un rôle grammatical à des mots autonomes ou à des manières de grouper les mots" (Meillet 1912: 132) ['the only remaining process [grammaticalization] is the progressive assignment of a grammatical role to autonomous words or ways of grouping words']. And Hopper and Traugott in the presentation of their book assessed that "grammaticalization [is] the process whereby lexical items or constructions come in certain linguistic context to serve grammatical functions" (Hopper & Traugott 1993).

Further Reading

For a comprehensive introduction to grammaticalization, the monographs by Hopper & Traugott (1993, 2003), Heine et al. (1991), and Bybee et al. (1991) are most valuable, as well as Narrog & Heine (2011) which offers the most complete overview of grammaticalization. Brinton & Traugott (2005) is still an interesting handbook on lexicalization. For a comprehensive introduction to constructionalization, see Traugott & Trousdale (2013). Fried (2009), Hilpert (2013), and the articles included in Coussé, Andersson, and Olofsson (2018) offer a series of concrete applications of the framework.

Related Topics

construction grammar and frame semantics; cognitive linguistics and language evolution; diachronic construction grammar

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INTERSUBJECTIVITY AND INTERSUBJECTIFICATION

Lieselotte Brems

1. Introduction

Intersubjectivity is often defined with respect to or even as being dependent on the notion of subjectivity, which refers to the linguistic expression of speaker involvement via lexical, grammatical, and/or construal choices. Intersubjectivity, then, in a very general sense, crucially highlights the hearer/addressee (as well as, or rather than, just the speaker). However, whereas the study of subjectivity has recently received a lot of attention (see De Smet & Verstraete 2006), intersubjectivity has received relatively little explicit attention in its own right, in the sense of a critical survey of the available definitions and recognition criteria (but see Davidse et al. 2010; Brems, Ghesquière, & Van de Velde 2014). Intersubjectivity appears in various linguistic fields and (synchronic and diachronic) frameworks, which, however, sometimes use conflicting definitions, which may cover quite different phenomena. In grammaticalization research, for instance, Traugott (2010) has mainly defined intersubjectification as a secondary process, potentially following the much more common process of subjectification, and has restricted it to the—fairly rare—emergence of politeness markers, such as honorifics in Japanese (Traugott & Dasher 2002: 263– 276) (see section 4.2). From a cognitive grammar perspective, Verhaegen (2005), on the other hand, has argued that intersubjectivity is omnipresent and involves the coordination of cognitive systems between speakers and hearers, thereby constituting the very basis of discourse, and even a precondition for language use. Since some constructions highlight this type of coordination more than others, they can be said to be more intersubjective than others, e.g., negation patterns or adversative connectors. Confusingly perhaps, Traugott (2010) would qualify the latter constructions as being subjective, rather than intersubjective. Finally, there are also more applied approaches (e.g., Hunston & Thompson 2000; Hyland 2005) which use such notions as appraisal, stance, or metadiscourse, and which seem to partially overlap with both subjective and intersubjective notions. In their approach, hedging and text organization might be considered intersubjective.

This chapter aims to give an overview of, and a possible way out of, the terminological confusion relating to intersubjectivity and intersubjectification. Important questions to be addressed are the following. Are intersubjectivity/intersubjectification independent concepts, or do they depend on subjectivity and subjectification? It is, for instance, generally assumed that diachronically intersubjective meanings develop later than and typically derive from subjective meanings. Can we distinguish subtypes of intersubjectivity, similarly to De Smet and Verstraete's (2006)

classification of types of subjectivity? Is intersubjectivity primarily a semantic notion, or can we find formal correlates? What semantic and/or formal parameters are there for intersubjectivity and intersubjectification? Following Brems, Ghesquière, and Van de Velde (2014), it will be suggested to define intersubjectivity independently (from subjectivity). Different subtypes of intersubjectivity will be discussed, i.e., attitudinal, responsive, and textual intersubjectivity. In addition, the possibility of defining systematic formal correlates of intersubjective meaning as well as the necessity of intersubjectivity developing unidirectionally from subjectivity will be assessed.

2. Historical Perspectives

The term intersubjectivity has received many interpretations and definitions in different linguistic frameworks, which have accordingly been used to capture sometimes very divergent phenomena. In the literature, there seem to be three main notions of intersubjectivity, namely Traugott's, who essentially has a diachronic approach linked to grammaticalization, Verhagen's notion, which is grounded in the theory of Cognitive Grammar, and Nuyts's understanding of it in terms of shared meanings.

Traugott's notion of intersubjectivity is perhaps the most widespread one and is typically understood to refer to meanings coding attention to the social self of the hearer (e.g., Traugott & Dasher 2002), the prime example of which is Japanese addressee honorifics, which are suffixes that code the specific social relation between a speaker and a hearer in terms of respect, intimacy, or social distance. For Traugott and Dasher (2002: 22) and Traugott (2014) intersubjectivity is closely connected to and cannot be defined without reference to subjectivity. Both synchronically and diachronically, subjectivity is considered a prerequisite for intersubjectivity. While subjective expressions index speaker attitude or viewpoint, markers of intersubjectivity, in this view, additionally index the speaker's "attention to AD[dressee]/R[eader] as a participant in the speech event, not in the world talked about" (Traugott & Dasher 2002: 22).

Building on the Cognitive Grammar framework developed by Langacker (1991), Verhagen (2005, 2007) has proposed an account of intersubjectivity in terms of cognitive coordination between speaker and hearer. In intersubjective constructions, the hearer is more explicitly foregrounded as the active interpreter of utterances of the speaker. In this view, the hearer is hence not only a passive addressee guided by the speaker to focus on a given conceptual content, but crucially is an active conceptualizer. Importantly, in Verhagen's view, this cognitive coordination task of speaker and hearer is always present in communication, but it is coded more explicitly in some constructions than others, e.g., negation patterns. Verhagen (2005) gives the example of *She is **not happy*** versus *She is **unhappy***, where only the former, i.e., sentential, negation *not happy* takes into account the presence of another perspective than that of the speaker, which is then negated. The morphological negation *unhappy* does not bring in a distinct viewpoint according to Verhagen.

Nuyts (2001a, 2001b, 2014), based on his research into the expression of modal meanings, has developed yet another view on intersubjectivity. For him it refers to meanings "presented as being shared between the assessor and a wider group of people, possibly (but not necessarily) including the hearer" (Nuyts 2014). Hence, whereas *Given the instability in the country **it is likely** that the army will intervene* is intersubjective, *In such an unstable situation **I think** the army will intervene* qualifies as subjective.

3. Critical Issues and Topics

As the fairly short characterizations in section 2 show, the three main perspectives on intersubjectivity are all quite different and cannot be used interchangeably. Important (interlocking) points of divergence concern the status of intersubjective meanings: are they considered to be coded (i.e.,

semantic or semanticized), or are they pragmatic in nature? Secondly, there is the issue of operationalizing intersubjectivity diachronically in terms of intersubjectification. Thirdly, there is the question of which types of language phenomena can be described and explained in terms of intersubjectivity. This links up with the question of whether it is useful or even possible to distinguish between subtypes of intersubjectivity. Fourthly, there is the important question of whether intersubjectivity (and intersubjectification) can be said to be conceptually independent, especially with regard to subjectivity (and subjectification). Some authors, such as López-Couso (2010), use the term '(inter)subjectivity' with 'inter' in between brackets to cover both notions or even seemingly lumping them together. The use of such a conflated label suggests that the boundaries between non-subjectivity, subjectivity, and intersubjectivity are at the very least vague or fuzzy rather than clear-cut. The possibility of distinguishing between these notions will in turn partly determine the possibility to draw up recognition criteria that are exclusive to intersubjectivity and intersubjectification, and their cross-linguistic validity.

Traugottian intersubjectivity, for instance, refers to the semantics of constructions, i.e., to (coded) meanings. In Japanese, for instance, honorifics form a well-established system within the grammar. Honorifics are obligatory and leaving them out would create a social *faux pas*. In addition, Traugott would say that some expressions can have an intersubjective meaning dependent on the specific context at hand but it is hence pragmatic in nature only. For instance, *a bit (of)* can function as a hedge, downtoning the upcoming noun or adjective so as not to offend the hearer, as in *It was a bit boring*. However, in other contexts it can be used as a booster or simply to indicate a small quantity.

Verhagen's and Nuyts's understandings of intersubjectivity are inherently more pragmatic in nature, in that they do not refer to meanings as such but rather to the rhetorical representation of meaning. For Nuyts (2014), for instance, intersubjectivity is a discursive tool or strategy that allows the speaker to represent meaning as shared as opposed to it being restricted to one speaker. In the context of modals, Nutys (2014: 58) says that "[a]modal evaluation is 'intersubjective^{IN}' if it is presented as shared between the assessor and a wider group of people, possibly (but not necessarily) the hearer". ***It is unacceptable*** *they left already* is hence intersubjectively deontic. However, ***I really regret*** *that they left already* is a subjective deontic assessment since it is presented as "being strictly the assessor's sole responsibility" (Nuyts 2014: 60; emphasis mine).

In terms of synchronic and/or diachronic implementations, Traugott's framework is the only one that is well-developed both synchronically and diachronically. In addition, it also seems more generally applicable to a wide range of phenomena, even though she (2014) argues that there are two main types of language functions that most likely give rise to intersubjective meanings, namely politeness and particular metadiscursive functions.

The Cognitive Grammar notion of intersubjectivity put forward by Verhagen (2005, 2007) has not been developed diachronically yet. Nuyts, in contrast, has developed a framework that can account for both intersubjectivity and intersubjectification, but it is strongly linked to the domain of modality, and it is difficult to see how it could be extended to other domains of language.

Traugott's framework hence seems the most promising to account for synchronic variation as well as for diachronic processes of change, and might be general enough to account for phenomena from a variety of domains including not only politeness and metadiscursive markers, but also modality, and the verb phrase in general, as well as adjectives, the noun phrase, etc. However, it is important to keep in mind that Traugott's notions of intersubjectivity and intersubjectification depend conceptually on subjectivity and subjectification. Intersubjective meanings are said to develop later than subjective ones and the latter are a prerequisite of the former.

Section 4 will summarize the most relevant current answers to the critical issues and topics presented here.

4. Current Contributions and Research

4.1 Semantics versus Pragmatics

Authors like Traugott have come to emphasize the importance of distinguishing between pragmatic intersubjectivity and semantic intersubjectivity. Traugott (2010: 32) acknowledges that communicating with another person always involves intersubjectivity in a general sense, and discourse can only be communicatively successful if speakers pay attention to the audience's needs, and to 'mutual management' (Schiffrin 1990; Nuyts 2001a, 2001b; Verhagen 2005). Thompson (2014: 78) similarly states that all discourse is "constructed fundamentally in terms of exchanges between interactants in communicative events in which each interactant shapes their message to accommodate and affect the other". As indicated in section 3, what distinguishes Traugott's notion of intersubjectivity from Nuyts's or Verhagen's approach is that she is interested in coded intersubjective (or rather intersubjectified) meaning. Pragmatic intersubjectivity, then, refers to "the ambient context in which linguistic change takes place and to which linguistic change contributes" (Traugott 2010: 32).

Particularly in cases of currently ongoing change it is very difficult to make the distinction between pragmatic and semantic intersubjectivity. I will not be making any bold claims concerning the pragmatic or semantic nature of the intersubjective meanings discussed in the following sections and will propose to treat it as a pragmatic-semantic phenomenon.

4.2 Range of Phenomena and Subtypes of Subjectivity

Traugott (2003: 128) argues that

> Intersubjectivity is the explicit expression of the SP/W's attention to the 'self' of addressee/reader in both an epistemic sense (paying attention to their presumed attitudes to the content of what is said) and in a more social sense (paying attention to their 'face' or 'image needs' associated with social stance and identity)

As stated earlier, Traugott (2014) connects two main functions of language with intersubjectivity, i.e., politeness and metadiscursive functions. Politeness involves "the encoding of the Speaker's appreciation and recognition of the Addressee's social status" (Traugott 2003: 128) and qualifies as intersubjective because

> intersubjective meanings crucially involve social deixis (attitude toward status that speakers impose on first person–second person deixis). They impact directly on the self-image or 'face' needs of SP/W or AD/R.
>
> *Traugott & Dasher 2002: 23; SP/W refers to speaker/writer and AD/R to addressee/reader*

Textbook examples of intersubjective meaning in the context of politeness are Japanese honorifics, e.g., Modern Japanese *mas-u-* ('let come') which grammaticalized from a main verb into a subjective verbal suffix coding humility, and finally became the intersubjective addressee honorific, which has become obligatory in certain social contexts:

(1) Go-kyōryoku no hodo o-negaimōshiage**masu**
'We respectfully request the favor of a measure of your cooperation.' (Narrog and Heine 2018)

Less exotic examples are the so-called T/V pronouns (from French *tu* and *vous*), such as *vous* and *Sie* in French and German respectively, which were originally second person plural pronouns but have also developed singular polite reference or are used to signal social distance. Hedging discourse markers such as *sort of*, which downtone the potentially negative impact of certain words, are also commonly accepted as being intersubjective:

(2) No it's not that bad the game actually it's alright but, it is a bit, **sort of** boring when you play it every day. (Brems 2011: 314)

Likewise, the discourse marker *well*, which can be used as a floorholder or as a dispreferred response signal (Defour 2008):

(3) "You think all these dudes are throwing their muscles around here just for fun and games?" "**Well**, it's partly that, I guess. But, Teach, a lot of it has to do with money."[1]

Paradoxically, however, even though such expressions explicitly involve a speaker linguistically paying heed to a hearer, Traugott and Dasher (2002) for instance classify T/V pronouns as mostly subjective, rather than intersubjective, and Traugott (2014) would consider *well* as intersubjective, but only pragmatically so, i.e., the intersubjective function would not be coded (see section 4.1).

As to metadiscursive markers, Traugott (2014) singles out "turn-giving or elicitation of response" such as question tags (*isn't it?*) or clause-final *right?* Rather than serving as face-saving devices, these markers aim to solicit some sort of action from the hearer and support discourse continuity.

Ghesquière et al. (2014: 134) have argued that more types of meanings than just politeness and metadiscursive ones can be considered intersubjective. In their view intersubjectivity is inherently hearer-oriented and crucially relies on "the creation of joint attention" (cf. Diessel 2006). Since this attention can pertain to different aspects, they propose a typology of intersubjective meanings and distinguish between attitudinal, responsive, and textual intersubjectivity. They state that the boundaries between these subtypes are by no means discrete and expressions may combine various subtypes of intersubjective meanings.

Attitudinal intersubjectivity expresses a speaker's attention to the social self of the hearer and their face needs. Honorifics and English *sort of* as well as other hedges illustrate this subtype. Responsive intersubjectivity is illustrated by question tags, clause-final *right?* and turn-taking devices, and involves elicitating a verbal response or action from the hearer, while also enhancing discourse continuity. Textual intersubjectivity, then, pertains to elements that are used to guide the hearer's interpretation of a stretch of discourse, for instance by helping to identify or track a particular discourse referent. Demonstratives, such as *this/that* or *these/those* illustrate this in that they explicitly point out discourse referents and "focus the hearer's attention on elements in the ongoing discourse" (Ghesquière et al. 2014: 136). In addition, (in)definite determiners like English *a(n)* and *the*, which lack the pointing meaning of demonstratives, would also qualify as textually intersubjective. They help the addressee to make cognitive access with the intended referent by signaling, among other things, whether the referent is presumed known or not (cf. Ghesquière 2011, 2014).

Importantly, especially when it comes to classifying textual meanings, authors do not always see eye to eye. Traugott (1982) sees conjunctions like concessive *while* as subjective in nature and not intersubjective since they allow a speaker to impose a concessive link on two clause contents. Narrog (2014) argues that textual meaning is neither objective, subjective, nor intersubjective and that its development involves a process that is *sui generis*; it cannot be captured by (inter) subjectification, but has to be recognized as a separate process. Breban (2010: 115) seems to view

all textual meaning as intersubjective. With Ghesquière et al. (2014) I would argue that (at least) some textual meanings can be considered intersubjective, as illustrated above.

In any case, intersubjectivity can be said to include more than just politeness markers, and may be extended to response-eliciting devices, as well as determiners, which allow a speaker to negotiate discourse referent tracking for the hearer. Intersubjectivity then not only includes attitudinal meanings focused on the social self and face of the hearer (Traugott & Dasher 2002), but also responsive and textual intersubjectivity, demonstrating other types of hearer-orientation.

4.3 Conceptual (In)dependence, Diachrony, and Directionality

Several authors have looked into the relation between non-subjectivity (or objectivity), subjectivity, and intersubjectivity in terms of their conceptual (in)dependence as well as the relative chronological order of subjectification and intersubjectification. As noted above, authors such as Traugott have stated that intersubjective meanings and especially intersubjectification typically or even always presuppose an earlier stage of subjectivity and subjectification. Intersubjectification is then considered to be conceptually and temporally dependent on subjectification with meanings unidirectionally changing from subjective to intersubjective and not the other way around. Supporting this view, Degand and Fagard (2012: 159) argue that "interactional [intersubjective] elements are necessarily subjective, while the reverse is not true; in other words, intersubjectification presupposes subjectification". They illustrate their claims by means of a case study of the French conjunction *parce que* ('because'), which first appears with a subjective meaning (4) (so-called external negation) and later with intersubjective meaning (5) (so-called internal negation):

(4) mort me fis en mi la voie por ce que trop grantfain avoie (Roman de Renart, early 13th century)
'I played dead in the middle of the road, because I was terribly hungry'

(5) Bon, vous me racontez. Qui conduisait votre taxi?—Que je vous explique. J'ai un ami, Toni, enfin un copain. Parce que, vé, on est pas intimes, vous comprenez (Contemporary French; Sicca & Izzo 1995)
'Ok, you tell me. Who was driving your cab?—Let me explain. I have a friend, Toni, well, a buddy. Because, y'see we aren't intimate, you understand'

In (4) subjective *parce que* causally links two states of affairs, whereas in (5) intersubjective *parce que* introduces grounds for a specific reasoning. Other examples illustrating that subjective uses of constructions precede intersubjective ones often subsume honorifics and hedges in Traugott's and Narrog's work and modal auxiliaries in Nuyts's work.

Traugott's definition of intersubjectification by definition relies on unidirectionality, whereas the definition of (subtypes of) intersubjectivity in section 4.2 can be seen as an attempt to define it independently from subjectivity, since it does not assume that intersubjective meanings necessarily derive from earlier subjective ones. In this vein, Ghesquière (2011, 2014) has shown that intersubjective uses of a certain construction may precede subjective uses, rather than follow them. Her case study discusses *such*, which can be used as a determiner (6) or an emphasizer (7):

(6) Breast cancer is the most common cause of death from cancer in Australian women. Diagnosing **such** a cancer early, while it's still small, enables the best possible chance of a cure.

(7) You've been so good to me and I've been **such** a horrible, horrible bitch of a friend.

Following Ghesquière et al (2014) determiners are textually intersubjective since they help a hearer identify the intended referent, in (6) by establishing anaphoric reference to *breast cancer*. As an

emphasizer, *such* is subjective in that it allows the speaker to express the extent to which she evaluates herself as horrible. Crucially, the intersubjective determiner use is attested earlier than its subjective emphasizer use and so *such* goes against the 'expected' directionality. Needless to say, this crucially depends on whether or not one accepts to classify determiner uses as intersubjective and hence on the definition of (inter)subjectification used. In any case, when subjective and intersubjective meanings and the diachronic processes that give rise to them are defined independently, intersubjective meanings may precede subjective ones.

Furthermore, the different subtypes of intersubjective meanings (attitudinal, responsive, and textual) may display different tendencies diachronically with regard to (earlier or later) subjective uses. In addition, there is the question of whether the various subtypes of intersubjective meanings show directional tendencies (between them). Cornillie (2008: 56), for instance, hypothesizes that discourse markers or parentheticals, classified as attitudinally intersubjective by Ghesquière et al. (2014), may derive from previously subjective uses. However, the emergence of evidential and epistemic uses of Spanish semi-auxiliaries *parecer* and *resultar* suggests the opposite chronology, with intersubjective uses preceding subjective ones. As to directionalities between subtypes of intersubjective meanings, Ghesquière et al. (2014: 144) put forward that "textually intersubjective items may develop from responsively intersubjective ones", but are otherwise cautious about proposing other directional pathways. They conclude that "the chronological link between subjectified and intersubjectified uses is better described as multidirectional".

Further research will first have to evaluate the validity of the proposed typology of subtypes of intersubjectivity and then check whether systematic directionalities can be found for those various subtypes.

4.4 Recognition Criteria

Intersubjectivity is a pragmatic-semantic notion, but in any functional-cognitive or constructional framework it is important to check for formal correlates and hence find formal recognition criteria to further operationalize the notion. For subjectified elements it has been pointed out that they have lost a number of formal properties, in that they can no longer be brought under the scope of negation, are not focusable, cannot be submodified or graded, and do not allow pronominal substitution (see De Smet & Verstraete 2006). Adamson (2000: 44) has argued that as items shift from objective to subjective meaning they diachronically undergo so-called leftward movement, as with *lovely*; compare its descriptive use in *a* ***lovely*** *lady* and its use as a (subjective) intensifier as in ***lovely*** *long legs*. In the latter, *lovely* occurs in a more leftward slot vis-à-vis the head noun.

Again, it may turn out that the different subtypes of intersubjective meanings match up with different formal correlates, or even that no set of formal correlates can be found that unambiguously and exclusively applies to (all subtypes of) intersubjective meaning. Non-focusability and resistance to negation do not seem to work for textually intersubjective items like determiners, though they might apply more easily to attitudinally intersubjective ones such as hedging discourse markers. *Sort of*, for instance, cannot successfully be the focus of an *it*-cleft, as shown by (9), whereas English demonstratives can be questioned, focused on, or negated (*Was it THAT girl or THIS one?*).

(8) It kept **sort of** pouring out of his pocket, his brother said.
(9) *It was **sort of** that it kept pouring out of his pocket, his brother said.

The formal correlates proposed for (inter)subjectivity (see López-Couso 2010) seem to work for both subjectivity and some types of intersubjectivity and are hence diagnostic of non-objective meaning as such. I will go through the two most important and promising propositions suggested

in the literature, but we have to keep in mind that they will most probably not be exclusive to intersubjective meanings and may be language-specific.

First, there is a positional reflex, in that it has been pointed out that there is a functional division of labour between the right and left periphery in the clause. Degand (2011) associates the right periphery with addressee-accommodation, and hence intersubjectivity. Traugott (2014: 22) provides some further evidence for this claim, but confirms that it is not without exceptions, even though as a generalization "it appears to be robust". Other examples are English tag questions (10) and the clause-final Korean particle *-tanikka* in (11), which is similar in function to the English parenthetical *you know*:

(10) It is the twenty fourth of September **isn't it**? (Kimps 2007: 283)
(11) pi-ka on-n-**tanikka**
'It's raining, you know! (How many times should I tell you?/Don't you trust me?/…)'
(Rhee 2010: 3)

If intersubjectivity is, among other things, "oriented toward turn-giving, or elicitation of response, and towards the Addressee's stance and participation in the communicative situation" (Traugott 2014), the right periphery seems an appropriate place, because it is where "the speaker hands over his/her conversational turn, and wants to accommodate the addressee so as to ensure the steady flow of discourse" (Ghesquière et al. 2014).

The left periphery (and leftward movement), on the other hand, has been associated with subjectivity and subjectification, as argued by Adamson (2000), but also Beeching et al. (2009). Again, more research is needed to put these associations between (sub)types of meanings and left or right periphery to the test, not just in English, but in a typological perspective. Furthermore, it remains to be seen whether attitudinally, responsively, and textually intersubjective markers display the same preference for the right periphery.

Secondly, there is prosody and more specifically intonation, as potential diagnostics for intersubjectivity and intersubjectification. Kimps (2007) has shown a link between (responsively intersubjective) English question tags and rising intonation and/or high pitch. Of course, one might claim that these prosodic features might also just be characteristic of interrogative mood as such, but interrogative mood is inherently addressee-oriented and hence at least pragmatically intersubjective in nature. Ohala (1983, 1984, 1994) has argued that high pitch and rising intonation are biological markers of submission, which seems an intersubjective notion. Obviously, more work is needed here too.

5. Future Directions

As indicated in the previous sections, further research is needed to test the validity of the typology of intersubjective meanings as well as the recognition criteria and directional hypotheses proposed. Section 4.4 has shown that it is difficult to find formal recognition criteria that exclusively characterize intersubjective elements. An additional question is whether they will turn out to be valid in a typologically varied sample of languages. The tendency for intersubjective elements to be associated with the right clausal periphery does seem to be confirmed cross-linguistically, since it is attested not only for Germanic languages like English, Dutch, German, and Norwegian, and Romance languages such as French and Italian, but also for Japanese, Chinese, and Korean (Van der Wouden & Foolen 2011).

Note

1 All examples that do not cite a specific source were extracted from Collins Wordbank Online.

Further Reading

Brems, L., Ghesquière L., & Van de Velde, F. (Eds.). (2014). *Benjamins Current Topics: Vol. 72. Intersubjectivity and intersubjectification in grammar and discourse: Theoretical and descriptive advances*. Amsterdam: John Benjamins. (This volume also includes studies of intersubjectivity within applied linguistics, where notions such as evaluation, stance, appraisal, and metadiscourse can be said to partially overlap with the notion of intersubjectivity. Thompson (2014) for instance is a case study in which two sets of UK newspapers are compared in terms of differences in the intersubjective choices they make when interacting with their respective audiences. Ädel (2014) addresses intersubjectivity within English for Academic Purposes and studies the use of the second person pronoun *you* both in spoken and written academic data and can convincingly argue that it fulfills many discourse functions, and that not all of them can be analyzed as truly intersubjective in the sense of working as an engagement marker.)

De Clerck, B., Decock, S., Vandenberghe, J., & Seghers, M. (2019). Theory versus practice: A closer look at transactional and interpersonal stance in English electronic complaint refusal notifications. *English Text Construction*, *12*(1), 103–136. (This article studies transactional and interpersonal stance in English electronic complaint refusal notifications. Based on a corpus study and an experiment, they study the rhetorical moves and linguistic realizations of complaint negotiations within this specific business genre. The linguistic strategies to mitigate the illocutionary force of this potentially face-threatening speech act are described. The authors do not use the term intersubjectivity, but notions like "interactional justice" and the importance of politeness, respect, and transparency can easily be linked to it.

For studies on intersubjectivity and intersubjectification outside of English see for instance:

Cornillie, B., & Cabedo, A. (2011). On the prosody of subjective and intersubjective modal adverbs in Spanish. Paper presented at the 12th International Pragmatics Association Conference (IPrA). Manchester, July 3–8, 2011.

Narrog, H. (2010). (Inter)subjectification in the area of modality and mood—concepts and cross-linguistic realities. In K. Davidse, L. Vandelanotte, & H. Cuyckens (Eds.), *Subjectification, intersubjectification and grammaticalization* (pp. 385–429). Berlin: De Gruyter Mouton.

Beeching, K., & Detges, U. (Eds.). (2014). *Discourse functions at the right and left periphery: Crosslinguistic investigations of language use and language change*. Boston: Brill. (This volume further explores the hypothesis that the left and right periphery of clauses cater to different types of meanings and are hence not symmetrical. It includes corpus studies on English, French, Italian, Chinese, Korean, and Japanese, which mainly confirm the association between the right periphery and intersubjective elements.)

Related Topics

cognitive semantics; cognitive grammar; grammaticalization, lexicalization, and constructionalization; cognitive pragmatics; cognitive linguistics and linguistic typology; diachronic construction grammar

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20
GROUNDING

Frank Brisard

1. Introduction

Grounding concerns the final step in going from a type conception (e.g., *apple*, *to rain*) to the conception of a specific instance (e.g., *the apple*, *it's raining*). It is a notion that is not only relevant but essential in the construal of two types of grammatical structures: nominals (so-called noun phrases) and finite clauses. In the nominal realm, *things* (in the technical sense as proposed in Cognitive Grammar) are typically grounded in space, and *processes* (involving a verb and its complements, referring to states of affairs) are grounded in time, unless some modal qualification applies. The relevant grammatical categories corresponding to the different *grounding predications* include determiners and certain quantifiers for nominals, and tense markers and certain modal auxiliaries for finite clauses. In line with the symbolic perspective adopted by Cognitive Grammar, all of these constructions are considered meaningful, not just in terms of the reference that is established by using them, but also in the sense of conjuring up certain basic cognitive mechanisms and psychological concerns that are taken to be universal and essential to coherent discourse (e.g., ways of directing the interlocutors' attention). Cognitive Grammar detects a level of parallelism between nouns and verbs, in terms of how they are organized as basic categories as well as, crucially for the present purposes, at higher levels of grammatical organization, viz., in how they come to refer. Moreover, it posits that at the most schematic level, all grounding predications are essentially expressions of epistemic concerns.

In section 2, I will first outline what I refer to here as the 'standard theory'[1] of grounding, as originally developed in Space Grammar (introducing key notions such as 'speaker control' and presenting an analysis of the English auxiliary) and Cognitive Grammar and culminating in Langacker (1991). In section 3, I present the revisions that have been proposed recently, focusing on the status of zero and constructions with a more peripheral grounding status. Interesting implications arise from them which have not yet been fully explored. In section 4.1, I ask three questions that are meant to illustrate promising further avenues of research. I will end with a brief discussion of a possible case of intermediate grounding, the periphrastic (present) progressive, in which tentative answers are formulated to the questions raised (sections 4.2–4.4). Section 5 presents some concluding remarks.

2. The Standard Theory

Most generally, grounding involves the relationship between an instance of a thing or process[2] and the speech-act participants and their spheres of knowledge (the *ground*). To conceive of an instance of an object or a situation is a prerequisite for referring to them, or conversely, reference consists in the conception of an instance:

> The conception of an instance arises when a type is "anchored" in the domain of instantiation, i.e. when the profiled entity is thought of as occupying a particular location in that domain and thus distinguished from other instances.
>
> *Langacker 1991: 96*

An entity's location in its domain of instantiation can be taken literally if the entity is a singular thing and the domain is that of space; otherwise, non-spatial and/or non-singular tokens are distinguished from other tokens of the same type by being bounded as an abstract region in 'quality space'. With processes, the domain of instantiation is, obviously, time, which features in the time-line model that is one elaboration of the 'basic epistemic model' speakers entertain about reality. The other, 'elaborated epistemic model', allowing for different types of irreality, is invoked for describing the meanings of clauses grounded by modal auxiliaries. By definition, a grounding predication *profiles* the grounded entity rather than the grounding relationship, which figures in the conception's background. Profiling is an act of conceptual designation and correlates with what a speaker wants to refer to. Semantically, it boils down to assigning more salience to some element (an entity or a relation) in a conceptual configuration than to others, which contributes to that configuration featuring a *minimal scope* (that which the expression is actually about) and a *maximal scope* (its conceptual background, semantically relevant but not the point of the expression).

To illustrate the difference between expressions that invoke the ground to varying degrees of salience, consider the contrast between the deictic adverb *now* and the simple present tense in English. Both involve a conception of the time of speaking, but they construe it differently (lexically vs. grammatically). With the adverb *now*, the time of speaking is actually profiled (that's what makes it a deictic expression), yet "a clause is not rendered finite by its presence; note its occurrence as part of an infinitival complement: *She would really like* ***to be here now***" (Langacker 2002a: 8). In contrast, present-tense marking, also deictic, is not about referring to the present the same way as with the adverb *now*. Here, the relation with the ground/time of speaking figures in the background, implicit, and non-salient, serving only as an 'offstage' reference point, whereas what is profiled is the process referred to by the verb that combines with the present-tense marker.

Schematically, then, nominal and clausal grounding can be diagrammed as in Figure 20.1. In Figure 20.1(a), the ground (G) is linked to the schematic conception of a nominal entity; this is the grounding relationship (R_g). The expression's immediate scope is symbolized by the dashed-line rectangle. Thus, in the nominal expression *the apple*, the actual reference is to an instance of the category of apples, identified through the semantic contribution of the definite article, which is to indicate familiarity with that instance (from context or previous mention…). The latter information is what is contained in the grounding relationship stipulated for definite articles. In Figure 20.1(b), the same relationships of salience obtain, except that the grounding now concerns a process, rendered by the relation between a trajector (tr), or a verb's subject, and a landmark (lm), a non-subject complement that receives secondary prominence. Both the process and the two participants are profiled whereas the grounding relationship, indicating a temporal relationship with the ground, is not. Again, in the finite clause *she loved me*, the reference is to a specific state of loving between two individuals, identified through the information provided by the tense marker that this state precedes the time of speaking.

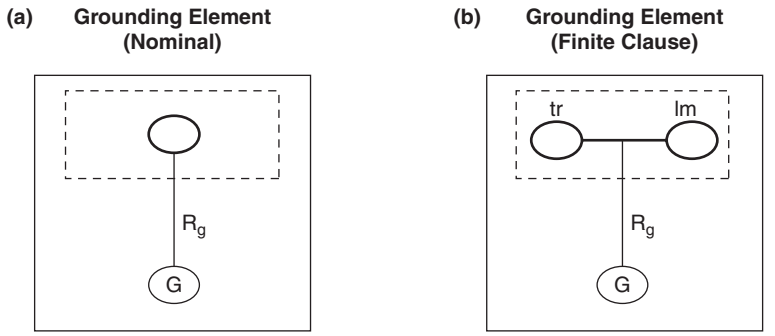


Figure 20.1 Nominal and clausal grounding
Source: Langacker 2002a: 13.

Table 20.1 Nominal and clausal grounding in English

	Definite	*Quantificational*
Nominal	*th* + prox/dist (*-is*, *-at*, …)	*Ø*, *sm, a, some, most, ...*
Finite clause	Ø + prox/dist (*Ø*, *-ed*, …)	*may, will, ...* + prox/dist

Source: Langacker 2002b: 30.

Nominal grounding predications include determiners and certain relative quantifiers (i.e., those with determiner qualities). Clausal grounding is achieved by tense marking and certain modal auxiliaries (i.e., those without a tense contrast that can be interpreted temporally). Which quantifiers and modals qualify for the status of grounding predication is partly language-dependent. For English, the list of nominal and clausal grounding predications is standardly represented in Cognitive Grammar as in Table 20.1.[3]

The features that decide on an expression's status as a grounding predication are partly formal (e.g., mutual exclusiveness of articles, demonstratives, and grounding quantifiers, or the non-temporal interpretation of tense contrasts with grounding modals), but the formal features are always motivated by these expressions' semantics. A grounding predication cannot combine with another grounding predication, because every nominal/finite clause can only be epistemically anchored once. And this is exactly what all grounding predications, nominal and clausal, have in common: They indicate the epistemic status of a grounded instance vis-à-vis the ground, thereby enabling its distinction from other instances of the same type conception (or, in other words, singling out a unique instance for the purpose of establishing reference). Cognitive Grammar proposes two categories, definiteness and quantification, expanded with a proximal/distal contrast wherever it makes sense, to demonstrate the basic parallelism that characterizes the core grounding systems for nominals and clauses. Given that the domains of instantiation differ for nominals and clauses, the epistemic anchoring will be realized differently: It comes out as a concern with identification in the case of nominal grounding, because the objects that nominals typically refer to have a tendency to endure and the issue of their existence is presupposed, whereas with clausal grounding the key question is whether the situation referred to is realized or not. Nominal grounding addresses the concern with which object is being singled out (from many possible ones), whereas clausal grounding deals with the question whether (and if so, when) something happened.

Grounding is an example of an essentially subjective construal. We assume that canonically speech-act participants (speaker and hearer) are primarily interested in an external object/situation

that is linguistically described. However, reference to that object/situation is by default established by indicating its relation to the ground, so that an expression's scope, in assembling a nominal/finite clause, also encompasses relevant facets of the ground. Because the role of the ground is limited to this function, it is construed subjectively/offstage, as the real attention is directed to the objective entity onstage. This subjective quality of grounding predications is usually the result of a diachronic process of subjectification, and in any case the viewing arrangement that specifies an expression's organization of subjective and objective meaning elements can be subject to change, especially in contexts of grammaticalization. Consider the case of the French *passé composé*, treated as a periphrastic marker of temporal anteriority and therefore not a true grounding predication, in line with Cognitive Grammar's general analysis of aspectual markers: "The French *passé composé* […] specifically profiles the relationship of temporal anteriority. Hence it is not a grounding predication, and indeed, the auxiliary verb *avoir* itself takes finite-verb [i.e., tense, FB] inflections" (Langacker 1991: 225). Whereas that might be an accurate description of this construction's makeup at some point in the course of its grammaticalization (following the reanalysis of *avoir* from a lexical verb to an auxiliary), one could wonder whether this remains true even if the *passé composé* in present-day French seems to function much like a past tense. Many European languages have experienced a reorganization of the domain of past-time reference (known as 'preterite loss') following the introduction of a new construction next to the old simple past, usually described as a kind of perfect. Thus, in order to account for the fact that a construction like the *passé composé* can now be used in what used to be simple-past contexts (*I saw her yesterday* vs. *Je l'ai vue hier* and ??*Je la voyais hier*)[4] we must assume that the analysis presented above is subject to additional change, and that when the construction does evolve further, the resulting grounding status that is acquired will semantically go hand in hand with a higher degree of subjectification and a shift in profile, from the grounding relationship to the grounded situation (expressed by the lexical verb). Such an evolution is in principle available for any kind of perfect construction, however it is formally realized.

This possibility is explicitly acknowledged in Cognitive Grammar (Langacker 1991: 225), but it immediately raises the question why it would then still be possible to assign tense marking to the auxiliary (given that no grounding predication can in turn be grounded itself; cf. above). Here, we have a formal criterion (tense marking on the auxiliary) going against a functional one, viz., the observation that the *passé composé* is clearly a separate construction in the tense/aspect system of French with its individual properties, next to the simple past, and that the labor for past-time reference is divided between the two. A possible way out of this is to allow that grounding status can somehow be assigned to larger units which, whereas being compositional/periphrastic, exhibit semantic affinities with the type of schematic functions effected by grounding. This seems especially relevant for tense/aspect constructions that are on their way of becoming full-fledged grounding elements, entering into competition with older members of a language's paradigm of clausal grounding predications. Cases could be made for analyzing constructions such as English *be going to/gonna* (cf. Langacker 1990) and the present perfect as specializing into expressing a number of specific meanings that can all reasonably be described as relating to the epistemic concerns associated with the use of true grounding predications (see Brisard 2013 for a few arguments). Similarly, the set of modal auxiliaries qualifying for grounding status is not fixed[5] and it has been argued (cf. section 3) that some modals can take tense and mood marking and still appear to be grounding a clause on the basis of their semantics. Thus, grounding could be seen as a gradient category, with certain (universal?) core members and (many?) more peripheral ones, and with a construction's status as a grounding predication possibly evolving over time.

Within the standard account of grounding in Cognitive Grammar, reference is made to zero elements performing a grounding function, both in the nominal (e.g., the zero indefinite article with mass nouns and plurals) and in the clausal realm. For instance, in English the simple present is phonologically unmarked, with the subject-verb agreement marked by *-s* in the third-person

singular being analyzed as part of a grounding predication that also specifies the trajector of the designated process. The zero marking is supposed to correlate iconically with the expression of (in this case temporal) immediacy: "[A] grounding predication is posited for a finite clause even when it has no overt manifestation (e.g., *They like her*). Thus, among the grounding elements is one that is phonologically zero (i.e., [[…] → […]]) and locates the profiled process in immediate reality" (Langacker 1991: 247). Similarly, a zero element is also posited with absolute quantifiers in English, which do not count as grounding predications and therefore need another expression (the zero indefinite article) to ground the nominal that they are part of: Thus, the nominal *three chairs* is analyzed as *Ø three chairs*. In retrospect, however, positing a zero element is acknowledged to be "theoretically suspect and descriptively unnecessary" (Langacker 2017: 236). In fact, it is the problematic status of zero that has triggered a revised account of grounding in Cognitive Grammar which 'unifies' the analysis specifically of marginal, intermediate candidates for grounding status.

3. Revisions/Extensions

As suggested above, grounding may not be confined to the traditionally recognized grounding predications. Mortelmans (2006: 152) notes that, although the German modal auxiliaries are on the whole less grammaticalized in that they are grounded themselves by tense, person, and mood inflections, some of them look semantically equivalent to what are considered true grounding predications in English, as illustrated by the examples in (1):

(1) (a) *You* must *come right away.*
(b) *Du* musst (= IND+müssen) *gleich kommen.*
(c) *You* should *be more careful.*
(d) *Du* solltest (= KONJII+sollen) *vorsichtiger sein.*
(e) *That* might *be true.*
(f) *Das* könnte (KONJII+können) *stimmen.*

Both Mortelmans (2016) and Diewald (1999) show that grammatical properties of modal auxiliaries with such grounding functions can vary from one modal to the next, depending on the type of modality they express. In particular, the formation of non-finite forms is more or less impossible with those modals that are used epistemically. The same epistemic modals do not easily come in preterite forms, either, and when they do, this typically indicates a shift in perspective rather than temporal anteriority. All of this suggests that epistemic modals, even when they appear formally grounded by tense and mood (e.g., *könnte* is a past conjunctive), can be analyzed as more highly grammaticalized than their deontic/root counterparts in German, thereby qualifying more easily than the latter as functioning as grounding predications. The idea that grounding status can be a matter of degree has also been proposed for the English modal system, with members that seem to exhibit varying preferences in terms of the 'scope' reading they prefer (Pelyvás 2006). As attenuation of subject control (which is typical of a wide-scope reading and whereby the locus of the modal force is diffuse and not identified with the grammatical subject) is indicative of an increased degree of subjectification (Langacker 1999: 308), wide-scope uses of deontic *should/ought to* (e.g., *this ought to be fun* = OUGHT TO [this, (be fun)]) are probably better candidates for true grounding status than the typically narrow-scope uses of the root modals *must* and *can* (e.g., *we must find out* = [we, MUST (find out)]). Alternatively, when *must* and *can* are used with passive complements or expletive subjects, a wide-scope reading is enforced and the subject is construed in a more subjectified way. Thus, even with individual modals, grounding status can be said to vary depending on the specifics of their use, over and above the type of modality they express.

The observations presented above, whereas certainly relevant, have not radically altered the picture of grounding presented in Cognitive Grammar. The theory inherently accommodates degree of

category membership, and Langacker has repeatedly stated (e.g., 2009: 150) that his descriptions of English have concentrated on the "core grounding systems, with no pretense that these are exhaustive or sharply distinguished from other phenomena". It is with Davidse's (2004) proposal that initial absolute quantifiers, not standardly recognized as grounding predications, be analyzed nevertheless as grounding a nominal in their own right that the "theoretically suspect" nature of zero elements (here, of a putative zero indefinite article) is confronted head-on. This has led to a reformulation of what the category of grounding is about: Despite its central role in a language's grammatical system, it should not be seen as a grammatical category, but rather as a semantic function that can be fulfilled through other than overtly realized forms. This relative downplaying of the formal requirements for grounding a nominal or clause acknowledges the relevance of other, covert or indirect, strategies, and ultimately gets rid of the need to posit any kind of zero grammatical elements (see, for instance, Langacker 2008: 272ff). So let us see how this works for the absolute quantifiers in English.

One of the first observations concerning nominal quantifying grounding predications in English is that they cannot serve as clausal heads (e.g., Langacker 2002a: 12). This is illustrated by the first two sets of examples in (2) (from Langacker 2017: 236), with only the so-called relative quantifiers in (2b) qualifying as grounding elements on the basis of this property:

(2) (a) *Our problems are* {difficult / many / few / three / numerous}.
(b) **Our problems are* {all / most / some / no / any}.
(c) *those three suggestions; his many complaints; the few victims who survived; the little money we are able to save*
(d) *three chairs; many professors; little attention; several houses; numerous criticisms*

The absolute quantifiers in (2a) behave more or less like adjectives (e.g., *difficult*) and can show up in adjectival positions, whereas relative quantifiers typically cannot. Like adjectives, they follow the determiner in definite nominals (2c), which is again ruled out with their relative counterparts (**those all suggestions*). With indefinite nominals, as in (2d), tradition assumes an analysis that, for the sake of the parallelism with the structures in (2c), posits a zero indefinite article preceding the adjectival quantifier (*Ø three chairs*).

This account is now rejected. With Davidse (2004: 531) comes a proposal to analyze absolute quantifiers as grounding elements when "functioning in the outermost layer of NP structure" (i.e., when initial). The new approach recognizes the relevance of 'covert strategies' for realizing a grounding function, next to other strategies equally inherent in grammatical structure, and results in the following analysis of definite and indefinite nominals involving quantification (from Langacker 2017: 245):

(3) (a) $[[\textit{those}]_{GR}\ [\textit{four}]_{QNT}\ [\textit{boys}]_{H}]_{NML}$
(b) $[[\textit{four}]_{GR/QNT}\ [\textit{boys}]_{H}]_{NML}$

The basic import of absolute quantifiers like *four* is quantificational, not referential. They are, in other words, not typically recruited to allow the individuation/identification of a referent (which is what grounding elements do). So in (3a), the job of the expression *four* is to indicate a quantity, and the actual grounding is done by the preceding demonstrative. One can say that the 'definite grounding function' is not inherent to absolute quantifiers. However, when an indefinite nominal is used, identification (in the narrow sense of pointing out unique individuals or maximal extensions of a mass) yields to concerns of quantification with respect to an unidentified referent. In those cases, the neutral epistemic status associated with absolute quantifiers (in definite nominals) is lifted due to the absence of an overt grounding predication and the quantifier is said to be 'functionally augmented': "An expression like *four boys* constitutes a nominal because it serves the function

of [indefinite, FB] nominal reference, which includes some indication of the referent's epistemic status" (Langacker 2017: 246). Specifying a quantity, therefore, is one way of 'achieving epistemic control', if no stronger (i.e., explicit) means present themselves. And epistemic control over a referent is what grounding is ultimately all about: With nominals, identification and quantification are complementary ways of expressing knowledge about the world.[6] The conclusion is that if the grounding role is not overtly taken up by a separate expression, a weaker expression can fulfill that role in addition to its usual, epistemically neutral, function.

Langacker (2008, 2016, 2017) now advocates a view of grounding as essentially a 'semantic function' (an interactive task to be fulfilled), which can be formally implemented in alternate ways. The focus on overtly realized grounding predications is widened to include such instances of covert grounding as just discussed with respect to nominals: In the set of oppositions *they drank the beer / some beer / beer*, the last option is interpreted as a grounded nominal by virtue of its use being analogous to that of the two previous structures, but no zero element needs to be assumed any longer (see the analysis in (3b)). Grounding can also be intrinsic to some expressions (personal pronouns, proper names), or indirect, as with possessives. In *Sheila's / this woman's / a lady's camera*,[7] the nominal gets its reference (definite in the first two cases, indefinite in the third) to a profiled instance of *camera* via the embedded grounded nominals *Sheila / this woman / a lady*. As a semantic function, grounding occurs whenever the ground has more than just a minimal presence in a structure and is "an aspect of conceptual organization by which an expression qualifies as a nominal or a finite clause" (Langacker 2008: 272), not appended to but inherent in the structural description/assembly at issue.

If the purpose of a grounded expression is to establish reference to a conceived entity, there are different strategies for achieving this. The most overt one is the deictic strategy, whereby a referent is identified in relative terms in the context of a discourse. Demonstratives, for instance, whether used pronominally or as determiners, have constant reference in the sense that they identify an entity that is (symbolically) pointed to. In combination with the descriptive strategy (reducing the class of referential candidates by modifying the head noun), nominals grounded deictically by articles or demonstratives provide a description that should enable the hearer to single out the intended referent. The quantificational strategy, in contrast, establishes reference in relative terms by specifying a magnitude in relation to another (virtual) entity, a benchmark consisting of "the set of eligible candidates, i.e. everything conforming to the basic or elaborated type description" (Langacker 2008: 279). This maximal extension of a type is what a speaker intends to refer to when no deictic or quantificational strategy is overtly resorted to, i.e., with bare nominals of the type *beer* or *dogs*. In line with previous formulations within Cognitive Grammar, both the deictic and the quantificational strategy characterize the behavior of grounding predications in the nominal as well as in the clausal realm. For finite clauses, the deictic grounding predications are the present and past tense and quantificational grounding is done by a set of core modals[8] (cf. Table 20.1). Unlike in previous versions, however, it is explicitly acknowledged that certain devices serving a grounding function can be intermediate in their status as grounding elements. But whichever the strategy selected, every language provides an inventory of means that enable the speaker to signal the epistemic status of a referent in terms of a limited number of fundamental and schematic basic oppositions. As a semantic function, grounding is in this sense indispensable to language and communication and therefore universal.

4. Illustration: Progressive Marking and Inherently Aspectual (Present) Tenses

*4.1 (*Ø) Three Questions*

The attractiveness of positing a zero (grammatical) element is enhanced in a model, like Cognitive Grammar, in which a meaning can be assigned to that element, because all expressions, including

zero, are taken to be symbolic. That meaning in many cases can be formulated in terms of the indication of some type of conceptual 'immediacy', following a general pragmatic principle that that which is obvious need not be formally expressed. This turns out especially relevant in the clausal realm, where 'zero' is traditionally associated with reference to the time of speaking, as indexed by a present tense. Presentness is a form of temporal immediacy, and, in line with the more schematic characterization of grounding predications as expressing epistemic meanings, the meaning of a present tense can also be analyzed in terms of what kind of knowledge/certainty it expresses (Langacker 2011). In English, the contrast in the present-time paradigm between a simple and a progressive form can at least in some cases be analyzed as referring to different types of knowledge (structural vs. phenomenal, cf. Goldsmith & Woisetschlaeger 1982), with the simple present again associated with a type of epistemic immediacy: 'Immediate reality', the sphere of knowledge constituted by directly observed events with a high degree of epistemic control, is the direct basis for the modal assessment of a proposition expressed by a finite clause marked in the simple present.[9]

The meaning of the English present tense (and its relation to the progressive) has been discussed in a number of publications (e.g., Brisard 2002; Langacker 2001, 2011). Here, I will use that discussion to address three questions that directly relate to covert grounding in the clausal realm and that in my eyes are still open for debate. They are as follows:

Q1: If a construction exhibits a certifiable *epistemic* meaning, can we then assume it has grounding status, even if it may occur in other contexts where it does not (absolute quantifiers, tense/mood-marked modals, aspect)?
Q2: Can we posit *units* (conventional collocations of grammatical markers) that may serve as grounding predications, e.g., periphrastic combinations of tense + aspect markers?
Q3: Should we assign aspectual values to tense marking, even in the absence of explicit aspectual forms? Does tense always come with an aspectual value (possibly underspecified)?

4.2 Progressive Aspect in Cognitive Grammar

On the standard account, the progressive creates an internal perspective on dynamic events, as diagrammed in Figure 20.2. The use of the progressive in English is intrinsically associated with reference to perfective, i.e., bounded dynamic, events.[10] This is symbolized by the explicit representation of a dynamic event's boundaries. With the progressive, these fall outside the aspectual immediate scope (IS_A) imposed by the construction, which is a way of representing the zooming-in effect that is taken to characterize its use. As with all cases of aspect marking analyzed in Cognitive Grammar, the actual grounding/reference (in bold in the diagram) is brought about by the tense

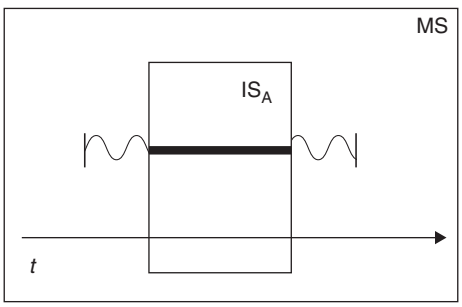


Figure 20.2 Progressive
Source: Adapted from Langacker 2001: 259.

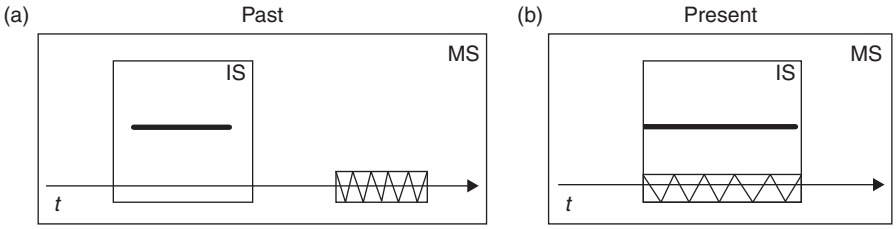


Figure 20.3 Past and present progressive
Source: Langacker 2001: 260.

marking, which relates the process to the time of speaking. If the tense is past, the configuration in Figure 20.3(a) applies; if it is present, then it looks like Figure 20.3(b).

Again, the profiled process in bold is grounded in the background (the maximal scope MS) by the relation to the ground (the rectangle situated on the timeline), as indicated by the tense. The aspectual scope IS does not contribute to individuating the event *per se*. In this sense, the present progressive is an example of a periphrastic construction that should not have grounding status in itself.

In English, the present progressive is grammatically obligatory for all references to singular ongoing events coinciding with the time of speaking (cf. *I'm eating / *eat an apple right now*). In addition, it can be used to mark repetition, incremental manifestation, etc. These uses, which are all purely temporal, can be systematically contrasted with uses of the simple present, which refers to ongoing events right now in surprisingly few cases. Instead, the simple present seems to be used in a majority of instances to express stable forms of knowledge: reference to states/habits, or to events over which the speaker exerts a considerable degree of epistemic control, e.g., future (scheduled) events with high predictability.[11] In contrast, the present progressive is typically used to refer to singular events whose occurrence, whereas real, is not construed as particularly informative about the structure of the world. That is why Brisard (2002) has proposed a schematic characterization of the simple/progressive contrast in the English present-tense paradigm in terms of the 'structural' vs. 'contingent' quality of a state of affairs, whereby structural knowledge (*the engine doesn't smoke anymore*) describes "how the world is made such that such things may happen in it" (Goldsmith & Woisetschlaeger 1982: 80) and contingency (phenomenal knowledge, as in *the engine isn't smoking anymore*) refers to "what is happening, what we might see if we simply opened our eyes" (Goldsmith & Woisetschlaeger 1982: 81).[12] The meaning of contingency expressed by the present progressive, it is further argued, manifests itself very prominently in contexts that are construed as atypical/surprising,[13] and not only within the present-tense paradigm. This is not just true for English, as the examples in the following subsection purport to demonstrate.

4.3 Non-Temporal Uses of Progressives: A Case of Grounding?

In French, the progressive construction *être en train de* 'be in the course of' is much less grammaticalized than its English counterpart and accordingly used much less frequently as well. When it *is* used, however, it tends to be reserved for the expression of events that are somehow remarkable, in the sense of out of the ordinary, as in example (4b):

(4) (a) ?? *Il* est en train de *bien* lire.
'He's reading well.'
(b) *Il* est en train de lire *de travers.*
'He's reading aslant/askew.'

The use of the construction with events that are considered 'normal', as in (4a), comes across as odd, even if objectively the event (an ongoing process coinciding with the time of speaking) would on the basis of its purely temporal qualities qualify for progressive marking in English.

Similarly, Dutch seems to turn to the progressive, which is also less grammaticalized than in English, for the (grammatical) expression of irritation and other negative emotions, which more typically than not (in a 'normal' person) arise with unexpected events or ones that shouldn't occur. In example (5), the motion verb *lopen* 'walk' is used to express progressive meaning:

(5) *was d ook één jongen in 't team en z en dat vind ik nou wel een beetje irritant worden want die* loopt *altijd heel erg* te roepen *van uh als je iets fout doet*

'there was also one guy in the team and I think it's getting a little annoying because he's always shouting if you do something wrong' [lit. he always walks to shout] (CGN NL Dutch; Anthonissen et al. 2019)

Whereas the temporal interpretation of current ongoingness is also relevant here, the construction, along with related ones in Dutch involving *aan het* 'on the' and other grammaticalized posture verbs, is in addition very much associated with a more intensive (usually negative) qualification of the state of affairs referred to.

The progressive can also be used as a modified expression of certainty/assertion, again epistemically qualifying the profiled process. Tentative uses as in the German example in (6) illustrate a mitigating effect:

(6) [Renate Götschl, an alpine ski racer:] "*Die Strecke ist interessant, […] hat Wellen, ich* bin *noch ein bisschen* am Probieren*", meinte die Steirerin, die bisher in der Abfahrt ebenfalls hinter ihren Erwartungen geblieben war*.

'"The ski slope is interesting, […] has curves, I'm still testing it a little", said the woman from Styria, who hitherto had not lived up to expectations in the downhill race either.' (Anthonissen et al. 2016)

But the certainty/assertion can be heightened as well, as with many so-called interpretative (Ljung 1980) uses of speech-act verbs, illustrated here by an example from Western Armenian:

(7) *O č', č'unim, k'ësem* kor*, anpayman k'uzes ëllay, č'unim!*

'No, I haven't got any, and I'm telling you, you absolutely want there to be some, and I haven't got any!' (Donabédian-Demopoulos 2012: 9)

The verb *kor* 'tell' is marked here in the progressive for reasons of emphasis: either because it is a repetition of a previous reference to the same act of telling (that could point to irritation) or because the speaker wants to attract the audience's attention to what 'they are *really* saying'. Of course, this particular use is very common in English as well. Example (8) features a verb of communication, *talk*, used both in the simple present and in the present progressive (to refer to the same event) within the same conversational turn:

(8) [In a discussion between a professor and his students about Jesse Jackson:] *Well, he says minorities. He's smart, he* talks *about minorities. But he*'s *really* talking *about African Americans*. (Santa Barbara Corpus of Spoken American English, Part 1; De Wit & Brisard 2014: 52)

The semantic difference with the preceding simple-present report of the same event (talking) is not aspectual here. The speaker is epistemically qualifying the immediately preceding statement about

Jesse Jackson (which is qualified as appearance) by means of the progressive (which reveals its 'real' status; cf. the typical use of accompanying epistemic expressions like *really* or *actually* with these interpretative uses). Note that the forms *says* and *talks* can be analyzed here as habitual simple presents. The progressive variant has the same habitual reference, but again, its use is not temporally motivated, in the sense that this is not meant, e.g., as a temporary habitual.

The kinds of qualifications we have noticed in the examples above and abounding in the literature on progressive marking[14] can plausibly be described as being modal in nature, as in one way or another they always relate to the epistemic status of a situation. Unlike with tenses and (epistemic) modals, a feature like contingency does not so much define another region in the 'basic epistemic model' (Langacker 1991: 242) used to characterize the meanings of the core clausal grounding predications as it points to a property of an important subset of events occurring in (immediate) reality:[15] Although real, they are characterized as non-necessary, i.e., not following (necessarily) from the structure of the world. Whenever the use of a (present) progressive is not purely temporally motivated, it might be proposed that the expression of contingency is the prime motivating factor and that the construction acquires something of a (semi-)grounding status.

4.4 Sm Tentative Answers

Given that a construction like the present progressive is more or less systematically used (in English) as one member of a minimal pair, with the simple present as the other member and each construction identifying a different subset of situations in the same region of immediate reality, why would we deny grounding status to one member of the pair when it clearly participates in the same functional division of labor involved in referring to present situations? The argument against grounding status will be a formal one, viz., that as a marker of aspect, the progressive is itself grounded by tense, but we have seen before (cf. section 3) that periphrastic constructions (like certain German modals) can be analyzed as being functionally equivalent to non-periphrastic ones. And given the recent emphasis on seeing grounding as a semantic function, the answer to Q1 above might be considered positive. This is not to say that an aspectual construction like the progressive should be analyzed as a grounding predication *by definition*: Just like with the English absolute quantifiers, it can be said to acquire this function in contexts where there is no other overtly realized grounding predication. In English, the obligatory use of the progressive with dynamic verbs can be seen as a clear indication of the special grammatical status of this construction in the present-time paradigm. In the other temporal paradigms, past and future, the case for treating the progressive as a kind of grounding predication is much weaker, nor does a present progressive necessarily qualify as such in other languages where the simple present is indeed formally marked (if only because its form is different from a bare infinitive in the language). However, the zero marking of a verb form in the simple present in itself is not the real reason why a present progressive can develop as a grounding predication in a given language. As suggested above, there should be a systematic division of labor between the simple and the progressive variant of a present tense before the latter can be said to participate in the paradigm of grounding predications. And this is exactly what happens in English, where the simple present evolved in such a way that it has come to be reserved for reference to states (broadly conceived) and the present progressive is obligatory for the description of ongoing dynamic events.

Languages where the simple present can readily be used to refer to ongoing dynamic events (compare English: *What is she doing? She is brushing/*brushes her hair*, Dutch: *Wat is ze aan 't doen? Ze borstelt haar haar*, and French: *Qu'est-ce qu'elle fait? Elle se brosse les cheveux*) tend to feature a progressive construction, if they have one, that is typically (much) less grammaticalized than in English. In these languages, uses of the progressive that are not temporally motivated but rather modally/epistemically are typically more notable/marked. For instance, in Dutch one does not need progressive marking for referring to current events, and so in many cases its use is not

restricted to expressing ongoingness and frequently comes with a speaker's wish to express an additional meaning that is arguably modal in nature, because it somehow qualifies the (epistemic status of the) event referred to. This explains the relative conspicuousness of the progressive construction in contexts where the speaker expresses surprise/irritation or, more generally, wants to signal the atypical nature of an ongoing event. Now, what looks like a paradox, i.e., the more clearly modal motivation for using a progressive in a language where it is a marked choice and not a true grounding predication, should not be one: The lower degree of conspicuousness of its modal motivation in English is due to the highly grammaticalized/obligatory status of the progressive in the present-time paradigm. Both in English and in languages with a less grammaticalized progressive, the construction can be analyzed as involving a semantic network with one common schema, subsuming a notion of contingency, and various elaborations, some primarily temporal and others explicitly modal (along the lines of what has been proposed for English in De Wit & Brisard 2014).

It is not unreasonable to contemplate the possibility of a grounding predication consisting of more than one grammatical marker (e.g., a periphrastic combination of a tense or mood and an aspectual or modal marker). In some cases, this might allow for a substantial expansion of a language's grounding paradigm, as with the German epistemic modals or any language in which a new perfect construction has taken over many functions of an old preterite. However, the potential recognition of periphrastic constructions as conventional units with grounding status (Q2) does not necessarily answer the question how constructions should be analyzed that appear to combine with a zero marker, as with absolute quantifiers and the present progressive in English. Rather than seeing those in terms of units as well, the current conception in Cognitive Grammar is to deny the existence of a zero construction and propose that another construction can fill in in the absence of a canonical grounding predication. Strictly speaking, this would imply that there is no simple-present construction in English and certainly not one that is marked by zero (* *I drink-Ø*), just like there is no indefinite zero article. Instead, the typical interpretation associated with the use of an English simple present (reference to 'states') can be seen as an inference based on the absence of overt grounding: On analogy with the maximally informative interpretation of bare nominals (as in *I like dogs*, i.e., all instances of the 'dog' type), the speaker's decision not to ground a clause overtly or, in other words, the presence of a base/uninflected verb form invites an equally maximally informative interpretation, that of a state of affairs not only holding at the time of speaking but persisting in time.

Finally, the typical association of the simple present in English with stable states of affairs, i.e., states, suggests that, for various historical reasons, this tense has acquired a specific aspectual value and can be called perfective (Q3; see De Wit 2017). Verbs 'marked' by the English simple present convey situations that are structural rather than contingent. Other languages can have aspectually *underspecified* simple-present forms, in which case they may exploit the epistemic meaning of the optional progressive construction more fully. A strong argument in favor of the perfective value of the English present tense is its behavior with performative verbs, where it describes a speech act that is instantiated throughout the time of speaking (see Bary 2012). In fact, De Wit et al. (2018) demonstrate that there is a pronounced tendency for languages to select that aspectual form for performatives, whether perfective or imperfective, that is generally used to refer to stable states and highly predictable events, thus confirming the strong link between the particular use of the simple present in English and the structural qualification of a state of affairs. Most generally, then, we may say that the English simple present is used to refer to states of affairs that are fully and instantly identifiable, either on the basis of their subinterval property (with states, which can be fully verified based on a random segment) or because their virtual representation suggests full epistemic control at the time of speaking. If a tense, *qua* grounding predication, comes with its own aspectual specification, it should not come as a surprise that its aspectual counterpart, the imperfective progressive construction, functions at the same level, even if it is (analyzed as) formally periphrastic.

5. Conclusions

The major evolution in Cognitive Grammar's account of grounding is at once one that stresses (more insistently) the primary nature of a grammatical category as the implementation of a semantic function and one that acknowledges (more overtly) the amount of variation that exists in how languages organize this implementation. It allows for intermediate cases and replaces a story of zero with one where non-grounding constructions may be functionally augmented in certain contexts. The result is an analysis that presents itself as more unified, in that it can accommodate more readily different types of (semi-)grounding constructions, and which may also offer a better explanation of historical evolutions of grounding paradigms. The basic parallelisms between nouns/nominals and verbs/finite clauses, which served as the starting points for Cognitive Grammar's explanation of grounding, are characterized in more detail as relating to different strategies available for achieving reference and establishing coherent discourse. For the theory of grammar, this account of grounding reinforces the general assumption in cognitive linguistics that apparently problematic linguistic phenomena are best analyzed as the possibly implicit structural consequences of basic functions that need to be realized (because they concern basic aspects of human experience), in line with the dynamic conception of a natural (as opposed to formal) grammar as a set of cognitive routines that are essentially schematic and 'figurative'.

Notes

1 This label is not an established reference in Cognitive Grammar, but one that I made up purely for rhetorical purposes. It is, however, partly prompted by Langacker's explicit recognition of a revision of earlier accounts of grounding in recent publications.

2 In Cognitive Grammar, a thing is the conception of any region in some domain of instantiation, prototypically though not exclusively that of space (e.g., *apple*, but also *democracy* and *running*). A process is the conception of a temporal relation, i.e., a set of interconnections among conceived entities distributed through a continuous span of conceived time. Things and processes represent the semantic pole of nouns and verbs, respectively.

3 The table should be read as follows: English nominal grounding predications include definite *the* and *this/that* (and their plurals), indefinite *a/ø*, and the quantifiers *some, sm* (unstressed *some*), *most, all, no, each, every*, and *any*. Clausal grounding is done in English by the present and the past tense and by the morphologically defective modals *may, will, can, shall*, and *must* and their past-tense forms.

4 Not impossible, but in need of a special type of context to make sense (e.g., to start a narrative). The *passé simple*, the original form dedicated to such uses, has become obsolete in modern French.

5 More generally, it is the quantificational expressions in Table 20.1 that appear to be less stable in languages, as they are often the newer elements in the language (as grammatical constructions) and the processes of grammaticalization affecting them are less likely to have reached some form of completion.

6 Relative quantifiers also count as expressing strong epistemic control, on a par with expressions of definiteness, because they either equate a referent with the maximal extension of its type (universality) or indicate a proportional relation to it. Both strategies lead to interpretations of (relative) uniqueness, which is why they are true grounding predications.

7 The third option, *a lady's camera*, is meant here as referring to the camera of an unspecified lady, not to a type of camera (in which case the grounding would simply be done by the indefinite article and *lady's* would have an adjectival function).

8 The benchmark with modal grounding predications can be described as the acceptance of the grounded process in known/conceived reality. This follows from the fact that, with processes, the issue is existence rather than identification (cf. section 2). When used epistemically, the different modals specify the different degrees of confidence to which this can be done.

9 At least, according to Langacker (2011), if the clause contains a modal; otherwise, i.e., for clauses grounded by 'tense' alone, the temporal meaning of (actual or virtual) coincidence with the time of speaking is said to suffice. Whereas some specifics of the analyses proposed by Brisard (cf. below) and Langacker may differ, they agree in positing a temporal meaning for prototypical uses and a modal one at the most schematic level of analysis.

10 This is why it is specifically a progressive, and not purely an imperfective. The perfectivity of the designated process is presupposed by the use of a progressive, which imperfectivizes that process as in Figure 20.2.

This is evidenced by the dynamic re-interpretation of imperfective states when co-occurring with the progressive in cases of aspectual coercion, as in *I'm loving it*.

11 In cases such as these and conceptually related ones, Cognitive Grammar assumes that a 'virtual' (rather than an 'actual') instance of the process is aligned with the time of speaking, verifying its temporal definition of the English present tense as specifying "that an instance of the profiled process occurs and precisely coincides with the time of speaking" (Langacker 2011: 56).

12 The first statement, in the simple present, boils down to a confident claim about the engine being repaired which needs no empirical confirmation. The second is just an observation, and "you would certainly have to start the engine first" (Goldsmith & Woisetschlaeger 1982: 81).

13 In De Wit et al. (2020), these meanings are related to a general notion of 'extravagance' that can be used to describe what situations reported by a progressive have in common. Extravagance has been linked to diachronic processes of grammaticalization: Innovative speakers want to be noticed by using a new construction or an existing one in a striking new way, and get copied. This happens especially when those speakers are more than usually involved in what they are describing, for instance (or rather, typically) when the situation 'stands out' in one way or another.

14 Another well-known example from the literature is that of simple-present vs. progressive futurates (e.g., *I leave/am leaving tomorrow*), whose descriptions lend themselves easily to a characterization in terms of (non-)contingency.

15 Progressives can also occur with past- and future-tense marking: In those cases, the relevant epistemic spheres are (non-immediate) reality and irreality, but the property of contingency for the events described is still taken to apply. It is likely, though, that the modal uses of progressives primarily start out in the present-tense paradigm, because it is in the present that the simultaneous observation and description of ongoing perfective processes leads to a number of paradoxes/problems that warrant special attention to their epistemic status (cf. De Wit 2017).

Further Reading

Langacker, R. W. (2008). *Cognitive Grammar: A basic introduction.* Oxford: Oxford University Press. (As the title suggests, an introduction to Cognitive Grammar. Chapter 9 focuses on grounding and introduces two of the key notions in the revised account: grounding as a semantic function and basic grounding strategies.)

Langacker, R. W. (2016). Baseline and elaboration. *Cognitive Linguistics*, *27*, 405–439. (This is a more general description of the account of semantic functions that is currently being developed in Cognitive Grammar.)

Related Topics

cognitive grammar; construal

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21
HUMOR AND COGNITIVE LINGUISTICS

Salvatore Attardo

1. Introduction and Definitions

This review[1] is focused on works concerning humor, broadly defined to encompass all types of phenomena that generate mirth, according to the usual sense established in Raskin (1985; see Attardo 2020a, for discussion). However, for reasons of space, I have not attempted to include a specific discussion of irony and sarcasm, or of any other genre of humor.

Cognitive Linguistics (CL) is defined as approaches influenced by the work of Langacker, Lakoff and Johnson, Fauconnier, Goldberg, Evans, and others. This is in contrast with other views which construe "cognitive" as "related to cognition" (e.g., Dynel 2018) which should then logically coincide with psychology (or at least with cognitive psychology).

Concretely, this means that I will consider only those theories that explicitly use concepts and ideas borrowed from cognitive linguists (as a school). For example, I will not consider Giora's (2003) Graded Salience in this survey, not because I do not think it is a good theory (on the contrary, I am a supporter of the theory and have used it myself; Attardo 1997), but Graded Salience, despite having been co-opted by CL—it is mentioned in practically all discussions of CL and humor—is not worded in terms of CL, and is a semantic/pragmatic psycholinguistic theory of processing. Likewise I will not consider Yus (2016) or Ritchie (2018), who both could claim to belong to a broad "cognitive" framework.

The relationship between CL and humor studies has been described as a "long-lasting flirtation" (Piata 2017: 126) that never goes anywhere: "There is certainly mutual interest and also a well justified potential for this to grow into a fully developed romance, yet this is not actually the case" (Piata 2017: 126). However, the reason for this is not, as Piata imagines, in what is a very creative metaphor for academic discourse, the presence of a "a long-term 'significant other'" (i.e., a prevalent alternative model, the General Theory of Verbal Humor, on which more to come) but rather the way the field has developed, as I hope to show in what follows.

2. Historical Perspectives

I think it is fair to say that CL was born of Lakoff and Johnson (1980) and Langacker (1987). However one should not neglect construction grammar (Goldberg 1995). Just from these names it should be clear that there is a significant connection with the "generative semantics" camp in the

so-called "Linguistics Wars" (Harris 1993) in which both Lakoff and Fillmore figured prominently, and Langacker more "peripheral[ly]" (Harris 1993: 251). The Semantic Script Theory of Humor (SSTH; Raskin 1979, 1985) comes from the same generative semantics background.

For example, Raskin, in 1985, edited a roundtable in *Quaderni di semantica* about Script/Frame semantics, featuring, among others, Charles Fillmore. Fillmore's article on frame semantics, from the roundtable, is widely quoted within cognitive linguistics. I don't have the space to make a full case for this[2] but I trust it is clear that Cognitive Linguistics and the SSTH and the General Theory of Verbal Humor (GTVH),[3] which is an extension of the SSTH, share a set of "parents".

In Attardo (2006: 359, n.2) I made the claim that the SSTH and CL theories "have more in common than most people seem to realize". In Attardo (2002) I claimed, somewhat tongue-in-cheek, that the linguistics of humor of the SSTH/GTVH ilk was "cognitive stylistics" all along and explored one aspect of the similarity: the use of a frame/script-based semantics, which uses prototypical senses. As we will see below, the terminological difference between scripts and frames is non-existent. Another aspect, not particularly explored in Attardo (2002), is that the GTVH makes use of mental spaces (or mental-space-like constructs) to create a dynamic representation of the text and of the interconnections between the characters. There is a third aspect, far more profound than the previous two, and which to the best of my knowledge has not been discussed before. Raskin's approach to semantic theory is quite unique in that he explicitly denies the presence or even possibility of a semantic/pragmatic boundary. CL analyses of meaning likewise deny the distinction between semantics and pragmatics: "The distinction between semantics and pragmatics (…) is largely artifactual, and the only viable conception of linguistic semantics is one that avoids such false dichotomies" (Langacker 1987: 154).

So, if CL approaches and the SSTH/GTVH share such significant theoretical aspects, what motivates the rivalry, described by Piata, who correctly senses a certain animosity toward the GTVH, for example in Brône et al. (2006). It is possible that, as Attardo (2006) claims, the proponents of CL approaches to humor ignored the significant differences between, say, Minimalism and a semantic-pragmatic theory, and so in their rejection of all things Chomskian ended up throwing out the SSTH baby with the bath water of generativism.

Are cognitive linguistic theories and humor theories "incomparable" (Müller 2015: 114)? Since they use the same level of concepts (e.g., frames, mental spaces, etc.) there is no reason to assume that they operate at different levels of abstraction or formalization, although obviously the terminology is going to be different (frames vs. scripts). Granted there are real differences between CL and the SSTH/GTVH. For one, the SSTH/GTVH are adamant that their scope is competence, whereas CL is just as clear that it proposes a theory of usage (or is usage-based). However, one could argue that the differences are not that significant, once one considers competence/performance to be a continuum of abstraction (Attardo 2020a). More importantly, as we will see below, the CL approach to meaning may be truly alternative to the inferential approach used in the GTVH. This has not stopped several authors from suggesting that the GTVH and CL approaches to humor could (or should) be combined.

Howell (2007) examines three passages from a humorous novel about the fall of the Berlin wall and life in East Germany (*Helden wie wir*, by Thomas Brussig, 1995) utilizing Coulson's blending and frame-shifting approach first and then the GTVH.

Schubert (2018) on sitcoms uses both CL and the GTVH, augmented by blending as a Logical Mechanism. He examines the first 13 episodes of three US drama series (*Dexter*, *Breaking Bad*, and *House of Cards*), an original choice since he notes that studies of humor in TV have mostly focused on comedies, such as *Friends*, for example (Dore 2015). Dore also uses a blend of CL and GTVH tools, including specifically logical mechanisms. However, what is probably the most significant work that blends (pun somewhat intended) CL and the GTVH is Antonopoulou's stylistics analysis (see below).

Ultimately, however, regardless of the historical roots of the issue, the problem Piata correctly senses boils down to the fact that CL has struggled to grapple with some fundamental metatheoretical issues, discussed below.

First and foremost, the presence of a given linguistic phenomenon in a text may or may not be related to its being humorous. Metaphors are a good example: some metaphors are humorous and some are not. You may have metaphors in texts that are not humorous. Then clearly there are two distinct problems that both require explanation: (a) why is a humorous metaphor humorous, and (b) if there is a metaphor in a humorous text, is the metaphor the cause of the humor or not (cf. Muller 2015)?

The second problem is related to the first. Take the idea of blends. Obviously some blends are humorous. Just as obviously, some of them are not. Consider now Jablonska-Hood (2015), who wants to explain humor in terms of blends (or conceptual integration). If her account were successful,[4] this would introduce a logical problem. If blends explain humor then why are not all blends humorous? There needs to be something else, besides the blend, that explains why some blends are humorous and some are not. Which is tantamount to nullifying on a logical basis the idea that humor equals blending. Not all cognitive linguists who have dealt with humor are unaware of this issue, see for example Bergen and Binsted (2004) and the discussion below.

3. Critical Issues and Topics

3.1 Frame Shifting

Coulson introduced the idea of frame shift as an explanation of humor and jokes in particular (1996, 2001). The concept is identical to Raskin script switch: the speaker goes from one frame/script to another. Both Fillmore and Raskin use the term as an umbrella term to subsume the terminological mess of the mid-1980s (see Attardo 2020b for a review). Coulson (2001: 20) also adopts Fillmore's use of "frame" as a "cover" term, for a variety of constructs that include scripts. It was also argued that Coulson's conception of frames was more "dynamic" (because they are built on the go in mental spaces; e.g., Brone et al. 2006: 207), but Attardo (2001) also introduced, independently, the idea of dynamic scripts built within a mental-space-like textual representation.

Barcelona (2003) is clear that script switching (in Raskin's sense) is equivalent to frame shifting:

> humor comprehension involves some kind of adjustment or change from the cognitive script or frame (in Fillmore's (1985) sense) that supports the initial, straightforward interpretation of the text of a joke right before the punch-line, to a new script or frame.
>
> *Barcelona 2003: 82*

Barcelona (2003: 86–87) conflates frame blend with Raskin's script overlap, i.e., the idea that the text must be compatible with two scripts/frames. Likewise, Brône (2017: 252) comes to the conclusion that frame shifting and script switching are "largely identical".

The significance of Coulson's decades-long work on frame shifting lies in the neuro- and psycholinguistic work that she has conducted which essentially validates the model and converges with the research on humor in neurolinguistics. Coulson summarizes her work effectively in Coulson (2015), so I will present only some highlights. Coulson finds that there is a "processing cost associated with frame shifting" (Coulson 2015: 174) which results in increased reading times for humorous sentences. Furthermore, in an eye-tracking experiment, "participants were more likely to regress when they encountered joke endings than straight ones" (Coulson 2015: 175). Another study finds the well-known N400 and P700 (event-related potentials), which have been associated with incongruity and resolution, respectively. Coulson addresses the neurolinguistics of humor, also consistent with the model and the idea of embodied cognition also playing a part in the

processing of sentences. On the neurolinguistics of humor, see also Vrticka et al. (2013), Chen et al. (2017), and Rodden (2018).

Another aspect is more complex to explain. Coulson's psycholinguistic model of semantic processing is significantly different and possibly antagonistic to the approach utilized in script-based semantics. A serious, in-depth, comparison between the two models has not been attempted, to the best of my knowledge. Because of the level of detail provided in Coulson (2001) the comparison is feasible and meaningful, contra Veale (2008: 75), who argues that Coulson's approach is too vague to be compared. Likewise, a comparison with Ritchie's (2018) approach would be interesting. However, this is not the only reason why Coulson's detailed (2001) account is valuable: by providing a specific description of how to arrive at the conclusions she draws, her account is infinitely more useful than, say, Koestler's (1964) which one often finds quoted, which is purely impressionistic and does not provide any replicability.

3.2 Mental Spaces

Brone (2008) discusses hyperunderstanding, introduced in Veale et al. (2006) in the context of metal spaces. Hyperunderstanding is defined as follows:

> Hyper-understanding is viewed as the recognition of the subtleties of conceptual meaning. This recognition can be exploited in verbal witticisms to turn the tables on one's adversary by revealing the potential weakness of the other's linguistic choices.
>
> *Brone 2008: 2031*

But it is best exemplified with this example from the television comedy *Blackadder* provided by Brone:

Darling: You'll regret this, Blackadder. You'd better find the real spy or I'll make it very hard for you.
Edmund: (Protesting) Please, Darling—there are ladies present.

Brone 2008: 2032

This can be analyzed in some detail to reach the conclusion that "By adopting a different interpretation of these two elements [the pronoun "it" and "hard"] than the one intended by the first speaker, the second speaker undermines the first" (Brone 2008: 2032). So far, the analysis would reduce to simple ambiguity (as can be seen from the list of sources of ambiguity, the "key elements" exploited by hyperunderstandings). However, Brone continues to note that there is an implicit echoic parallelism between the utterance by Darling and the implicit re-utterance by Edmund in a different mental space, in which Edmund Blackadder rebukes Darling for being ungentlemanly. This recontextualization affords the speaker to subvert the power relations in the exchange. Thus, in the example above, someone making a threat has a modicum of power over the threatened person, but by recontextualizing the situation as an offer of sexual favors, the power dynamic is reversed. This analysis of the echoic parallelism in terms of mental spaces is, to the best of my knowledge, an original contribution to humor research.

3.3 Blending and Conceptual Integration

Fauconnier (1997: 183, 185) analyzes a humorous remark in terms of a "creative online blending" (as opposed to a standardized blend) and notes that "humor makes abundant use of blends". Coulson and Oakley (2003: 52) define blending as the combination of "dynamic cognitive models in a network of *mental spaces* (Fauconnier 1994) or partitions of speakers' referential representations"

(emphasis in the original). The prime application of blending to humor, Coulson's frame-shifting model (1996, 2001) which incorporates blending, has already been examined above, so we move on to other conceptualizations.

3.3.1 Double Grounding

Fauconnier and Turner (2002) describe multiple blends, i.e., complex blends that have more than the standard four spaces. Within this context, and even using one of their examples, Feyaerts and Brone (2002: 321) introduce the idea of double grounding, i.e., "conceptual integration, in which one element in the blend is meaningfully linked to two different input spaces, thus creating a humorous effect". The concept is more easily exemplified with an example from Brone and Coulson (2010: 215): "Russia takes the froth off Carlsberg results." The headline implies that the sales of Carlsberg in Russia have negatively affected the overall results for the target company. As per Brone and Coulson's explanation, we have a blend between a source (the UP is more and DOWN is less conceptual scheme) and a first target (the diminished sales that are less than forecast) and a second (hence double grounding) target that equates Carlsberg with its most salient product, beer. The resulting blend then is that since froth goes up, the disappointing sales are equated to taking the froth off, i.e., going down. Interestingly in Feyaerts and Brone (2002: 320) the "non-conventionality" of the blend is attributed to the "distance" between the concepts. See more below on the distance theory. Another application of blending and incongruity-based approaches to cartoon data is Abdel-Raheem (2018).

The somewhat deflating summary shows that double grounding is just a type of ambiguity involving the literal and figurative meanings of a (complex) metaphor. If that is the case, then the role of double grounding is to "bring onto stage" the ambiguity and to "motivate" the association, via a metonymy. Likewise, Marín-Arrese (2008: 16), who analyzes humorous cartoons, speaks of metonymy, metaphor, and blending as "cues, as 'unpacking devices' in the interpretative processing of cartoons". On metonymy, see also Tabacaru and Feyaerts (2016).

Dynel (2011) argues that blends are humorous if they meet the requirements of humor (simplifying, incongruity, and resolution), which boils down to saying that a blend is humorous if it is independently humorous and thus the blending per se is neither humorous nor not. However, although Dynel does not say this, such an analysis would be compatible with the hypothesis that blends, and other cognitive phenomena, are logical mechanisms.

3.3.2 Trumping

This humor strategy has been the focus of significant attention by Veale (2003); Brône et al. (2006); Brône (2008, 2012, 2017); Feyaerts (2006); and Veale et al. (2006). It is defined as a subtype of "adversarial humor" and more specifically as a "multi-agent language game that generates its humor through subversion of the linguistic forms of the exchange" (Veale et al. 2006: 306) or more colloquially as "turning the tables" on one's linguistic opponent. However, not any turning of the tables will do, it has to be accompanied by the use of "parallelism" because trumping is "impromptu wit whose humor arises, at least in part, from our appreciation of an agent's verbal mastery" (Veale et al. 2006: 312). Thus in the following example, attributed to Mrs. and Mr. Churchill, after his defeat in 1945:

Mrs. Churchill: Perhaps it is a blessing in disguise.
Mr. Churchill: Well, it must be a bloody good disguise then.

In this example, the parallelism consists of the reprise, to use a musical term, of the standard metaphor "blessing in disguise" in the second turn (Veale et al. 2006: 313).

Veale et al. (2006: 307) note the connection with the aggression theories of humor, but Hamrick (2007) shows that the same linguistic mechanisms at play also apply to non-aggressive humor (see below) and therefore this is not a defining characteristic of trumping.[5] Veale et al. also claim that the use of the speaker's own "premises" by the hearer to trump them shows that "the speaker must surely be confused and inept, or at least, under-informed, to work from such premises" (Veale et al. 2006: 313–314). However, if we consider the Churchills' example above, it seems a questionable assumption. Consider now the example discussed in Hamrick (2007) and Attardo (2020a):

Customer: Can I get $100 cash?
Bank teller: Should I take it from your checking [account]?
Customer: No, take it from someone else's.

In this case, which is obviously a parallelism, given the reuse of the "take it from X's account" expression, there can be no question that the teller is inept, or misinformed, let alone confused.

The central aspect of trumping is the parallelism ("Parallelism is the signature character of trumping as a humor strategy" (Veale et al. 2006: 313)). What about the hearer rebutting the original speaker's turn? That seems questionable as well, since one can easily reword the examples above in a monologic form:

Churchill: "My defeat in 1945 was a blessing in disguise. A bloody good disguise, I might add."

as Veale had already noted (2003: 14; "self-trumping"), and in fact the parallelism can be removed as well:

Boss: You should have been here at 8:00 am?
Employee: Why, what happened at 8:00?

In sum, it is not clear if trumping, as defined by Veale et al., is a coherent category. Ultimately, that is a moot point, because the interest in the category is only justified by its generalizability (Veale et al. 2006: 308). Veale et al. go on to consider various construals (i.e., ways to present information) which include metaphor, salience, metonymy, "complex construals" (i.e., more than one construal is at work), and hyperunderstanding. Semino (2008: 114–116) analyzes a humorous visual metaphor in a cartoon and emphasizes the metonymic mappings that afford the satirical aspects of the text. Finally, it is worth mentioning that Veale (2008) suggests replacing the various conceptualizations of incongruity-resolution with a much broadened concept of figure-ground reversal.

3.4 Humor and Metaphors

Surprisingly, the interplay of humor and metaphor has not been a topic of great attention, at least not until recently. Krikmann (2009) is a broad review of the work in cognitive linguistics, psychology, and humor theory on the subject.

The ambiguity between the literal and figurative senses of a metaphor is a very common way of triggering humorous incongruity (Goatly 2012: 180–181). Consider an example in Goatly (2012: 176) here summarized:

> A car mechanic becomes addicted to drinking brake fluid. One of his friends confronts him and tells him that drinking brake fluid is very dangerous as the stuff is poisonous. "Don't worry", said the mechanic. "I can stop any time."

The two senses are clearly stop (drinking) and stop (moving) and the connection between them the metaphorical schema ACTION IS MOTION.

The most widespread approach is the distance theory, so called because it assumes that there is a "semantic distance" beyond which the linkage between the two domains in the metaphorical construal becomes "stretched" (i.e., too distant) and is therefore perceived as humorous. Often this is worded as paying attention to the similarities between the concepts (metaphors) or the differences (humor) between the concepts (Fónagy 1982; Morrissey 1989; Pollio 1996; Kyratzis 2003; Dynel 2009; Kang 2016). Ritchie (2005, 2013) asserts that metaphors come from frame shifting, but that this is done "differently" and by "subverting" the frames, but no definition of "subversion" is provided.

The distance theory has its roots in psychological research, usefully summarized in Martin (2007: 92–95), which shows that the greater the semantic distance (measured with Osgood's semantic differential (Osgood et al. 1957) and other methods), the greater the perception of humor. Kang's (2016) work on compounds is the closest methodologically to these studies, since they were developed on word pairs, to which compounds are very close. The main problem with distance theories is that no threshold or metric is provided to decide when two words or two domains are distant "enough" to be funny. Until that changes, the theory is largely impressionistic. I might add that this may happen very soon as new techniques to measure semantic distance in computational lexical semantics and ontology are being developed (see Meng et al. 2013; Mohammad & Hirst 2012; Mihalcea et al. 2006, for reviews).

Oring's (2003) view is that the difference between metaphors and humor is that in the latter there is a partial resolution of the incongruity of the mapping whereas the incongruity in metaphor receives a full resolution. On the incongruity of mapping, see Attardo (2015: 96). Müller (2015: 115) states that "humour (…) retain[s] an opposition between two concepts whereas (…) metaphor conflate[s]" them. Veale and Valitutti (2017) apply Oring's idea to the computational generation of humor.

Attardo (2015) comes to the conclusion that the category of humorous metaphor is not a coherent concept and that it is best understood as an umbrella term covering a variety of phenomena that cannot be reconciled under a single explanation. These include metaphors with funny referents, failed metaphors (e.g., domains mapped upon themselves), mixed metaphors, and metaphors that violate primary metaphor relations, for example by being over-specific.

Piata (2016) expands on Attardo's account of humorous metaphors by adding yet another category of humorous metaphors: recycled metaphors. These are defined as metaphors that are recycled intertextually humorously in memes. According to Piata (2016: 43), "their funniness does not lie in bringing together two incongruent domains but rather in exploiting conventional mappings in an incongruent way". The examples are quite interesting as they are parodies of metaphorical ads, such as GOVERNING A COUNTRY IS (LIKE) DRIVING A TRAIN.

Piata is non-committal about the explanation of what makes metaphor different from humor, but she claims that "affinity between humor and metaphor lies at the pragmatic/discursive level and relates to their evaluative function in discourse" (Piata 2016: 40), "humor and metaphor do converge in that they both share a common discursive function as mechanisms of evaluation and persuasion" (Piata 2016: 42).

4. Current Contributions and Research

4.1 Embodied Cognition

Embodied cognition is one of the central tenets of CL (see, e.g., Evans & Green 2006: 44–47). To use an example relevant to the present discussion, processing metaphors requires engaging in mental simulations of physical actions and that both activate the same neural pathways (Gallese 2005; Gallese & Lakoff 2005; Wilson & Gibbs 2007).

There have been claims that humor is best explained by such accounts. For example, Bergen and Binsted (2015) claim that imagery and constructions are central in humor and since they are part of

embodied cognition it follows that humor is part of embodied cognition. In other words, verbally expressed humor is embodied insofar as it is expressed in language which is embodied. Needless to say, this implies that non-humorous (serious) language is just as embodied.

Samermit and Gibbs (2016: 32) show that humor processing involves "embodied simulation processes". The idea that embodiment plays a significant role in humor is correct. Gibbs et al. claim that the embodiment comes from the connection with activities such as tickling. However, they seem unaware of the parallelisms with the theory of play and particularly the Batesonian approach that sees play as including a meta-signal ("this is play"). So, the claim of embodiment that Gibbs et al. make reduces to the long established fact that humor is play.

Bergen and Binsted (2015), Samermit and Gibbs (2016), and Gibbs et al. (2018) assume that embodiment is mediated (by language or by play), but there is another perspective that shows a direct causality between embodiment and perception of humor. For example, there is evidence that merely assuming the facial expression of smiling (for example by holding a pen in one's mouth) enhances the response to humor (Strack et al. 1988; Glenberg et al. 2005; Chang et al. 2014). Kaspar et al. (2016) found that holding a heavy clipboard affected differently the perception of humor for men and women: in men, the heavy clipboard enhanced the perception of humor, whereas in women it depressed it.

In Attardo (2018), I argue that sustained humor (humorous exchanges that last more than three turns) are in part fueled by the feeling of exhilaration (a.k.a., mirth) that arises when speakers engage in appreciated humor and possibly by the firing of mirror neurons triggered by the smiling or laughing facial expressions. In other words, the feeling of mirthful exhilaration is both the effect *and the cause* of sustained humor (as a person in a mirthful mood is more likely to produce more humor or join in the laughter). On smiling, embodiment, and mirror neurons, see, for example, Schilbach et al. (2008).

4.2 Stylistics and Construction Grammar

An important contribution to CL and the stylistics of humor comes from the work of Antonopoulou (2002; Antonopoulou & Nikiforidou 2009; Antonopoulou et al. 2015). In a nutshell, Antonopoulou and her co-authors suggest the revision of the GTVH's language knowledge resource to include idiomaticity and constructions.

Much of the brilliance of Antonopoulou's analysis is lost in summary, but an example may give a general idea of the argument. A clash in idiomaticity is the "count-mass noun reversal" (Antonopoulou 2002: 204) exemplified as follows:

> Anna Halsey was about two hundred and forty pounds of middle-aged putty-faced woman in a black tailor-made suit.

Antonopoulou provides a detailed analysis, summed up as

> Although (…) [an] incongruity seems to be encoded in the second half of the sentence starting with of, in fact its resolution depends on the reader realizing the reason motivating the switch, i.e. that she is so fat that she is 'more mass than count'.
>
> *Antonopoulou 2002: 204*

Bergen and Binsted (2004) also examine a construction, the X is so Y that Z, as in

> It was so cold, I saw a lawyer with his hands in his own pockets.

They conclude that none of the linguistic aspects handled by cognitive grammar is responsible for the humor of the construction and that the humorousness of the examples has to be explained by the incongruity/resolution and the aggression theories of humor.[6]

There is a consensus, among cognitive linguists and the GTVH proponents, that there is no humor-specific linguistic mechanism. For example, Bergen and Binsted state:

> *Independent of humor production or understanding*, language users have knowledge of polysemy, and metaphor. Entirely independent of linguistic abilities, they can perform imagistic, hyperbolic, and specious reasoning. In other words, scalar humor can be constructed from *used parts*.
>
> *Bergen & Binsted 2004: 10, my emphasis*

Veale et al. (2006: 334) concur: "we have observed that speakers exploit very general construal operations in the adversarial humor game (…) no humor-specific logical mechanisms are needed for a full semantic description of the trumping strategy". As does Attardo (2006: 357): "[The GTVH] consist[s] of combinations of ordinary cognitive mechanisms which all operate outside of humor".

5. Future Directions

There are several questions that remain open and are likely to see more work. The nature of humorous metaphors is an obvious one, as well as the broader question of whether the cognitive mechanisms identified by cognitive linguistics are logical mechanisms. Hamrick (2007) and Attardo (2007, 2015) suggested the hypothesis that "metaphors, blends, metonymies and similar cognitive phenomena may be a class of logical mechanisms" (Attardo 2015: 108). Barcelona (2003) is compatible with the idea, in the case of metonymy. Veale (2003: 2) flat out states that "metaphor (…) can itself be part of the logical mechanism that makes humour work", although he seems to have backed off the idea somewhat in subsequent publications. The list of construals that emerge in Veale et al. (2006: 333–334) matches many of the other CL analyses and of the logical mechanisms of GTVH, as Veale et al. note. Müller (2015: 116) and Dore (2015) are in favor of the idea. Schubert (2018: 169) concurs with the hypothesis, and illustrates it convincingly. If the Hamrick-Attardo-Dore-Schubert hypothesis is correct, it would have the nice side-effect of explaining why some metaphors or metonymies are funny and some are not: simply, they are funny only if they are the logical mechanism of an instance of humor.

The embodied nature of humor and humorous exchanges is also likely to be a prominent topic in future research, especially as more research on multimodality in humor gets under way (for a synthesis of early work, see Gironzetti 2017). In general, the whole field of the linguistics of humor seems to be inflecting toward an interactionist ethnomethodological stance (see Attardo 2020a) and so it seems likely that CL will continue to explore the interactional aspects of construal as well.

All in all, it will be interesting to see whether CL and humor studies will "go steady" and move beyond the "programmatic" stage (Brône 2017: 262) or will it join the GTVH in a polyamorous relationship (along with Relevance Theory, Corpus Linguistics, and more psychological theories than we can count). Time will tell.

Notes

1 Other surveys of cognitive linguistics work on humor include Brone et al. (2006); Veale et al. (2015); Brone (2017); and Dynel (2018).

2 A serious discussion of the connections between script/frame semantics and cognitive linguistics would need to consider, besides the complex history of meaning representation in Artificial Intelligence, the influence of the psychological work on prototype theory (Rosch & Mervis 1975), the influence of case grammar,

and the influence of Gestalt theory on both approaches, at a minimum. On the relationship between early AI work and script/frame semantics, see now Attardo (2020).

3 The GTVH was presented in Attardo and Raskin (1991). It is an extension of the SSTH to include five other Knowledge Resources, which are various bits of information pertaining to jokes. For example, some jokes have a Target (i.e., an entity which is the butt of the joke, the person being made fun of). The GTVH has undergone a few revisions, primarily Attardo (2001). This is not the place for a complete exposition of the GTVH, for which see Attardo (2017) and Attardo (2020).

4 It is not. Her account is under-researched (ignoring other cognitive linguists working on humor), riddled with errors and misrepresentations, and ultimately she is expressing in a blending terminology analyses that could have been done outside blending theory.

5 Aggression is a defining feature in Veale et al.'s (2006) definition, but not in Veale (2003: 15); "in some cases trumping can actually support rather than undermine the goals of the speaker".

6 "We have outlined the linguistic basis for scalar humor (the X IS SO Y THAT Z construction) and the ways scalar humor plays on the pragmatic inference encoded in this construction. But our second fundamental question still remains—what is it about these different ways of toying with the entailed inference that is funny? (…) To answer this, we must look to humor research for theories of what makes anything funny" (Bergen & Binsted 2004: 10).

Further Reading

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Related Topics

standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues

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22
LINGUISTIC SYNAESTHESIA

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1. Introduction[1]

The term synaesthesia refers to a mixing of sensations, as suggested by its Greek etymology of *syn*, 'together' and *aisthēsis*, 'sensation'. More specifically, *linguistic* synaesthesia refers to the description of experience in one sensory modality with expressions from another sensory modality (as in *bitter smell*, combining taste and smell). *Neurocognitive* synaesthesia, on the other hand, refers to the neurological condition of overlapping brain functions among sensory modalities. In this chapter, we survey and summarize linguistic research on synaesthesia, addressing in particular the following issues:

- What is linguistic synaesthesia? It is usually taught in school that it is a figure of speech, that is often found, for instance, in the poems by Baudelaire or Rimbaud. But is it really a figure? And if so, which figure is it precisely?
- Are the sensory combination preferences observed in Ullmann (1957) and other early studies on synaesthesia in literary texts confirmed by a larger amount of data, coming from different text types and different languages?
- If such combination preferences are confirmed, how can they be explained? Should we look for extra-linguistic motivations, by searching a relation with the functioning of perception or even with neurocognitive synaesthesia? Or should we rather look for a motivation in culture and language?
- And what if there are discrepancies with respect to the preferred pattern, within a language or across languages?

Addressing these questions will allow us to highlight the role that linguistic synaesthesia plays as a window to observe the complex interaction between sensory perception, cognition, and language. As for language, we stress the importance of a close examination of the composition of the sensory lexicon of individual languages, which on the one hand reflects some aspects of the functioning of perception, and on the other may differ across languages. It seems that both aspects can be related to the characteristics of linguistic synaesthesia.

2. Synaesthesia in (Figurative) Language

Studies on synaesthesia in language most likely started with the highly creative sensory figures that are among the hallmarks of literary movements such as Romanticism and French Symbolism. The wealth of studies conducted on the topic in the first half of the 20th century was indeed primarily concerned with synaesthesia as a literary device (see references in Ullmann 1957). The use of synaesthesia in non-literary language was acknowledged, but only became the main subject of linguistic synaesthesia research in more recent years. This shift of interest has probably been favored by the concurrence of two circumstances: the "cognitive turn" in metaphor research, and the availability of large electronic corpora. The cognitive linguistic tradition, since Lakoff and Johnson (1980), stresses the role of bodily, sensory perception, in the grounding of metaphorical thought, and has brought unprecedented attention to metaphor in ordinary language use, where metaphorical thought pervasively surfaces. These factors may have contributed to a revival of interest in the sensory figure *par excellence*, that is synaesthesia, and its use in non-literary language. Because synaesthesia is rather rare in ordinary language (Marotta 2012; Strik Lievers & Huang 2016), the existence of large non-literary corpora, and of tools to automatically extract instances of synaesthesia, has been crucial in allowing such research (see section 3).

But what precisely is synaesthesia in language? Syntactically, it can appear in a variety of configurations, which may however usually be converted to an attributive relation (Marotta 2011; Huang and Xiong 2019). More specifically, the form that is by far the most frequent, especially in non-literary language, is that of a noun phrase composed of a noun and an adjectival modifier, as in *sweet melody*, *bitter smell*, *bright voice*. From a theoretical perspective, however, the status of synaesthesia requires some discussion, because there are different opinions on its definition. Three main positions may be identified in the literature (see Strik Lievers 2017; Winter 2019a: ch. 7): (i) synaesthesia is a metaphor, (ii) synaesthesia is connected to metonymy, and (iii) synaesthesia is not a figure.

Psychological and neuroscientific studies (e.g., Day 1996; Ramachandran & Hubbard 2001; Marks 2011) use the term "synaesthetic metaphor" to distinguish linguistic synaesthesia from neurocognitive synaesthesia, and in earlier linguistic and literary studies (among others, O'Malley 1957) synaesthesia was usually also called a metaphor. However, such label was not discussed or defined, and rather taken for granted.

Within the cognitive linguistic tradition, some scholars have challenged the "default" metaphoric interpretation by proposing that synaesthesia is related to metonymy. One view is that experiential contiguity is the mechanism that underlies both metonymy and synaesthesia. For example, if we commonly say that some *colors* are *warm* while others are *cold*, the reason lies in the association in experience between objects of given colors and their temperature: e.g., fire is hot *and* it is red/yellow, ice is cold *and* it is white/bluish (for similar considerations, also see the studies by psychologists such as Dromard 1908; Dirven 1985: 100; Marks 1990; Cacciari 2008). Another metonymic view is that synaesthesia, like other kinds of metaphors, has an underlying metonymic motivation. In the case of synaesthesia, such metonymic motivation lies in the reaction of perceivers: a *color* may be *loud* because both deviant colors and deviant sounds are metonymically understood from the similar effect they have on perceivers, that is, attracting their attention (see also Dromard 1908; Barcelona 2008; Ruiz de Mendoza 2020: 24–25).

The third analysis of the nature of linguistic synaesthesia holds that synaesthesia is not a figure at all (Rakova 2003; Paradis & Eeg-Olofsson 2013; Paradis 2015; Winter 2019a, 2019b). Under this view, the use of the adjective *sweet* as a modifier of *smell*, or *hot* as modifier of *chilli peppers*, is not metaphoric, or metonymic: what might seem cross-sensory-domain extended uses are in fact the linguistic reflection of the multisensoriality of our actual perceptions (Calvert, Spence, & Stein 2004; Sathian & Ramachandran 2019). That is, if *sweet* can equally well be used in *sweet taste* and in *sweet smell* it is because taste and smell are notoriously highly interconnected senses (see Auvray

& Spence 2008 for a review), and both a *stove* and *chilli peppers* may be *hot* because high temperature and spiciness get a similar neurophysiological response, and generate similar sensations (see Rakova 2003: 34–47; and Winter 2019a: 87–90, for extended discussion and references). *Sweet* and *hot* are therefore monosemous adjectives, syncretically expressing multimodal concepts. Other expressions that may not be motivated by connections in actual perception would be explained by the fact that many sensory words are also highly evaluative. In *sweet melody*, for instance, the adjective *sweet* does mainly convey a positive value of pleasantness, rather than a taste-related meaning: *sweet melody*, like *sweet smell* and *hot chilli peppers*, is therefore not synaesthetic, nor is it figurative (Lehrer 1978; Shibuya, Nozawa, & Kanamaru 2007; Paradis & Eeg-Olofsson 2013; Winter 2016, 2019a).

Metonymic and non-figurative accounts are both appealing for specific examples, but neither seems convincing for others, for instance for the expression *cold sound*, or for creative sensory images such as Keats' *velvet summer song* and Byron's *eyes have ears* (examples from Ullmann 1945). Here, neither experiential contiguity nor evaluativity seem to be sufficient motivations. Viewing synaesthesia as a metaphor, as in traditional studies but with renewed awareness, seems to allow for a more comprehensive account: we briefly discuss why.

While our sensory experiences are largely multisensory and cross-sensory, we nonetheless tend to classify most of them into rather distinct conceptual categories (which may vary across cultures and languages; see Classen 1993; Levinson & Majid 2014). For example, the noun *smell* is rated in Lynott et al.'s (2019) sensory norms (based on 3,500 participants' judgments) as almost unimodally olfactory (4.9 on a scale of 5), and the adjective *bitter* as gustatory (4.2). This supports the idea that in the expression *bitter smell* there is a transfer, generated by a conflict (in Prandi's (2017) sense) between two sensory domains that are conceptually distinct; the fact that taste and olfaction are highly intertwined senses, and the fact that *bitter* is strongly evaluative, may of course contribute, explaining why *bitter smell* is commonly used and doesn't strike us as being conceptually challenging or creative. Transfer as consequence of conceptual conflict is indeed a defining feature of metaphor, and under this account *bitter smell*, *loud color*, *sweet melody*, *velvet summer song*, and all the examples mentioned above, can equally well be considered (synaesthetic) metaphors, more or less creative ones (on computational models to assess the creativity of synaesthetic metaphors, cf. Chersoni, Strik Lievers, & Huang 2019).

It should also be noted that synaesthesia is not the only figure of speech through which concepts pertaining to different senses may be associated. However, in the other figures either there is no conceptual conflict, or the conflict is canceled once the figure is identified (Strik Lievers 2018; on the interaction of synaesthesia with other figures, cf. also Tornitore 2000; De Salazar 2019). The first case is that of simile. By writing that *music spread like light*, Shelley states that music and light have a similar way of spreading: he does not attribute visual properties to music, as it would have been the case in, for instance, *shiny music*. The second case is that of hypallage and metonymy. In Byron's *The odorous purple of a new-born rose* the conflict between *odorous* and *purple* disappears as soon as it is noted that *odorous* consistently refers to *rose*, by way of hypallage. In *black music* there is no conflict between visual and auditory concepts, once *black* is interpreted as metonymically referring to the people that play the music. The only case in which an actual transfer occurs, induced by conceptual conflict, is that of synaesthesia, which we may thus define as a genuine metaphor of the senses. In its most frequently occurring form, that is, a noun phrase with an adjectival modifier, the adjective typically expresses the source of the transfer and the noun its target, so that, for example, in *loud color* the metaphorical transfer is from the modality of hearing to that of vision.

3. Directionality in Linguistic Synaesthesia

Traditionally addressed by literature scholars or mentioned in psychological research, synaesthesia enters the realm of linguistics thanks to Stephen Ullmann, who dedicated several studies

specifically to this figure from the late 1930s on (the results are summarized in his 1957 *Principles of Semantics*). Ullmann analyzed a large corpus of 19th-century English, French, and Hungarian poetry and noticed that, despite the differences linked to the poetics of the individual authors, cross-sensory transfers in synaesthetic metaphors tend to follow a specific pattern. Assuming a partitioning of the sensorium into six senses (the five classical ones plus temperature) and an Aristotelian hierarchical disposition of the individual senses, Ullmann observes that synaesthetic transfers tend to go from the hierarchically lower modalities (touch/temperature, taste, smell) to the higher ones (hearing, sight) rather than the reverse; in his sample, 83% of transfers follow the low-to-high direction. In other words, hearing and sight are the preferred target modalities, while the other senses rather function as source. Moreover, hearing is the most common target modality (as in *Thou shalt hear sweet music/ And breathe the fragrance/ Of flowers immortal!*, H. W. Longfellow) and touch/temperature the most common source (as in *I lay there till the warm smell grew/ More sharp*, A. Swinburne). Ullmann suggests that this is an instance of what he calls *panchronistic statistical laws*, that is, semantic regularities which deal with "common and recurrent patterns, but will yield no information concerning individual transfers", and which "should enable us, if not actually to *forecast* developments, at least to form a rough idea of probabilities" (Ullmann 1957: 290).

As Ullmann himself acknowledges, the synchronic and diachronic directional pattern he observed for synaesthetic transfers requires "a great deal of empirical research" (1957: 192) in order to be confirmed. To this, we may add that such empirical research should ideally consist in the analysis of: (i) a large amount of data, to corroborate the statistical robustness of the pattern, (ii) data from many different languages, to test the cross-linguistic validity of the statistical law, and (iii) data from a variety of textual genres, to check whether the pattern observed in poetry holds in other text types to a similar extent. In what follows, we will review some of the work that has been conducted on this matter.

3.1 English and Other Indo-European Languages

Several studies are dedicated to the use of synaesthetic metaphors by individual authors, mostly poets, writing in different Indo-European languages and in different times. Among such studies, some also have the aim to verify the validity of Ullmann's "law". For instance, Rosiello (1963) explores the work of the Italian poet Eugenio Montale (1896–1981), and confirms that the majority of transfers (66%) are directional, that is, going from the lower to the higher sensory modalities. Mancaş (1962), on three Romanian authors, also observes that most transfers (84%) are directional (on Romanian synaesthesia, see also De Salazar 2019 and references therein), and similar results are obtained by De Felice (2014) on Latin poetry from the first century BCE.

These studies, confirming the presence of a strong directionality in synaesthesia, are all based on literary texts, and especially on texts by authors that made extensive use of sensory imagery in general, due to their individual poetics or to their relation to explicitly "sensophile" literary movements. If the aim is to quantitatively assess the types of attested cross-sensory transfers, it is indeed reasonable to analyze texts that are likely to make a relatively large use of synaesthetic metaphors. However, what about the use of synaesthesia in non-literary language, where synaesthesia occurs much more rarely? Large corpora composed of texts of different genres are needed, together with a method that helps researchers identify the sparse instances of synaesthesia. Large web corpora are good candidates in this respect because, though not necessarily being balanced in a traditional way, they contain a wide typology of texts, ranging from newspaper articles, novels, technical manuals, to more spontaneous genres such as forums postings and other web-based varieties.

Strik Lievers (2015a) analyzes English and Italian web corpora, using a method which allows the automatic retrieval of instances of synaesthesia (see also Strik Lievers & Huang 2016). First, sets of sensory lexemes for each word class (nouns, adjectives, verbs) and for each sensory modality (the traditional five senses) are built using lexical resources and then manually checked. These lexical

sets allow the automatic retrieval of all sentences potentially containing synaesthesia, that is, all sentences containing two lexemes which belong to two different sensory modalities and which are in a dependency relation to one another. Finally, all automatically extracted sentences have to be carefully checked to remove those containing associations of sensory lexemes that turn out not to be true instances of synaesthesia (e.g., *black music*, which is usually a metonymy, where *black* does not refer to a color but to a human being). Synaesthetic metaphors identified with this method confirm, for both English and Italian, a predominance of directional transfers as strong as that observed in Ullmann (1957) and subsequent work on poetry. Similar results for Italian are also obtained by Ronga et al. (2012) analyzing noun-adjective cross-sensory pairings in a web corpus. The general low-to-high pattern therefore seems to be confirmed, though it must be highlighted that individual counterdirectional transfers may of course occur, as stated by Ullmann himself, and that within the lower modalities much more variety is found across studies.

It may be interesting to report that very different patterns of association are found by Zawisławska et al. (2018) in the corpus of Polish synaesthetic metaphors (Synamet) that they built through a manual annotation of blog texts: here, smell and taste appear as the main target of transfers. This is, however, due to the specific composition of the corpus, which mostly features perfume- and food-related blogs, that is, texts dealing with smell and taste perception respectively. For the same reason, smell is the target of most instances of synaesthesia in Patrick Süskind's novel *Perfume*, whose main character has the peculiarity of only experiencing the world around him through the sense of smell (see Strik Lievers 2015a, 2016).

Finally, it is worth mentioning that, unsurprisingly, most counterdirectional transfers in Strik Lievers (2015a) turned out to be coming from literary texts which were also part of the web corpus. This highlights the creative power of linguistic structures and relations, which may in principle connect any sense with any other sense, and more generally evidences the fact that "it is the very law of poetic expression to exceed thought" (Gaston Bachelard, quoted in Bruhn 2011: 620).

3.2 Chinese and Other Non-Indo-European Languages

Earlier studies on directionality of linguistic synaesthesia largely focused on Indo-European languages, though we may for instance mention Dombi (1970) on Hungarian, and Shen (1997 and following work) on Hebrew, both confirming the general low-to-high pattern, with minor internal variation (e.g., in Dombi's data the favored target is vision, instead of hearing). Only a few studies on Asian languages were reported, including Sinitic languages (Lien 1994; Yu 2003), Indonesian (Shen & Gil 2008), and Japanese (Shinohara & Nakayama 2011). More extensive research emerged only after Strik Lievers's (2015a) introduction of corpus-based approached to linguistic synaesthesia. Many of these more recent studies focused on the directionality of synaesthesia, aiming to test the validity of this pattern against more extensive data.

Overall, the low-to-high synaesthetic mapping directionality tendencies are attested, yet with language-specific preferences for specific cross-sensory associations. Take the domain of taste as an example. Synaesthetic transfers with taste as a source domain are most likely to be vision-bound in Chinese (Zhao, Huang, & Long 2018), audition-bound in Korean (Jo 2019), and smell-bound in Japanese (Shinohara & Nakayama 2011). As concerns synaesthetic transfers within the lower modalities, a variety of combinations is found, often showing a bidirectional pattern (cf. Zhao, Huang, & Ahrens 2019, distinguishing between unidirectional, biased-directional, and bidirectional transfers). For instance, in a series of studies where the additional "low" sense of pain is considered, it is shown that both pain-to-taste (low-to-high) and taste-to-pain (high-to-low) transfers are attested in Chinese, as exemplified by 涩味 *sè-wèi* 'coarse-taste; astringent taste', 脚站酸了 *jiǎo-zhàn-suānle* 'feet-stand-sour; the feet feel achy due to standing', respectively (Zhao, Huang, & Long 2018; Zhao, Huang, & Xiong 2019; cf. also 苦痛 *kǔ-tòng* 'bitter-pain; bitter pain; mental suffering';

Xiong & Huang 2016). Moreover, taste features as a particularly prominent source modality in both Korean and Chinese; Xiong and Huang (2016) for instance examine taste-related expressions in Buddhist texts and find that 味 *wèi* 'taste' serves as an umbrella term to refer to all kinds of sensory feelings, exhibiting rich synaesthetic mappings to all the other senses.

More unexpectedly, bidirectional transfers are also observed between the low and high senses. As concerns the senses of touch and vision, this may be illustrated by 冷色 *lěng-sè* 'cold color', 暖色 *nuǎn-sè* 'warm color' (touch-to-vision; low-to-high), and 清凉 *qīng-liáng* 'clear-cool; refreshingly cool', 清寒 *qīng-hán* 'clear-cold; cold weather; bare poverty' (vision-to-touch; high-to-low) (Huang & Xiong 2019). Similarly, smell and vision can be mapped in both directions in Korean, as shown by *hyangkilo-wun sisen-ul ponay-ta* 'fragrant gaze send; (someone) sends a fragrant gaze' (smell-to-vision; low-to-high) and *tachaylo-wun hyangki sok-eyse* 'colorful fragrance inside at; amidst colorful fragrance' (vision-to-smell; high-to-low) (Jo 2019). In addition, Zhao (2020) and Zhao et al. (2018), based on extensive data from the 10-million-word Sinica Corpus, show that vision also functions as an important source domain in Chinese, together with touch and taste. For instance, 清 *qīng* 'clean' is a highly versatile source for synaesthesia, as in the already mentioned 清凉 *qīng-liáng* 'clear-cool; refreshingly cool' (vision-to-touch).

Finally, Chen et al.'s (2019) experimental paper also reports relevant results on Chinese. This study, aimed at collecting sensory modality norms for this language (as Lynott et al. 2019 did for English), shows that when participants had to rate the dominant modality of words composed by two characters/morphemes referring to two different modalities, in the majority of cases the chosen dominant modality was vision (even in cases in which neither of the components was sight-related, e.g., 冷酷 *lěng-kù*, lit. 'cold-of intense taste, of wine', which was rated to be a predominantly visual word). In this study as well, a few counterdirectional associations were also found.

We may therefore say that the preference for the low-to-high directionality is generally confirmed in terms of frequency, but the results of extensive corpus-based and experimental studies brought a more nuanced and more comprehensive understanding, as foreshadowed by Ullmann's (1957) call for more empirical studies.

3.3 Discussion

Overall, data from several languages, and of different textual types, seem to confirm the strong preference observed by Ullmann for lower-to-higher transfers in synaesthetic metaphors. Further support also comes from a few diachronic studies that have been conducted on the topic. For instance, Williams (1976: 464–465), focusing on adjectives, shows that "[s]sensory words in English have systematically transferred from the physiologically least differentiating, most evolutionary primitive sensory modalities to the most differentiating, most advanced, but not vice versa"; *dulcet*, for example, is etymologically related to taste (cf. Latin *dulcis* 'sweet'), but is now mostly used for sound, as in *dulcet tones*. Strik Lievers and De Felice (2019) show that, in the transition from Latin to Italian, if new meanings of sensory adjectives arise over time, such new meanings are always in a hierarchically higher modality, which seems to support for these languages the predictive value of Ullmann's law; Latin *calidus*, for instance, only has a sensory meaning of temperature ('hot'), while its Italian descendant *caldo* may also be used to describe auditory and visual experiences (*voce calda* 'warm voice', *colori caldi* 'warm colors'). It must however be highlighted that, like the synchronic directional tendency, the diachronic one also should be taken as a "statistical law", which doesn't rule out individual counterdirectional transfers. For instance, in Chinese the basic sensory verb 闻 *wén* 'to smell' was etymologically 'to hear', as attested by its ear radical 耳 (Huang & Xiong 2019; Zhao, Huang, & Ahrens 2019). This hearing to smell transfer is in fact attested in several Sinitic languages (Wang & Akitani 2014).

Finally, another strand of research has experimentally shown that, in several languages, directional synaesthetic expressions such as *sweet melody* are judged by speakers to be more natural, as well as easier to understand and to memorize, compared to counterdirectional ones such as *melodious sweetness* (Shen 1997; Shen & Cohen 1998; Shen & Aisenman 2008; Shen & Gil 2008). These results may be seen as additional evidence for our preference for directional transfers, though they are likely to also reflect the frequency effect of directional transfers being more common in the linguistic input (see also Winter 2019a: 114, fn. 5).

In sum, both in language use (as evidenced by corpus-based studies) and in language reception (as evidenced by experimental studies), the same pattern arises: an overall strong preference for directional instances of synaesthesia, with some minor variation. Are there underlying cognitive and perceptual motivations for such preference, or is it a matter of language? This question is addressed in the following section.

4. Sensory Modalities and Sensory Lexicon

Synaesthesia being the "metaphor of the senses" (Engstrom 1946; O'Malley 1957), perceptual facts are often invoked to account for its properties, and most specifically for the directional tendency discussed in the previous sections. While a direct connection between linguistic and neurocognitive synaesthesia is to be excluded (Tsur 2007; Strik Lievers 2015b; Zhao et al. 2018; Winter 2019a: ch. 6), many scholars suggest explanations based on the functioning of human sensory perception and/or its cultural organization. The main idea is that preferences in sensory combinations observed for synaesthetic metaphors reflect a hierarchical disposition of the individual senses, which has vision at its top, followed by hearing and then the other senses.

Vision is considered to be dominant in human perception (Stokes & Biggs 2014), as is also confirmed by tasks showing that vision is the sense on which we rely the most when we receive conflicting information coming from other senses (e.g., McGurk & MacDonald 1976). According to Yeshayahu Shen and colleagues, these asymmetries in perception are, moreover, mirrored by asymmetries in cognition, in that concepts from the hierarchically lower senses would be more accessible, and preferences in synaesthetic transfers' combinations are interpreted as obeying a "cognitive constraint" of directionality based on which "a mapping from more 'accessible' concepts onto 'less accessible' ones seems more 'natural', and is preferred over the opposite mapping" (Shen 1997: 54). Related to this are the accounts seeing different degrees of embodiment across the senses as predicting the likelihood of transfers, with the lower, arguably more embodied senses as more likely to be sources (see Zhao et al. 2018).

Vision also appears at the top of the cultural hierarchy of the senses that we have inherited from Aristotle and which, although not undisputed across the centuries, still holds in our times, and which seems to have at least visual dominance in common with the perceptual hierarchy (see Reilly, Flurie, & Peelle 2020, arguing for an even closer parallelism between the perceptual and the cultural hierarchy, based on the comparison of a database gathering functional brain activation data and a database of sensory norms for English sensory lexemes).

Visual dominance is indeed likely to explain why vision is much more frequently a target than a source of synaesthetic transfers: given its perceptual and cultural centrality in our lives we talk more often of visual experience than of experience from other senses (San Roque et al. 2015; Strik Lievers 2015a). Not all combination preferences are however easy to justify through this sensory hierarchy. For instance, why is it that in many languages it is not sight, the "highest" sense, that is the ultimate target of synaesthetic transfers, but hearing (mostly with sight as the source)? Why is touch the most frequent source, although smell is likely as low or even lower in the Western cultural sensory hierarchy? And why is some cross-linguistic variation attested, as in the case of the frequent use of sight (also) as a source modality, reported for Chinese? As far as the cultural hierarchy is concerned, moreover, there is great variation across cultures: not only the internal partitioning of

the sensorium varies, but also the relative importance attributed to the individual senses (Classen 1993; see also Xiong & Huang 2018 on the sensorium in Buddhist philosophy).

Since synaesthetic metaphors are expressed through language, another path worth exploring consists in taking into account linguistic properties, and more specifically the composition of the sensory lexicon. First, sensory modalities differ in their degree of linguistic encodability, both within a single language and across languages/cultures. Second, sensory modalities differ in the kinds of lexemes that are preferentially used to describe them.

As for the degree of encodability, in most languages vision and hearing have dedicated lexemes and can rely on a richer vocabulary compared to the other modalities (Buck 1949; Viberg 1983), while for the latter more variability is observed across languages/cultures. In English and other Indo-European languages, smell is known to be the lexically "poorest" sense: this might contribute to explaining why in these languages smell is a less frequent source than the lexically richer sense of touch, which can count on more lexemes to be "borrowed". Other languages, however, have a rich and differentiated olfactory lexicon, which reflects the greater relevance of the sense of smell in the society and culture where these languages are spoken (e.g., Majid & Burenhult 2014). It may be interesting to explore whether this cultural and lexical difference is associated to different preferences in synaesthetic transfers, but data from these languages are so far not available on this issue.

Concerning the kinds of lexemes available for the senses, Strik Lievers and Winter (2018) show that lexical categories are distributed unevenly across modalities in the English sensory lexicon, so that, among other things, adjectives are under-represented for sound, while they are over-represented for sight. Given that in most cases synaesthetic metaphors are formed by an adjective/source and a noun/target, it is not surprising that when sight and sound are combined, sight is more commonly a source than a target (as in *bright voice*); moreover, as convincingly argued by Winter (2019a: ch. 9), the high iconicity of many auditory (vs. visual) words might prevent their use as metaphoric sources. Research on the distribution of lexical categories within the sensory lexicon has also been conducted for Chinese by Zhong (2020), showing for instance that not only touch and taste are particularly rich in adjectives, but also sight, which may possibly explain its cross-linguistically unusually strong disposition to serve as a source of synaesthetic transfers. More research on the composition of the sensory lexicon of other languages may show whether similar correlations also hold for languages other than English and Chinese.

As appears from this brief overview, the strong preferences in synaesthetic sensory associations cannot be fully explained by a single motivation, but rather by a combination of perceptual, cultural, and linguistic factors (Strik Lievers 2015a; Winter 2019a), which are moreover often highly intertwined (e.g., the fact that sigh has a rich vocabulary is likely linked to visual dominance in perception). Not only is the explanation multifactorial but, given the relevance of cultural and linguistic motivations, it may in part be different for different languages. Further research on this aspect, and gathering of data on other languages, is therefore desirable.

5. Conclusion

In this chapter we overviewed studies of linguistic synaesthesia as a window to the interaction among sensory domains as well as among cognition, language, and the senses. A focus on the sensory lexicon allowed us to better understand the mechanisms behind synaesthesia and also enabled new research to use linguistic synaesthesia to explore fundamental issues such as the cognitive basis of grammatical categories. The most salient issues we explicated are the following:

- **What is linguistic synaesthesia?** We presented different opinions on the topic and argued that it is a type of metaphor by which concepts pertaining to two different sensory modalities are combined, generating a conceptual conflict.

- **Is there a directional pattern in linguistic synaesthesia, and if so, what is its nature?** Ullmann (1957) proposed that there is a strong tendency for synaesthetic transfers to follow a specific pattern, going from the so-called lower to the higher senses. We reviewed studies dealing with this issue in (1) literary and non-literary language, (2) synchrony and diachrony, and (3) different languages. It emerged that the low-to-high directionality is overall strongly confirmed, though across languages there is some variation as concerns the directionality of specific cross-sensory combinations.
- **Which theoretical model is best suited to account for the directional pattern in linguistic synaesthesia?** We reviewed explanations (perceptual/cultural/linguistic) that have been proposed in the literature, and argued that it is only a combination of such explanations that can account for both the general shared pattern and language-specific differences.
- **What is the cognitive basis of linguistic systems?** Recent studies on the sensory lexicon, and on modality exclusivity norms based on the sensory lexicon, offer a new approach to explore the cognitive basis of language, and linguistic synaesthesia emerges as one of the most crucial sets of data for such studies.

Note

1 Francesca Strik Lievers drafted sections 2, 3, 3.1, 3.3, and 4, Chu-Ren Huang drafted sections 1 and 5, and Jiajuan Xiong drafted section 3.2. All the three authors contributed to the discussion and revision of the final version.

Further Reading

In addition to the research cited and discussed in the chapter, the following are recommended for readers who are interested in exploring more specific areas.

Winter's (2019a) *Sensory linguistics* offers an updated and comprehensive coverage of emergent issues related to the senses in cognitive linguistics.

Cytowic's (1998) *The man who tasted shapes* is a good read and an accessible book for those who are interested in neurocognitive synaesthesia without having a biomedical background.

Strik Lievers & Huang (2016) introduces corpus-based methodologies for the identification of synaesthesia, providing a link to possible studies and applications in natural language processing.

Strik Lievers & Winter (2018) explores the composition of the English sensory lexicon, focusing on the relation between the properties of lexical categories and the phenomenological properties of the senses in actual perception.

Huang & Xiong (2019) offers a comprehensive overview of research on synaesthesia in the Chinese language.

Enjoy reading your next book in literature for discoveries such as *a rose called by any other name would smell as sweet*!

Related Topics

embodiment; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; cognitive neuroscience of language

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CULTURE IN LANGUAGE AND COGNITION

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1. Introduction

1.1 Independence versus Interdependence of Language, Mind and Culture

Cognitive Linguistics (CL) was forged in the matrix of cognitive sciences as a distinctive and highly interdisciplinary approach in linguistics. Foundational texts such as Lakoff (1987), Langacker (1987), and Talmy (2000) drew upon long but often neglected traditions in cognitive psychology, especially Gestalt psychology (Sinha 2007). A fundamental tenet of CL is that the cognitive capacities and processes that speakers and hearers employ in using language are *domain-general*: they underpin not only language, but also other areas of cognition and perception. This is in contrast with Generative (or Formal) Linguistics, to which CL historically was a critical reaction, which takes a *modular* view of both the human language faculty and its subsystems. For Generative Linguists, not only is the subsystem of syntax autonomous from semantics and phonology, but language as a system is autonomous both from other cognitive processes, and from any influence by the culture and social organization of the language community. There is one significant exception to this, which is that all linguists will agree that the *lexicon* of a language is affected by culture (including both names for natural kinds and names for artifacts and institutions). However, Generative Linguists maintain that the *grammatical* features of languages are entirely independent of cultural patterns. In cognitive and construction grammars, the distinction between lexicon and grammar is less categorical than in formal linguistics (Langacker 1987; Kay & Fillmore 1999). If language affords a window into the mind, and if there are differences in individual minds as a result of differences in the cultures that form these minds, then language (at all levels of analysis) will also provide a window into culturally specific cognition. This is the promise of a *cultural linguistics* based upon CL. Furthermore, since Cognitive Linguists believe that all the linguistic facts of a language, including grammatical facts, are motivated by *meaning*, and culture is fundamentally about meaning and variations between human groups in their organization of meaning (Sinha 2017a), then a cultural linguistics will be based on the assumption that language, culture, and mind are mutually *interdependent*, rather than *independent* (Sinha 2017b).

1.2 What Is Culture?

What the word 'culture' means has been the subject of much debate and disagreement. A much-cited early definition is that of the 19th-century British anthropologist E. B. Tylor: "that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society".[1] This definition has frequently been criticized, however, as being both too vague, and neglectful of the importance of the fact that cultures are *different* from one another. By the mid-20th century anthropologists Kroeber and Kluckhohn (1952) were able to cite no less than 164 definitions of culture, settling themselves on the following:

> Culture consists of patterns, explicit and implicit, of and for behaviour acquired and transmitted by symbols, constituting the distinctive achievements of human groups, including their embodiments in artefacts … culture systems may, on the one hand, be considered as products of action, and on the other as conditioning elements of further action.

This definition stresses the importance of symbols, artifacts, and action, but (in keeping with the behaviorist tenor of the time when it was written) neglects the importance of the cognitive foundations that support these.

Sinha (2017b: 9) places meaning at the center of the definition of culture, proposing that any human culture should be thought of as "a pattern or patterns of meaning … a normative order, realized and reproduced in semiotic systems or vehicles including language, and in enduring artefacts and institutions; and enacted and renewed in social and communicative practices". Sinha (ibid.) also emphasizes that culture can be conceptualized from three equally valid perspectives: *Ways of doing things* (practices); *Ways of thinking and feeling* (mental models, schemas, worldviews, ideologies, structures of feeling); and *Ways of talking* (discourses). All of these perspectives have been influential in the history of thought about language and culture in different disciplines.

2. Historical Perspectives

2.1 Anthropological Perspectives

The discipline that is historically, and to this day remains, most centrally concerned with culture is anthropology. In a way, the history of the discipline of anthropology is the history of its changing conceptualizations of culture. Throughout the 19th century, the predominant perspective was a cultural-evolutionary one, in which different human groups were thought of as existing on a universal scale of complexity and sophistication. In the influential theory of Lewis Henry Morgan (1877), society and culture progress from savagery through barbarism to civilization. This evolutionism underpinned a Eurocentric, implicitly (and in its Social Darwinist variants, explicitly) racist *phylocultural complex* (Sinha 1988), which included the assumption that "primitive languages" lacked the complexity and clarity of the languages of "civilized" peoples.

This prejudiced and scientifically ill-informed view was challenged and overthrown by the American anthropologist Franz Boas, one of the founding fathers—along with Bronislaw Malinowski, who coined the term "ethnolinguistics" (Senft 2007)—of linguistic anthropology, and the principal forerunner of contemporary cultural linguistics.[2] Anthropology's serious engagement with the relationship between cultures and languages began with Boas's field studies of Native American languages, culminating in the publication in 1911 of the *Handbook of American Indian Languages*.[3] In the Introduction to this epochal work Boas explicitly acknowledged the mutual interrelationships between language, mind, and culture. "The purely linguistic inquiry", he wrote, "is part and parcel of a thorough investigation of the psychology of the peoples of the world" (Boas 1911: 63). Boas believed in the 'psychic unity of mankind' (Köpping 1983), that is, that all human beings possess the same fundamental psychological capacities and that there exist "uniform laws

governing the human mind" (Boas 1896: 901). He also held that "the occurrence of the most fundamental grammatical concepts in all languages must be considered as proof of the unity of fundamental psychological processes" (Boas 1911: 71).

Boas recognized that cultures transmit learned and distinctive ways of thinking, and that this transmission occurs *via* language, while arguing against the idea that either language or culture sets a limit on the potential for either individuals or societies to acquire new modes of thought. For example, he noted (correctly) that "many languages exist in which the numerals do not exceed two or three", a fact that he attributed to the social practices of the group: "counting does not become necessary until objects are considered in such generalized form that their individualities are entirely lost sight of". However, "there is no proof that the lack of the use of numerals is in any way connected with the inability to form the concepts of higher numbers" (Boas 1911: 66). The general position arrived at by Boas was that "the form of the language will be moulded by the state of culture, but not in so far as a certain state of culture is conditioned by morphological traits of the language" (Boas 1911: 67).

Boas (1896) was the first anthropologist to advocate (against the evolutionism of Tylor and Morgan) the theoretical and methodological stance that would later be called *cultural relativism*: the proposition that the ideas, values, and practices of each culture should be understood in terms of the complex whole of the culture, rather than in terms of some presumed universal evolutionary scale.[4] This relativistic stance informs the methodological distinction, common to ethnographic approaches in both linguistics (Pike 1975) and psychology (Berry 1969) as well as anthropology, between *emic* (study of cultural and linguistic forms in an internalist framework) and *etic* (study of cultural and linguistic forms from an external, comparativist perspective) approaches. Because of Boas's passionate determination to record and document the endangered, often dying, languages of Native North American cultures, his and his students' work also anticipated and laid the ground for contemporary approaches to the documentation of endangered languages. It is important to note that for Boas the description and analysis of endangered languages was not a sub-discipline of linguistics. Language description was intrinsically inseparable from ethnographic studies. Indeed, Boas was the originator of the "four field approach", still key to anthropology in the United States, according to which the discipline consists of the subfields of archaeology, linguistics, physical anthropology, and cultural anthropology. Several scholars have recently criticized mainstream approaches in present-day documentary linguistics as having neglected (in their pursuit of methodological rigour and uniformity) this all-important interdisciplinary and social scientific matrix (Austin 2016; Grinevald & Sinha 2016).

Because of an increasing gulf between linguistic and anthropological theories, the Boasian tradition came to be associated in the second part of the 20th century with a predominantly grammatically oriented descriptive linguistics. Anthropological linguistics no longer shared theoretical foundations with the newly emerging currents in the microsociology of communication (Goffman 1967), conversation analysis (Sacks et al. 1974), and symbolic and critical anthropology (Geertz 1973; Clifford & Marcus 1986). A new approach to anthropology of language, *ethnography of communication* (Gumperz & Hymes 1972), gained ground, whose practitioners "[broke] with the Boasian tradition of conceiving culture as a mental phenomenon, tending to neglect issues of 'knowledge' in favor of 'performance'" (Duranti 2003: 328). It is this approach that, especially in the United States, came to be identified with the term 'linguistic anthropology'. However, the resurgence of research in linguistic relativity (see below) in the late 20th century has brought renewed interest amongst anthropologists in the Boasian tradition; as well as its reincarnation (amongst linguists) in the "new" field of cultural linguistics.

2.2 Psychological Perspectives

A cornerstone of the 19th-century phylocultural complex was the view that the non-European "savage mind" was less developed and more "child-like" than that of white Westerners. As Tylor

(1865: 125) put it: "Between our clearness of separation of what is in the mind from what is out of it, and the mental confusion of the lowest savage of our own day, there is a vast interval." This notion of 'mental confusion' was later transformed by anthropologist and sociologist Lévy-Bruhl (1910) into a theory of 'pre-logical primitive thought', a terminology he later rejected because of its overt Eurocentrism, and in light of his acceptance that "the fundamental structure of the human mind is the same everywhere" (Lévy-Bruhl 1949, cited by Pertierra 1983: 114). Lévy-Bruhl's fundamental proposition, in his later work, was that although individual mental capacities are universal (psychic unity), the *mode of thinking* of pre-modern societies is different from that of modern societies (relativity). In a way, Lévy-Bruhl's theory can thus be said to occupy a halfway house between the imperial and racial fantasies of the phylocultural complex, and 20th-century cultural and linguistic relativism.

The work of Lévy-Bruhl had a major impact on early 20th-century psychology, especially the two pre-eminent theorists of mind and language, Jean Piaget and Lev Vygotsky, both of whom drew parallels between the thought of children and the thought of non-Western cultures. As Peterman (2000: 405) puts it: "Lévy-Bruhl studied sociogenesis in the contrast between primitive and modern mentalities; Piaget studied psychogenesis in an analogous contrast between child and adult mentalities." In their later work, Piaget and Vygotsky both disavowed this parallelism, but they remained influenced by Lévy-Bruhl's ideas, even while their theories of the relationship between cognitive development and child language development significantly diverged.[5]

Piaget accorded priority to the development of cognition through coordinations of action resulting in increasingly complex operational schemas, and he viewed language development as being governed by the development of non-linguistic cognition. Vygotsky, in contrast, argued that language and other signs played a crucial role in the child's development to formal reasoning. Piaget was a universalist: he claimed that all children progressed through the same developmental stages, only the rate of development being influenced by social and cultural factors. For Vygotsky, by contrast, "higher psychological functions" (including memory and reasoning) are shaped by the cultural forms that they take in any given society, and are *semiotically mediated*—that is, it is the acquisition and use of linguistic and other signs that enables the development of the psychological function. As Vygotsky wrote: "The internalization of cultural forms of behavior involves the reconstruction of psychological activity on the basis of sign operations … The internalization of socially rooted and historically developed activities is the distinguishing feature of human psychology" (Vygotsky 1978: 57–58).

Since he held that human cognition is embodied not only in the brain, but also in the products of material and symbolic culture (in tools, artifacts, and signs, including the signs of language), Vygotsky and his colleagues sought to investigate cultural differences in both human development and adult cognition. To this end, they conducted in the early 1930s a series of studies of changes in higher cognitive processes concomitant with the social transformations wrought by the collectivization of agriculture in Uzbekistan (Luria 1976). This study was an early example of cross-cultural psychology, and set the scene for later research such as that of Michael Cole and colleagues (Cole, Gay, Glick, & Sharp 1971), employing a methodology that they dubbed 'experimental anthropology' to investigate the influence of schooling on modes of thought in Liberia.

Cole and his colleagues' research helped to change the terminology of the 'culture and thought' nexus. Moving beyond the idea of a uniform distinction between more and less 'advanced' societies, and between 'logical' and 'non-logical' thinking, they focused instead on the ways in which transcultural cognitive resources are brought to bear on different problem areas, in different contexts of reasoning and communication. Their "major conclusion" was that "*cultural differences in cognition reside more in the situations to which particular cognitive processes are applied than in the existence of a process in one cultural group and its absence in another*" (Cole et al. 1971: 233, authors' italics).

In the late 20th century, studies of culture and mind underwent a further paradigm shift, from cross-cultural psychology (which conceptualized its object as 'culture *and* psychology'), to an

interdisciplinary *cultural psychology*, with a focus on "the systemic and dynamic nature of culture in psychology, and psychology in culture … Culture is not an 'independent' variable, but a label that denotes the systemic organization of the semiotic and historical nature of human psychological processes" (Valsiner 1995: 7). This Vygotskian-inspired theoretical approach includes cultural comparisons, and interfaces with ethnographic studies of socially and communicatively situated cognition and learning (Lave & Wenger 1991), as well as with radical enactivist accounts of the 'cultural permeation' of mind (Hutto et al. 2020).

2.3 Linguistic Relativity

The theory of linguistic relativity has its roots in European philosophy and cultural theory, especially the foundational research of polymath and educator Wilhelm von Humboldt (1999 [1836]), who wrote that "the diversity of languages is not a diversity of signs and sounds but a diversity of worldviews" (cited in Trabant 2000: 25). The more recent (and most often misunderstood and misrepresented) version is often referred to after its originators, Edward Sapir and Benjamin Lee Whorf, and had its origins in Boasian anthropological linguistics (Darnell 2006). Sapir was a student of Boas, and Whorf was a student of Sapir. Although Sapir and Whorf borrowed both terminology and intellectual inspiration from Einstein's theory of relativity, the theory developed directly out of Boasian relativism, as expressed by Sapir (1949: 153–155): "The outstanding fact about any language is its formal completeness"; that is, there are no "primitive languages" that are restricted in expressive power on some hypothetical evolutionary scale, any more than the cultures of the world can be ranked on their primitivism vs. civilization. Boas tended, as we have seen, to emphasize 'psychic unity', while recognizing that languages can be expressive of cultural patterns. Sapir and Whorf took the Boasian approach one step further, or perhaps better said, placed a greater emphasis on the *interdependency* of language, culture, and thought, a notion that had remained implicit rather than explicit in Boas's work. In the Sapir-Whorf theory, language *both expresses* cultural patterns and worldview, *and influences* habitual ways of thinking in individual members of the speech community: "We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation" (Sapir 1949: 69). Such 'predisposition', it should be noted, does not (as Boas had already emphatically pointed out) imply a limitation of thought by language.

However, the notion of a dynamic, triadic relationship in which "language, thought, and culture are deeply interlocked" (Gumperz & Levinson 1996: 2) was subsequently reduced and simplified (largely by experimental researchers) to just such a dyadic and unidirectional "linguistic determinism"—the determination of individual thought by language (Jourdan & Tuite 2006; Leavitt 2010). As Sinha and Jensen de López (2000: 27) put it: "reference to culture in views ranging from Humboldt, through Boas, to Sapir and Whorf, which refer to language and 'world view', [was] downplayed in the narrowing of the problem-field to one of individual psycholinguistic functioning". This reduction not only distorted the representation of linguistic relativity theory in scientific and popular discourses, it also exaggerated the distinction between Whorf's alleged linguistic determinism and Boas's acceptance of psychic unity (Lee 1996). Linguistic determinism (and psychological relativism) is often attributed to Whorf on the basis of the following quotation (2012: 213–221):

> We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way, an agreement that holds throughout our speech community and is codified in the patterns of our language … Users of markedly different grammars are pointed by their grammars toward different types of observations and hence different evaluations of externally similar acts of observation,

> and hence are not equivalent as observers but must arrive at somewhat different views of the world.

In fact, however, Whorf was by no means an unconstrained relativist with respect to psychology, believing (in anticipation of CL theories) that "Gestalt psychology gives us a canon of reference for all observers, irrespective of their languages" (Whorf 2012: 163). During the 1950s, however, it was the linguistic determinist version of the "Whorf hypothesis", further simplified by the assumption that the hypothesis applied mainly or exclusively to the lexicon, that began to be tested by experimental psycholinguists in relation to the domain of *color* (see below). This research was influential, in the wake of the 'first cognitive revolution', in leading to a consensus that Whorf was fundamentally wrong, a view that went largely unchallenged until the 1990s.

A milestone in the re-evaluation of the theory of linguistic relativity was the publication of John Lucy's two volumes of historical-theoretical and empirical studies (Lucy 1992a, 1992b) in which he argued (consistently with Whorf's own writings) for the primacy of grammatical over lexical linguistic diversity in the empirical investigation of the effects of linguistic categorization on non-linguistic cognition. Although Lucy acknowledged the situatedness of language (especially language use) in culture, he argued for a methodological dissociation between language and culture in field research: "a true 'linguistic' relativity, insofar as it is an autonomous force, must, by definition, operate somewhat independently of a more general cultural relativity" (Lucy 1992a: 269).

Lucy's theoretical reconstruction of linguistic relativity, and his field-based comparative experimental methodology (which bears many resemblances to Cole's 'experimental anthropology', see above), were influential in the large-scale cross-linguistic studies of *spatial frames of reference* (see below) in language and cognition carried out at the Max-Planck Institute for Psycholinguistics under the leadership of Stephen Levinson (1996, 2003). The general theory of the method that inspired this work, and much subsequent "neo-Whorfian" research, requires the identification of linguistic typological parameters in order to investigate their correlation with, and putative causation of, cross-linguistic cognitive-behavioral differences, independently of other dimensions of cultural variation. The treatment of language variation and cultural variation as "independent variables", and the methodological individualism inherent in behavioral experimentation, conflict with the methodological stance of 21st-century cultural psychology (see above), that attempts to explore "culture in mind and mind in culture". However, if neo-Whorfian research can be criticized for its over-emphasis on the relative autonomy of typological features of language from culture and social organization, cultural psychological research can also be criticized for paying insufficient attention to language-specific (including typological) aspects of the semiotic mediation of thought.

2.4 Semiotic Mediation and Extended Embodiment

Cognitive Linguistics takes as its starting point the idea that language affords us a *window into the mind*. Since language is based upon and exemplifies general properties and processes of human cognition, such as Figure-Ground organization, prototypicality in categorization, and so on, the study of language is simultaneously the study of cognition: language is an *expression* of human cognitive processes, and *cognition makes language possible*. The notion of semiotic mediation rests upon a different intuition, which is that the "higher cognitive processes" (often held to be uniquely human)[6] *depend upon* language and, more generally, upon the human use of signs (Mertz & Parmentier 1985). This idea, with roots in Leibniz's philosophy (Leavitt 2010: 60, 73), had as its most celebrated early advocate the French Enlightenment philosopher Condillac, who wrote:

> the mental operations of animals are limited to perception, consciousness, attention, reminiscence and imagination not under their control … If contemplation consists in preserving

> perceptions, then before the use of institutional signs, it is merely outside our control … as long as imagination and contemplation operate outside our control, we cannot direct our attention as we please … But when someone begins attaching ideas to signs of his own choosing, we see his memory begin to form … Later, he acquires much greater control over his imagination as he invents more signs, for he has many more ways of using it.
>
> Condillac 1987 [1746]: 459

This was the seed of the concept of semiotic mediation conceived as a *developmental process*, which Vygotsky considered to be *constitutive* of uniquely human higher cognitive processes. From this perspective, *language makes higher cognition possible.*

Three important points need to be made here. First, the idea of language as a window into cognition and the idea of semiotic mediation, though apparently opposed, do not necessarily contradict each other: they can be viewed as complementary insights into the dynamic interdependency characterizing the language-thought relationship. Second, if cultures are viewed as "webs of significance" (Geertz 1973: 5), or meaning-bearing systems, then it is through semiotic mediation that culture permeates mind, as insisted by cultural psychology. Further, if these meaning-bearing systems (including language) vary between cultures, it is through semiotic mediation that *cultural difference* in minds is established and maintained. Third, semiotic mediation includes (but is not restricted to) the mediation of thought by language. It also includes mediation by other communicative signs such as gestures and icons, but also by *material artifacts* (Vygotsky used as an example the tying by a mother of a knot in her child's handkerchief to remind the child to give a message to the schoolteacher). Objects, therefore, also have meanings and can function as signs (Sinha 1988, 2015).

From this perspective, culture can be viewed as an *extension of embodiment into the world of humanly created meaning.* This insight may first have been expressed by philosopher Maurice Merleau-Ponty (1962: 146):

> The body is our general medium for having a world … Sometimes the meaning aimed at cannot be achieved by the body's natural means; it must then build itself an instrument, and it projects thereby around itself a cultural world.

Yu (2014: 233) reminds us, in the same vein, that

> the body does not terminate with the fleshy boundary of the skin, but rather extends out into its environment that is at once physical, social, and cultural, engaging in all sort of bodily and sociocultural interactions, so that the organism and environment are not independent, but rather interdependent aspects of the basic flow of bodily experience … to fully understand the body, we will have to go beyond the body itself.

The perspective of *extended embodiment* has been central to the recent shift from "neo-Whorfian" to "post-Whorfian" research paradigms (Sinha & Bernárdez 2015).

2.5 Cultural Linguistics

Cultural linguistics is a relatively new term for a field with a long history, from von Humboldt to its designation by Palmer (1996: 36) as a synthesis "concerned with most of the same domains of language and culture that interest Boasians, ethnosemanticists and [ethnography of communication], [that] assumes a perspective … that is essentially cognitive". Sharifian (2017: 2) also foregrounds the affiliative link between the concerns of CL and cultural linguistics, which "engages with

features of human languages that encode or instantiate culturally constructed conceptualizations encompassing the whole range of human experience". Sharifian (2017: 23) further proposes that "cultural schemas, cultural categories and cultural metaphors are the three main analytical tools of cultural linguistics", emphasizing theoretical concepts that interface directly with the concerns of both cultural psychology and psychological anthropology (Shore 1996). In the present author's view, what is important is not so much the axiomatic delimitation of the scope of cultural linguistics, as the recognition of the way in which advances in cognitive linguistics have lent a renewed impetus to the interdisciplinary study of language, culture, and mind.

3. Methods

Researching language, cognition, and culture depends on combining and comparing empirical findings obtained by using different methods, developed in different disciplinary contexts. The field of study is both *interdisciplinary* and *multi-methodological.* Mixing methodologies, and especially taking advantage of modern technologies for data recording and analysis, brings huge advantages, but also poses challenges because of the divergent assumptions underlying different methods. We start by briefly examining the main methods for obtaining data "in the field": that is, in non-laboratory situations of natural language use.

3.1 Ethnography: Field Research and Reflexivity

Ethnography has been, since the time of Boas and Malinowski, the core, foundational method of the discipline of anthropology, and as such is indispensable for interdisciplinary approaches to language and culture. Sharifian (2017: 41) rightly suggests that linguistic ethnography is not so much a "set procedure" for "data collection" as an epistemology, better characterized as a "set of procedures for data collection and analysis". I would also wish to profile a key attribute of the meta-methodological or epistemological stance inherent in ethnography: *reflexivity.* Reflexivity refers to the self-reflection inherent in all qualitative social scientific methods whose object is the elucidation of *meaning* (Sinha 2017a), which, given the indispensable requirement for *interpretation* on the part of the researcher, is irreducible to procedures. The reflexivity of interpretation involves a continuous revisiting of the researcher's findings and conclusions (which are always provisional) in the light of new observations and analyses, and against the background of the researcher's interrogation of their own culturally grounded presuppositions.

Ethnography, it is often said, is an art as much as a science (Carrithers et al. 1990), and as such it is not only an epistemology/methodology for the construction of knowledge, but a *practice* of deliberate and deliberative (inter-)cultural encounter—an encounter that goes under the name of "fieldwork". Grinevald and Sinha (2016: 28) conceptualize the skills involved in fieldwork as "knowledge as practice/practice as knowledge", which

> can be thought of as encompassing both the 'know-how' that underpins field research, and the reflexive stance that is theoretically enjoined upon researchers in all disciplines that employ qualitative research methods. It includes, but is not reducible to, knowledge of how to use technical equipment and software tools.

In the past, the main tool at the disposal of the ethnographer for recording their findings was the (paper) field notebook. The field notebook still plays a key role in critical reflection and noting insights, but the 21st-century researcher is equipped not only with laptops and tablets, but also with sophisticated audio-video equipment that is complemented by software for coding and annotating data.

3.2 Field Experiments and Ecological Validity

Behavioral experiment is at the same time an indispensable part of the methodological toolkit for investigating language, cognition, and culture, and one of the most problematic methods. Experimental design in psychology is predicated on the laboratory context, in which extraneous and irrelevant variables are controlled for; and in which the sampling of participants (and the statistical analysis of the data) usually assumes that they are drawn from the same larger population, sub-groups being differentiated only by clearly defined demographic variables. Cross-cultural psychology traditionally relies upon administering the same experimental procedures, using the same experimental materials, to populations with different national or cultural backgrounds. However, as had already been understood by Gestalt psychologists, the *same* physical stimulus may have *different* meanings for different subjects in different contexts.

The recognition that using standardized materials and procedures can introduce biases that may disadvantage "non-Western" (or ethnic minority) populations was fundamental to the "experimental anthropology" pioneered by Michael Cole and his colleagues (see above). As the distinguished cognitive psychologist George A. Miller put it in his Preface to Cole et al. (1971: ix),

> most psychologists are poorly prepared by education or acculturation to understand the mental processes of people living in … traditional cultures or to grasp the full implications of the fact that such people's experiences have not required them to develop and use many of the cognitive strategies that our Western experience has instilled in us.

For this reason, Cole et al. (1971: 217) rejected the possibility that experimental studies can yield valid cultural comparisons in the absence of ethnographic research to identify settings and practices that can serve to both guide the construction of experimental tasks, and enable the researcher to interpret the participants' responses. This is the reasoning behind the requirement that comparative cognitive studies must employ *ecologically valid* methods (Cole et al. 1978), which will involve at a minimum the adaptation of materials and procedures to local conditions. Similarly, Dasen et al. (2018: 328, 338) recommend that instead of comparing cultural groups' performances on identical tasks, cultural psychologists should employ an ethnographically grounded design involving "a series of cumulative studies, with comparable methods".

3.3 Descriptive and Documentary Linguistics

There is a long tradition of linguists "going to the field" in order to gather information to describe and analyze previously unstudied or understudied languages. The canonical goal of this work was the "Boasian trilogy": grammar, text collection, (bilingual) dictionary; in the service (if the field linguist was a Christian missionary) of the translation of the Bible into the language under investigation. Traditionally, descriptive linguists have used word lists and sentence lists to elicit utterances in the target language. Descriptive linguistics has, during the last two decades, been complemented by documentary linguistics, whose goals may include, alongside documentation of endangered languages, their preservation and revitalization (Austin & Sallabank 2011). The contemporary toolkit of the descriptive linguist includes, as well as linguistic theory, audio-visual recording equipment and elicitation tools, which often take the form of photos, drawings, or video-clips of objects, actions, situations, and narrative sequences. Usually, the researcher will work together with a small number of bilingual native speaker language consultants. The main methodological risk with using language elicitation tasks is that language consultants will reject the task or the task materials as inappropriate, or interpret them differently from the way the researcher expects them to be interpreted. Similar strictures therefore apply to the use of language elicitation procedures to

those mentioned in relation to experiments. The researcher should employ ethnographic methods (observation and interview) in order to establish whether the tasks and depictions are appropriate for the field situation, and acceptable to the language consultants as depictions of whatever is intended to be depicted.

3.4 Other Methods

Investigating cultural conceptualizations does not always involve field research. It may involve analysis of text and speech corpora (Gries 2016), both contemporary and historical, in order to identify specific usages (e.g., culturally specific discourse metaphors). Furthermore, not all research in language and culture is designed to investigate cultural conceptualizations. Performatively and pragmatically oriented ethnographies of communication will often employ the methods of Conversation Analysis (Liddicoat 2011) and its multimodal variants.

3.4.1 Technologies: Making Field Data Ready for Analysis

Ethnographic, field experimental, and field linguistic methods are ways of obtaining data on a given language in more-or-less naturalistic situations. The availability of affordable audio-video recording equipment means that not only conversations and interviews, but also experimental and language elicitation sessions carried out in the field, are nowadays recorded. This brings with it the need for software tools that can prepare the data for analysis (and can often be used for the analysis itself). Video recording makes possible the simultaneous analysis of language and non-linguistic actions, both non-communicative (e.g., the making of artifacts) and communicative (e.g., gesture, gaze, body posture and orientation). Multimodal analysis is increasingly important in the study of language use in its cultural and situational context. A crucial tool for all kinds of language and language-related data is software for annotating and transcribing multimodal interactions, such as ELAN, developed at the Max-Planck Institute for Psycholinguistics.[7] Annotation of utterances in understudied languages will usually take the form of *interlinear morpheme-by-morpheme glosses* (Comrie et al. 2008), in which (in addition to morpheme glosses) one or more linked lines (tiers) annotate utterances employing pre-established coding categories, depending on the specific research questions. Field experimental data can also be coded using annotation and transcription software. Coded data from spontaneously occurring interactions, interviews, elicitation and experimental sessions can be exported if desired to other software, such as spreadsheets, acoustic tools, and/or statistical packages.

3.4.2 Culturally Informed Linguistic Analysis

The next step is the analysis of the data to illuminate salient cultural motivations of grammatical and lexical patterns, or patterns of non-linguistic responses in field experiments, and to identify "the cultural conceptualizations that underlie the use of that language for meaning making" (Sharifian 2017: 41). Sharifian (2017: 41ff) summarizes some data analysis procedures that are commonly and usefully employed in cultural linguistic research. These are: conceptual-associative analysis; conceptual analysis of story recounts; (meta-) discourse analysis; corpus analysis; ethnographic-conceptual text/visual analysis; diachronic/synchronic conceptual analysis. With the exception of corpus analysis, these are all qualitative analytic procedures, for which the researcher may choose to employ either the analysis tools in freeware such as ELAN, or commercial qualitative analysis software such as NVIVO[8] or ATLAS.ti.[9] Corpus analyses, and analyses of field experimental and elicited language data, will also apply quantitative statistical procedures to coded data, using software packages, sometimes in combination with qualitative protocol analyses. However, no analytic procedure, however well-conducted, will yield valid insights into the cultural motivations of

language patterns and conceptualizations in the absence of ethnographically-grounded knowledge of their social, communicative, and historical contexts. For this reason, the crucial importance of field research by native speakers, and of the systematic training of native speaker researchers in field linguistic methods, is increasingly recognized as vital for cultural and typological linguistic research, as well as for language description, documentation, and revitalization (Cabral et al. 2016).

3.4.3 What Is Good Field Research?

In all cases, the qualitative and quantitative analytic procedures that are used in relation to the dataset will be motivated by the research question(s) that the analyst is attempting to answer. *The results of the analysis will only ever be as good as the data that are being analyzed.* It cannot be over-emphasized that the most important methodological requirement for field investigations of language, culture, and cognition is that the researcher must establish and maintain a relationship of trust with the members of the community with whom they are working; including in situations where the researcher is themselves a member of the community and a native speaker. Good field research means carefully explaining the goals of the research to the participants, ensuring that the methods are mutually understood and agreed to be valid, culturally appropriate ways of investigating the topic under investigation. In addition to the ethical norms that should apply to all research with human participants, good practice now requires that the results of the research will be made available to researched communities in a way that they can understand, in order to use them for their own purposes, including education for revitalization.

4. Key Research Topics

4.1 Color

The domain of color has been central to the rise and fall of what came to be known as the 'Whorf hypothesis': the 'linguistic determinist' interpretation of linguistic relativity. Popular science has long employed the trope of "the many Eskimo names for snow".[10] This gave rise to the hypothesis that *codable* categories (those that are lexicalized, preferably by single morphemes) are more cognitively and perceptually salient than categories that are not lexically coded in this way. The hypothesis received some (subsequently contested) support from experiments on color recognition and recall (Brown & Lenneberg 1954). An opposing universalist and evolutionary hypothesis was proposed by Berlin and Kay (1969), who proposed an invariant, seven-stage sequence of emergence across languages of 'basic color terms' (BCTs) (which must consist of single morphemes referring *only* to color, and not to any other material substance or attribute). According to their hypothesis, all languages have words for black (dark) and white (light); if they have three BCTs, the third will be red; if they have four BCTs, the fourth will be green, or yellow, or a term covering both green and yellow; and so forth up to a maximum of 11 BCTs, which happens to be the number in English.[11] The BCTs were hypothesized to name categories centered on universal *focal colors* rooted in the neurophysiology of color perception (Kay & McDaniel 1978). Support for Berlin and Kay, and evidence against the codability hypothesis, was provided by research by Rosch (1973) who showed that speakers of the Dani language of Papua New Guinea, which has only two BCTs (for light and dark), learned and remembered invented names for other focal colors (unlabeled in the language) better than invented names for non-focal colors.[12]

The BCT research paradigm depends upon the use of a particular elicitation procedure, using the Munsell color chart, which consists of an array of color samples organized according to gradations of hue, brightness, and saturation (Nickerson 1940). This use of 'disembodied and disembedded' stimuli; the assumption that the semantic domain of color is categorized on the basis of unmediated sense perception; the nativist account of focal colors; the neglect of

social-historical and technological influences on color terminology; and the theory's ethnolinguistic bias have all been criticized by a number of authors, of universalist (Wierzbicka 1990, 2006), relativist (Lucy 1997), and critical-historicist (Saunders 2006) persuasions. Wierzbicka (1990: 99) argues, for example, that

> colour concepts are anchored in certain 'universals of experience' [that] can be identified as day and night, fire, the sun, vegetation, the sky, and the ground … to be able to communicate about [colour sensations] we project them onto something in our shared environment.

Lucy (1997: 341) argues in a similar vein that "communicatively relevant encodings of visual experience do not lie 'in there' in the biology but out there in socially anchored linguistic systems". Saunders (2006: 96) argues that these 'socially anchored linguistic systems' include the philosophical and scientific discourses that surround the notion of 'visual perception', arguing that "if 'colour' is a coherent concept at all it is an artefactual kind, not a natural kind".

Viewed in this light, the differentiation of BCTs from 'non-basic' color terms; their identification with an inventory based upon 11 English color terms—that are not in strict correspondence with, for example, 11 identified Chinese BCTs; and the BCT research paradigm as a whole, might be regarded as methodological artifacts flowing from a "radical universalist position [that] not only seeks universals, but sets up a procedure which guarantees both their discovery and their form" (Lucy 1997: 331–332).

Lucy continues (1997: 332) by stating his own conviction that "there are universal patterns to the semantic treatment of the phenomena we call color perception, but … they bear a very indirect relationship to the findings of the [BCT] tradition". Despite this, it should be acknowledged that the BCT program has resulted in a large cross-linguistic database of color terms, and later research in the BCT tradition has modified and elaborated the theory in respect both of hypothesized neurocognitive processes and of cultural influences on categorization (Maclaury 1997; Kemmerer 1999).

What, though, of the question that originally provoked modern research into language and color: universalism vs. relativity? Roberson et al. (2006: 160) summarize the results of their extensive research program as follows: "cross-cultural studies of colour categorization [in adults] have found consistent differences in a range of perceptual and memory tasks, systematically linked to the colour categories in each culture". Roberson et al. also summarize the results of their child developmental studies (2006: 166–168):

> The advantage [in naming and memory tasks] for items [central to the BCTs] … increased throughout the longitudinal study … focality is not universal but … language dependent [and] children … progress gradually from an uncategorized organization of colour based on similarity to a structured organization of categories that varies across languages and cultures.

These results both support a Vygotskian interpretation of neo-Whorfian effects, and (although there is not space here to expand this point) provide a point of contact with the revised BCT account proposed by MacLaury (1997).

4.2 Space and Time

The cognitive and linguistic domains of space and time occupy a special place both in Western philosophy of mind, dominated by universalist assumptions, and in cognitive linguistics, in which

conceptualizations of spatial relations have been fundamental to cognitive semantics, cognitive grammar, and cognitive typology (Lakoff 1987; Langacker 1987; Talmy 2000). Space and time have been key to explorations in the last three decades of variation in cognition and language, and to the development of neo-Whorfian and post-Whorfian theories.

4.2.1 Spatial Frames of Reference (FoR)

Spatial FoR refers to the *coordinate system* in terms of which the spatial relationship between a figure and ground is conceptualized. For example, the same spatial scene, in which the speaker stands outside and at the stern of a boat, downstream of, and facing the boat, may be conceptualized as 'the boat is in front of me' (*relative* FoR), 'I am behind the boat' (*intrinsic* FoR), and 'I am downriver from the boat' (*absolute* FoR). The large-scale cross-linguistic research program on spatial FoR carried out by Stephen Levinson (2003) and colleagues was fundamental to the re-evaluation of linguistic relativity from the 1990s onwards (see also Brown 2015). They first documented an astonishingly wide degree of variation between languages in their spatial FoR, including absolute FoR languages in which cardinal points (NSEW), topography, or geography are used for all spatial linguistic conceptualizations; so that a speaker must refer to a companion as being for example 'to the south', 'upriver', 'towards the mountains', 'towards the ocean' (as opposed to 'to the left'). They further documented that differences in speakers' use of co-speech gestures parallel differences in linguistic FoR, a finding that prefigured the widespread use in CL research of multimodal communication methods. Finally, they showed that participant strategies in tasks involving memory for spatial arrays also parallel differences in linguistic FoR. Since the project sampled languages with the same spatial FoR but otherwise different cultural profiles, it was an important support for the hypothesis that differences in non-linguistic cognition (as established by experiment and elicitation) are due to language variation *independently* of cultural variation. This is a key tenet of present-day neo-Whorfian theories and associated research designs, although Brown (2015: 302) calls for more research into the "interpenetration" of language, culture, and thought in cultural contexts.

4.2.2 Cultural Embodiment in Spatial Language Development

A contrasting (and explicitly interdependence-oriented) approach was taken in cross-cultural and cross-linguistic research on children's development of spatial language and concepts by the present author and his colleagues (e.g., Jensen de López et al. 2005), who compared language comprehension strategies and non-linguistic action imitation in Danish, Japanese, and Zapotec acquiring children. The research led to the substantive conclusion that

> language acquiring children are 'predisposed', through their experiences of interaction with the material world as this is culturally presented, and through the mediation of cultural practices, to employ [cognitive and linguistic] strategies that are consistent with the specific semantics of the languages they are acquiring. Acquisition of, and experience of using, language subsequently entrenches this socio-culturally based cognitive difference (rather than, as in the conventional reading of the Whorfian hypothesis, causing or determining it).
>
> *Sinha & Jensen de López 2000: 36*

As well as offering a theoretical account based on the concept of extended cultural embodiment, this research also reinforces a methodological tenet that is central to cultural psychology (Valsiner 1995)—namely that language and culture cannot be conceptualized as "independent variables".

4.2.3 Temporal Concepts in Language and Culture

Languages conceptualize time in very different ways, and the study of temporality and 'time reckoning' in different cultures has been a major topic in anthropology for many years (Munn 1992). It has often been noted that until quite recently different cultures, faith groups, and nations used different calendric systems, each with its own cultural or religious significance. To this day, although the world has adopted a single standard calendar for official life (ISO 8601:2004: originally the Western Christian luni-solar Gregorian calendar), different calendars (for example the traditional Chinese lunar calendar) coexist with it in many cultures.

Calendars are historical inventions, as are clocks (Postill 2002), whose function is to measure 'time' in terms of intervals of duration. For this reason, calendar and clock time can be referred to as *metric time* (Sinha & Gärdenfors 2014). It has also been remarked (e.g., Evans-Pritchard 1940) that in many cultures calendar and clock time is absent, vague, or subordinated to 'ecological time', but little attention has been paid to the cultural linguistic analysis of non-metric time concepts. Recent research has investigated *event-based time* in Amazonian cultures and languages that have small number systems (of the kind already noted by Boas—see above) and correspondingly have no metric time systems such as clock or calendar time. This research has shown that event-based time intervals are organized as complex systems of lexicalized time intervals, grounded in and indexed to the seasonal and diurnal rhythms of the natural environment, and the regulative norms governing social life and human development (Sinha et al. 2011; Silva Sinha et al. 2012; Silva Sinha 2019). Event-based time intervals (unlike metric time intervals) are found in all cultures and languages, and all metric time systems can be assumed to have culturally-historically evolved out of them. For example, the "canonical hours" for prayer in Christian monasteries (as codified in medieval "books of hours": Brown 2017) evolved into a more regular, metric 'clock time'.

4.2.4 Space-Time Metaphorical Mapping

It is difficult in English to speak of temporal relations between events without employing words and constructions whose primary meanings are spatial. For example, we may party *through* the night then take a day off *on* Sunday. We may be *coming up* to graduation, and the deadline for an essay may be rapidly *approaching*. The conceptualization of time in terms of spatial relations and motion in space is to be found in a very wide range of languages and cultures (Haspelmath 1997; Núñez & Cooperrider 2013) and is probably present in the vast majority of languages. It has been proposed on this basis that the conceptual metaphor TIME IS SPACE is universal (Lakoff & Johnson 1999; Fauconnier & Turner 2008).

Constructions such as 'my birthday is coming' and 'I'm coming up to my 30th' involve either the imaginary movement of the viewpoint of an experiencer along a mental timeline (MT), or the imaginary movement of an event along an MT. In the majority of languages the viewpoint is that of an experiencer who is facing towards the future, but in the Andean language Aymara there is evidence both from language and from co-speech gesture that the experiencer is facing the past (Núñez & Sweetser 2006). Do we, however, find a mental timeline represented in all languages? If the MT is an innate property of the human mind, as hypothesized by Hoerl and McCormack (2019), we would expect that to be the case. However, it is not: several unrelated languages have been documented in which there appears to be no mental timeline manifested in speech, gesture, or sign (e.g., LeGuen & Pool Balam 2012; Le Guen 2017; Silva Sinha 2019).

In the Amazonian languages studied by Silva Sinha (2019), not only was there no evidence of a linguistic MT, but the metaphors for time were based not on spatial direction and orientation, but on embodied perception and cognition: for example THE PAST IS IN MY HEART; THE FUTURE IS IN MY HEAD. These findings support a post-Whorfian account in which the mental timeline has a cultural historical origin, based in the invention of symbolic cognitive artifacts such as calendric systems, rather than being innate.

4.3 Self and Identities

The previous two topics have been central for many years to research and theory development in language, cognition, and culture. The third topic I briefly address here is of more recent interest to cultural linguists in the cognitive tradition, but similarly to the other two topics it is rooted in fundamental theoretical propositions of cognitive linguistics, in particular *embodiment theory*; and in continuing work on the linguistic expression of 'the body in the mind' (Johnson 1987). An important research strand in the investigation of cultural conceptualizations has been the comparative study of the metaphorical mapping of body parts and internal organs in different cultures to mental processes such as thinking and emotion—for example, vision or hearing as metaphorical loci for understanding; the heart vs. the abdomen as the metaphorical seat of emotion (e.g., Evans & Wilkins 2000; Sharifian et al. 2008; Yu 2009). However, it is only more recently that researchers have turned their attention to the cultural conceptualization of the individual locus of the human mind: the self.

In contrast, the study of cultural concepts of the self, and their historical origin, is a relatively well-established area of anthropological psychology (Marsella et al. 1985) and philosophical anthropology (Taylor 1989). Cross-cultural psychological studies have shown that Western (principally American) experimental participants tend to conceptualize the self as *independent*, bounded, and autonomous, while non-Western (principally East Asian) participants tend to conceptualize the self as *interdependent*, relational, and rooted in networks of social obligation (e.g., Markus & Kitayama 1991). Such studies have resulted in interesting generalizations, but they risk overgeneralization, over-simplification, and the tendency to bracket highly variant cultural formations together. Anthropologists have tended to focus less on conceptualizations of self, and more on socially situated and discursively constructed concepts such as identity and belonging, in specific cultural contexts, and especially in relation to gendered, ethnic, and migratory identities (Casey & Edgerton 2005).

Cognitive-cultural linguists are now beginning to turn their attention to this field. A notable and important recent study by Lu (2019) focuses on migrant selves and identities in the Chinese diaspora population of Australia, employing methods and concepts both from embodiment theory, and from the performative approach of ethnography of communication. Another recent collection focuses on self and identity from both cognitive-cultural linguistic and interdisciplinary perspectives (Silva Sinha et al. 2020). It can be anticipated that this topic (or cluster of topics) will receive increasing attention in coming years, with an orientation to the complex and culturally situated inter-relations between self, identity, and (inter-) subjectivity in communication and cognition.

5. Future Directions

Over the past decades, an increasingly rich variety of languages has been studied by cognitive linguists. Cognitive linguistics today is a proudly multilingual enterprise. It is no surprise, then, that cognitive linguists have shown an increasing interest in the diverse cultural models and schemas that motivate the semantics and grammar of different languages. This development has given rise, as we have seen, to the growing engagement of researchers in the field of CL-based cultural linguistics. I have no crystal ball, but I will venture the following predictions:

- Research topics will expand beyond those that are most directly based in embodiment theory, conceptual metaphor, and related core CL areas, to encompass topics and methods currently mainly studied in anthropological linguistics. There will be an increasing engagement by linguists with other social sciences studying culture, mind, and language, especially anthropology and psychology.

- The fundamental proposition of CL, that language is grounded in the human brain and body in its ecological context, will be expanded to explicitly recognize that this ecological context is socioculturally constructed and socioculturally variable, and that *all* cognition is socioculturally situated cognition.
- There will be increasing acknowledgement that neither 'cultures' nor 'languages' are essentialist entities that are uniformly distributed amongst distinct communities. Cultures interact, they are composed of individuals who do not all share the same cultural capital, and who may have multiple cultural identities. Languages influence each other through competition as well as contact, and multilingual speakers possibly outnumber monolingual speakers in the world's population. Our own cultural models as language researchers will increasingly need to accommodate these realities.

Acknowledgements

I am grateful for the insightful comments of Peter Austin and John Leavitt that, I hope, have helped me improve this chapter. Remaining shortcomings are entirely mine. I also wish to express my sadness at the untimely death in May 2020 of Farzad Sharifian, who contributed so much to the field of cultural linguistics, and still had so much to give.

Notes

1 Cited in Spencer-Oatey (2012: 1).
2 While Ferdinand de Saussure is usually credited with founding modern linguistics, Boas, with his focus on "lesser known" languages, might be regarded as having an equally valid claim. Usually, however, he is seen as "the father of American anthropology". The overview in this section of language and culture in anthropology focuses on the Boasian tradition, which continues to be influential, especially in the Americas. Sadly, despite the pioneering work of Malinowski, the language-culture relationship has received little attention in later British social anthropology (Henson 1974), other than through a recent orientation in social constructionist theories to discourses and the discursive construction of subject positionings. Both this approach, and the Continental European tradition of structuralism and post-structuralism, lie outside the scope of this chapter.
3 Boas was apparently the first scholar to use in English the term 'cultures' in the plural; although the plural had previously been used by German cultural psychologists such as Steinthal and Wundt who influenced Boas (Leavitt, p.c.).
4 This author (Sinha 2017b: 168–170) distinguishes a Boasian "positive relativism" from a "negative relativism" that can be identified with solipsism and scepticism.
5 Although Piagetian and Vygotskian theories have often been cast as conflicting with each other, more recent evaluations have stressed that they can be seen as complementary (Bronckart 2012).
6 It is worth noting that non-human animal cognition is nowadays known to be more similar to that of humans than was thought by the originators of the theory of semiotic mediation. This issue is beyond the scope of this chapter, but in this author's view it remains plausible to attribute many of the human/non-human cognitive differences that do exist to the use by all human communities of language and other communicative and cognitive signs.
7 See Sloetjes and Wittenburg (2008). ELAN software available for download from https://archive.mpi.nl/tla/elan
8 www.qsrinternational.com/nvivo-qualitative-data-analysis-software/home
9 https://atlasti.com/product/
10 Although it has sometimes been claimed that 'the many Eskimo names for snow' is an invented fiction, the example, with detailed linguistic specification, can in fact be found in Boas (1911: 25–26).
11 At least two languages, Russian and Polish, have one more BCT than English (Davies & Corbett 1994; Wierzbicka 1990).
12 This work set the scene for the development by Rosch of *prototype theory* (see Chapter 10).

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Journal

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Related Topics

multimodal construction grammar: from multimodal constructs to multimodal constructions; embodiment; standard and extended conceptual metaphor theory; construal; multimodality; cognitive pragmatics; thinking on behalf of the world: radical embodied ecolinguistics; cognitive sociolinguistics

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24

COGNITIVE LINGUISTICS AND FIGURATIVE LANGUAGE

Herbert L. Colston

1. Introduction

Cognitive Linguistics was founded on, among other things, the notion of the "Cognitive Commitment". This is the idea that any construct, process, mechanism, functionality, or other such *thing*, we propose occurs in humans when they use or encounter language, must adhere to what we know about how human cognition, as a more general arena of functioning of which language is but one type, operates. If a language functional construct, etc., is not cognitively or psychologically valid, then it should not belong in an explanation residing in Cognitive Linguistics. We must build explanations about how people produce language that are in coherence with what we know about general human cognitive functioning.

As pertaining to figurative language, or the suite of different forms of language exhibiting a generally pronounced dissociation between uttered (or written or signed) linguistic surface form, and the meaning intended in the usage of the form, cognitive linguistics with its cognitive commitment has yielded significant progress. These different types of figurative language dissociate from their surface forms in different ways (i.e., ***metaphor***—talking about one thing in terms of another (e.g., "Don't be afraid to approach that professor, he's a teddybear"), ***metonymy***—using an attribute or part of something to refer to the entirety of that something (e.g., "get your ass over here!"), ***sarcasm*** or verbal irony—appearing to utter something like the opposite of what one intends (e.g., in describing a grubby hotel room with a broken door lock, "oh yeah, I felt totally safe"), ***idioms*** and ***proverbs***—relatively fixed phrases with varying opaqueness and decomposability, with meanings different generally from their surface forms, often used for succinct meaning-capture, and occasionally for advocacy (e.g., "bite the dust", "make hay while the sun shines"), ***hyperbole***—over- or understating the magnitude of something (e.g., "only the worst night ever"), and others). Many accounts in cognitive linguistics have leveraged different phenomena from cognitive psychology/science to explain how producers and comprehenders deal with these different kinds of meaning dissociations found in forms of figurative language.

2. Historical Perspectives

Metaphor—Probably the most impactful account in the cognitive linguistics of figurative language, both in terms of influence as well as debate, has been conceptual metaphor and its later

iterations (Lakoff & Johnson 1980; Gibbs 2017). At the very least it is one of the older cognitive linguistic accounts applied to figurative language. According to this view, metaphor is not merely a linguistic construct where, as described above, one thing is *discussed* in terms of another. Rather, metaphor is a much more deeply seated cognitive operation/construction whereby we *conceptualize* one thing in terms of another. On this view, conceptual metaphors can manifest themselves in how we speak, think, reason, gesture, create, feel, or essentially any other similar human experience or behavior.

Conceptual metaphor not only borrowed constructs from cognitive psychology/science, but it also contributed to those disciplines by providing new ways to conceptualize meaning itself, its representation, its creation, and its usage in the mind and for communicating. So conceptual metaphor really was a novel idea, garnered in part by noting the systematicity of linguistic metaphors observed in language (e.g., how so many of them align along common structures such as, UNDERSTANDING is SEEING, ACCOMPLISHMENT is MOVEMENT THROUGH PHYSICAL SPACE, GOOD is UP/BAD is DOWN), but also borrowing ideas about knowledge structure and organization from cognitive psychology/science (e.g., schemas, scripts, frames, etc.). Conceptual metaphor thus provided a new framework for thinking about meaning, borrowing from both linguistics and cognitive psychology/science, but then also giving that framework back to both disciplinary sources, enabling them to advance their explanatory repertoires and move more into alignment and cooperation.

Later iterations of conceptual metaphor which posited that the building materials for conceptual metaphors were actually embodied experiences ensconced neurally in the form of generic patterns of neural activation, mostly in motor activity and sensory functioning but more recently in emotional processing, have continued in this vein (Bergen 2012; Gibbs 2006; Glenberg & Kaschak 2002). These patterns of activation, referred to as embodied simulations, provide a new way to conceptualize the notion of meaning itself. On this view, meaning is not just some abstract knowledge representation in a semantic memory system, nor is it merely definitional material held in a mental lexicon (at least for some sources of meaning). Rather, it is a form of generified motor and/or sensory experience with the things referred to by the language being encountered.

For instance, if you hear the phrase, "the man is pounding on his hand drum", you run a simulation of actually seeing or hearing a person playing a hand drum forcefully. Or, if you have motor experience in this regard, you can additionally, or as a combination with the sensory simulation, run a motor simulation of actually playing such a drum with your hands. These patterns are very similar to what would be observed in the motor and sensory areas of the cortex were the hearer *actually* seeing a hand drum being played or *actually* playing that drum.

This new form of conceptualizing some of what meaning even is, affords much added nuance to comprehension products stemming from embodied simulations. For instance, a person who has actually seen, heard, or played themselves, the West African drum known as a djembe, may know that the drum can be loud, it has a very earthy skin-on-skin sound to it, yet at the same time can have deep tonal and bright ringing sounds to it, depending on how it is struck. And if you've played one, you know it can make your arms tired and your hands hurt. All this embodied meaning—meaning wrought through actual sensory and motor experience with this kind of drum, can make its way into understanding figurative (i.e., metaphorical), but also non-figurative uses of "hand drum" in language.

For example, a person hearing the metaphor, "the man really cares about this issue, that's why he's pounding on his hand drum about it", might glean some of that embodied content in their comprehension products (i.e., the drum is loud = *the issue is important*, the sound can be heard by many people = *the man is trying to spread word about the issue*, the sound is both deep and high pitched = *the issue is complex and broad ranging*, the rhythm is steady and repeating = *the man stays on message*, the playing of the drum can hurt your arms and hands = *the issue is worth sacrificing over*, etc.).

Although conceptual metaphor has been influential as an account bringing in cognitive psychological/scientific phenomena toward an explanation of use and comprehension of one kind of figurative language, it has also been controversial (Gibbs 2017). Other evidence has shown that different cultures and different languages themselves can alter the kinds of embodied simulations people might run when comprehending or producing metaphor, and the resulting meanings derived (Majid, Gaby, & Boroditsky 2013; Majid 2019). These findings suggest that accounts based solely on presumed-to-be-universal or at least wide-spread embodied sources, enabled by our presumed-to-be-largely-similar motor, sensory, and emotional neural systems, cannot be the entirety of the story.

Metonymy—Cognitive linguistic accounts of metonymy were also among the first explanatory frameworks arising from the cognitive commitment. These accounts have not received the same level of empirical evaluation and resulting debate, however, relative to metaphor, and at first they were very much in the shadow of conceptual metaphor. But in some ways they have incorporated content from cognitive psychology/science more extensively than conceptual metaphor.

Conceptual metonymy was initially conceived as part of the same set of general cognitive operations espousing conceptual metaphor (i.e., source domain components being mapped onto target domain components). The difference between the two accounts being that for conceptual metaphor, the source domains and target domains were distinctly separate things. For conceptual metonymy, though, the domains were the same, but the mapping was between sub-components versus entireties (e.g., part standing in for the whole, as in "All hands on deck"). Later treatments tended to use this distinction to define metonymy as essentially independent from conceptual metaphor, with its own resulting sets of pragmatic effects (Dirven & Ruiz de Mendoza 2010; Ruiz de Mendoza & Otal Campo 2002; Dirven, 2005; Colston 2015).

Conceptual metonymy borrows very much from traditional and mainstream cognitive psychological/science research on categorization, knowledge structures, semantic networks, and memory, among others. An enormous body of work has investigated how people form, develop, maintain, and adjust mental categories (e.g., exemplar, prototype, family resemblance, etc., accounts). How these categories are structured is another related line of traditional research in this area of cognition (e.g., schemas, scripts, frames, etc.), including how selection of one portion of the structures can lead to activity elsewhere in the structure (e.g., spreading activation). A huge literature on human memory, and especially how it operates, and fails to operate "correctly", is tied to this work on categorization and knowledge structure. For instance, if a person hears a short vignette describing a customer making a purchase at a fast food restaurant (a highly schematized knowledge structure), they will commonly make mistakes on a later memory test for items that weren't explicitly stated in the vignette, but are part of the schema (e.g., the customer tapping their "chip card" to pay for the food).

Conceptual metonymy, in basing comprehension on the general notion of substitution, or a mentioned referent (e.g., a container, "dish") standing in for another (e.g., the contents of the container, the food), as in "that dish is delicious", makes inherent borrowings of constructs like schemas, semantic networks, spreading activation, etc., in its proposed functioning. These linkages are not always specifically stated, perhaps due to a form of parallel evolution having taken place. But analogous terminology and functionality (e.g., "encyclopedic knowledge") relies heavily on the same basic cognitive functioning.

Conceptual Integration/Blending—A third major contribution from cognitive linguistics, enabled in part by the cognitive commitment, can also apply to metaphor processing, as well as other forms of figurative language. According to this view, rather than the strict and predominantly unidirectional mapping initially proposed by conceptual metaphor, from a source to a target domain, a different underlying model is proposed, that of mental input and blended spaces. For example, in the metaphor, "my marriage is a tug-o-war", both source and target domains are seen

as input spaces which combine to form a blended space. By this process, aspects of both source and target domains can reside in the interpretive product (e.g., not only is the confrontational aspect of a tug-o-war mapped onto a marriage, but the division-of-labor aspect of many marriages (e.g., which partner does which tasks) can also serve to define aspects of the tug-o-war—that the confrontation is about task division rather than, say, fighting over possession of an object, like a bedroom blanket, a not uncommon marital dispute, but not likely what the metaphor would be referring to) (Fauconnier & Turner 2002; Gomola 2010).

This form of generic integration between two or more invoked knowledge structures is a common process discussed by a variety of areas in cognitive psychology/science, and indeed, seems a fundamental thing the human mind does. Indeed, at a very base level we must continuously integrate information coming in from separate sensory domains to understand the environment around us. A hunter in a hunter/gatherer society, for instance, must ascertain the situation regarding some currently pursued prey from traces in the environment (e.g., tracks, scent markings, etc.), as well as from more direct information from the prey (e.g., falling leaves indicating the prey has climbed a tree, sounds of snapping twigs suggesting it has moved to an adjacent tree, flickers of red color implying the animal is wounded, etc.). In more urban settings the same situation holds, often under fast-paced and pressured conditions (e.g., imagine the plot of nearly any crime detective television/internet program—people integrating different sources of information to create a coherent and plausible narrative of a crime/perpetrator).

More specific to cognitive psychological/scientific empirical research, a number of specific research areas investigate just this kind of integration process working on different activated streams of incoming and stored knowledge (e.g., generic problem solving, insight problem solving, deductive and inductive reasoning, etc.). And even parallel accounts of language processing from cognitive psychology/science, in this case involving non-figurative language, have at their core a very similar kind of integration process (e.g., situation model building in discourse processing and the updating that continuously takes place as new information is encountered). And, most precisely, active and passive kinds of information activation and suppression, proposed for the development of comprehension products in blending theory, are also found in the integration processes in these other areas of cognitive research. So again, as with conceptual metonymy, although the specific overlaps with cognitive psychology/science are not always made explicit, the two sides are in alignment, at least in some ways, perhaps unintentionally, demonstrating the cognitive commitment's relevance in cognitive linguistics.

Other Figures—Rather than large accounts addressing the entirety of predominantly single figurative forms, in a more piecemeal fashion other indications of the cognitive commitment being followed in accounts of figurative language can be found. Prototype accounts have been used to discuss the range of variability in idioms, verbal irony, and hyperbole for instance, across their structure and internal characteristics, their surrounding contexts, as well as their general polarity (Penttila 2010; Gibbs 2000; Colston 2007).

For instance, to just take hyperbole as an example case, roughly half (51%) of some 447 instances of hyperbole recorded by authentic adult middle American speakers contained extreme case formulations (e.g., "never", "always", "continuously", "completely", etc.). Almost a quarter of the hyperbolic utterances contained specific quantities, and among these 19% (of all utterances) used textual or digital numerals (the utterances were recorded in written form). The hyperbolic speaker's expectations were said to have been violated in just over a third of the instances (34%). Expectations were reported to not have been violated also in just over a third of the cases (37%). In the remaining cases the status of the speaker's expectations was unknown. Hyperboles also predominantly exaggerated up (80%) rather than down (i.e., stating magnitudes greater than their actual levels), as in saying, "It's broiling hot in here" about a warm room. Also, the expressive polarity in using hyperbole was almost always negative. Only 9% of the instances were reported *not*

to be negative when including ambiguous cases. When including only unambiguous instances, only 6% of the hyperboles were reported to *not* be negative in polarity.[1] So it appears the prototypical hyperbolic natural utterance, at least in the culture and region where the data were gathered, uses exaggerations of actual magnitudes to complain of one's dissatisfaction with those magnitudes—in essence, inflating a departure of some magnitude from one's desired/preferred/expected level, to draw attention to that discrepancy, often for the purposes of complaining about it (Colston 2007, 2015).

A number of known, straightforward, and mainstream phenomena from cognitive psychology/science are invoked in this assessment of prototypical and atypical instances of hyperbole. One is the use of inflation of something to draw attention to it. It is a straightforward finding from perception and cognition that things which are distinctive attract attention over things which are not distinctive. Moreover, a common means of making things distinctive is to make them bigger in ways discernible to our senses. We see this in everything from animal threat displays to advertising or news headlines. So when a speaker wishes to point out that some magnitude in their environment is not as they would prefer, desire, or expect, a straightforward way to bring that discrepancy to people's attention is to inflate it—state it as greater than it actually is.

Another cognitive phenomenon often leveraged by hyperbole is humor. Whichever particular humor theory one might espouse, a common thread among these accounts is that discontinuity is a major trigger of humor. Specific mechanism underlying this invocation of humor aside, hyperbole is a natural case for the invocation of humor because the exaggerated magnitude in the stated utterance can stand out drastically from either the target magnitude or the more preferred/desired/expected one. Humor can also provide a range of functions to the hyperbole, depending on an enormous number of factors (e.g., it can render the negativity in the complaint more palatable by delivering it along with humor, or it can enhance the level of perceived criticism by winning over the addressee to the speaker's perspective—the hearer bonds with the speaker via the humor and accordingly adopts and agrees with the speaker's complaining stance, etc.).

Many similar descriptions are possible, for how snippets of phenomena from cognitive psychology/science can apply to the processing, comprehension, and pragmatic effect computation of a wide array of figurative forms. For instance, assimilation and contrast effects have been applied to verbal irony (Colston & O'Brien 2000a, 2000b; Colston 2000, 2002) and have been used to compare verbal irony and rebuttal analogy (Colston & Gibbs 1998). Cognitive biases (e.g., for positivity) have been applied to verbal irony (Matlin & Stang 1979) and indirect negation (Colston 1999). The invocation of polarity gradations and other kinds of schemas have been used to compare verbal irony and hyperbole (Colston 1997a, 1997b), and to discuss proverbs and their comprehension (Gibbs, Colston, & Johnson 1996; Gibbs, Johnson, & Colston 1996).

And, in application not just to one figure or a small set of figures but to figurative language in general, another process from cognitive psychology/science has been invoked to describe a particular pan-figural pragmatic effect which can be leveraged—that of *mastery display* (Colston 2015, 2019). This process involves a form of meta-reasoning applied to figurative language processing. Many forms of figurative language do two sort-of oppositional things at the same time. They enrich the amount of information leveraged in and by an utterance, yet they also do this with what is usually a much more compact construction, relative to the expressed meaning being attempted non-figuratively—*they increase meaningful density*. Using the variety of cognitive psychological/scientific processes described above, plus others, figures leverage a lot of rich, nuanced meaning. But by compacting this meaning into an efficient, and apt, indirect figure, in the midst of the meta-reasoning process just mentioned, figurative language can *impress* its receiver. A speaker can demonstrate their skill and prowess at using language when they invoke figurative mechanisms, and this can become apparent to receivers of the language. Such a positive impression can have many complex and interacting knock-on effects in the discourse and interaction (i.e., it can bond the interlocutors, the receiver may be more prone to persuasion, people may perform richer

interpretation on the speaker's subsequent productions, the speaker can gain social status, etc.) (Colston 2015, 2019).

Moreover, beyond achieving mastery display, a number of other pragmatic effects are also possible through figurative language interacting with various cognitive processes. Even one of the most basic cognitive processes ever proposed, simple association (i.e., two things are encountered together with some frequency such that they are associated in a person's semantic representation of the things, as in "snow" and "ice", "doctor" and "nurse", etc.), can be used by figurative language to leverage meaning. For example, a person has encountered some bit of purportedly exciting news that they actually find completely uninteresting. One way to express themselves in this situation would be to use sarcasm, as in saying, with typical sarcastic prosody and accompanying cues, "Oh, how exciting!" They would also likely be understood correctly as not really being excited but instead finding the news boring. But had they couched their sarcasm in some form which is *associated* with perhaps a childlike register, or stereotypical naïveté, or even a more quaint historical era, they would have likely enhanced their degree of expressed derision. Consider for instance, having instead said, "Oh, golly gee!", or "Oh, heavens to Betsy". The simple association of these two constructions with the kind of innocent or naïve, register or era, etc., would likely change the flavor of the meaning expressed.

3. Critical Issues and Topics

Despite this successful adoption of the cognitive commitment by cognitive linguistic accounts of metaphor, metonymy, and a variety of other forms of figurative language, two general criticisms may still be directed at attempts to explain figurative functioning this way. One is the relative sparsity with which different areas of cognition appear in cognitive linguistic accounts of figurative language. The other is the cognitive commitment having stopped at cognition, rather than encompassing all the other modes of human functioning, all of which interact with cognition.

The Full Expanse of "Cognition"—A huge array of phenomena in cognitive psychology and cognitive science can have marked effects on figurative (and other) language production, processing, comprehension, etc., and yet rarely are discussed in most accounts in cognitive linguistics. These range from traditional accounts of attention, through core cognitive processes such as memory, up to sophisticated kinds of reasoning, thinking heuristics, biases, and many others. Reviewing all of these areas is beyond the scope of the present work, but by way of example of what is being missed, a short review of some phenomena concerning memory and how they affect figurative language is provided.

Studies of human memory are among the oldest in the field of cognitive psychology, and indeed psychology as a whole. People started conducting rigorous evaluations of the performance of human memory in the latter half of the 19th century, and memory research rose to become one of the most methodologically complex areas in which to study human cognitive functioning. The complexity was necessary because so many things affect memory performance. Factors such as what is being learned or what is already known, for which memory can be tested, affect memory performance. *How* that new material is learned, if not already known, affects memory. The durations of exposure to new information and the length of time allotted to the memory evaluation or test, all affect performance. Even the amount of time between study and test, and what is done by or to the person during that interim, affects memory.

And there is a huge array of ways to evaluate memory. You can just ask people to report, orally or in writing, what they recall (e.g., free recall). Cues to help people remember things can be provided, such as the first letter of each word from a learned list (e.g., cued recall). Or you can even give people some of the material they have learned, along with other material, and ask them to make yes/no decisions on each individual item in terms of whether they studied it before (e.g., recognition tests). There were even memory tests devised to evaluate memory without people knowing their memory was being evaluated (i.e., implicit memory tests).

These and many other methodological tools helped researchers build up a fairly robust account of how memory works and fails, its different guises and manifestations in thought and behavior, how it changes as we age and when we do multiple things at once, and when we are under stress. In short, we have a pretty decent understanding of how memory works. But rarely is any of this knowledge taken into direct consideration in cognitive linguistic accounts of figurative language.

***Anchoring Effects*—**Consider for instance a well-established effect in human memory such as anchoring. To illustrate, consider a standard anchoring task. Imagine a group of randomly selected Canadian residents are asked to guess the distance between Halifax and Vancouver. Before hearing this question, though, they are asked first to answer a yes/no question about that distance. Half of the people (again, chosen randomly) are asked, "Is the distance between Halifax and Vancouver greater or less than 1,000 kilometers?" The other half of the people are asked, "Is the distance between Halifax and Vancouver greater or less than 10,000 kilometers?" The results are compelling. The group asked the "1,000 kilometers" question, reliably gives an average estimate that is smaller than that of the group asked the "10,000 kilometers" question, even though both groups are generally equally accurate in answering the initial "anchoring" questions. Also, given random assignment, the groups start the task equally knowledgeable about this actual distance. Thus something about the anchoring question must cause the difference in estimates.

The explanation for the difference, although differing in subtleties depending on which specific model is used, is essentially that people get anchored on an initial quantity they hear and consider, and afterward must make subsequent estimates with those initial quantities still in memory. People don't tend to deviate much from those initial anchoring quantities, such that the two groups as described here end up giving different estimated distances (the actual distance from Halifax to Nova Scotia is 4,444 kilometers).[2]

If we think about this effect in light of, say, hyperbole comprehension, we can see a potential influence. Even though people are reasonably good at comprehending hyperbole correctly (i.e., not taking literally a person hyperbolically reporting on, say, their ski vacation by saying, "we got ten meters of snow last night!"), according to the anchoring effect, this hearer would likely form a different idea from (i.e., comprehend differently) language describing the ski resort hyperbolically, relative to equally enthusiastic but non-hyperbolic language describing the amount of snow (i.e., "we got half a meter of snow last night!").

Although earlier the inflation account of hyperbole was described to explain how a speaker typically uses hyperbole to indicate they find some magnitude unexpected (or undesirable or not preferred), it didn't say anything about what actual magnitude might form in the head of a hearer of the hyperbole. It appears though that this fairly typical effect from memory research could have just such an impact and could accordingly affect how we should think about hyperbole and its comprehension products.[3]

***Contrast and Assimilation Effects*—**Contrast effects were invoked earlier in discussing how they have been used to explain sarcasm comprehension. Here, they, along with a related set of effects known as assimilation, will be considered for hyperbole comprehension. To illustrate, consider another classic memory task showing these effects. Three groups of people are given some bit of objective information. For example, they view a short film depicting an old, rusty car approaching the camera and then stopping. A driver turns off the engine, gets out of the car (the door's hinges can be heard to groan loudly). He then grabs the car door with both hands and in a full-bodied vigorous motion, slams the door shut. The driver then walks away and the film ends.

Each group of people is then asked later to recall this film. They are also asked to rate some things as indications of their representation of the events shown in the film. But before doing this recall and rating task, the groups must first do some intervening work. Group one, the control, is asked to do a simple, unrelated task designed to just occupy them for a short time. Group two, the *assimilation* group, is asked to consider a short list of well-known fictional and historical characters who all share the characteristic of *slight* dangerousness, aggression, meanness, or violence. What

is specifically done for this consideration is not of great importance, so long as the people in that group consider those characters for a period of time and attend to the characters' shared trait of slight agressiveness. Group three, the *contrast* group, does a similar thing to the assimilation group, except the characters given for consideration to the contrast group are well-known for being *extremely* dangerous, aggressive, violent, mean, or murderous.

In the end, all groups are asked to recall the film and to rate some characteristics of the driver person depicted in the film. Of particular interest is the result of a rating the participants are asked to make of how violent they think the driver person is, who, again, is shown slamming his car door. The control group typically provides an average rating around the middle of the scale, which usually ranges from, "not at all violent" to "extremely violent", or something similar. Relative to the average of the control group, the assimilation group usually deliver an average rating slightly nearer the "extremely violent" end of the scale. The average rating of the contrast group, though, is typically nearer the "not at all violent" end of the scale relative to the control group, with a usually greater magnitude of difference from the control group's average rating compared to the difference between the assimilation and control groups.

The explanations for these differences correspond to the mechanisms of assimilation and contrast. For the participants in the control group, *some* might view the door-slamming as indicative of a violent personality, where others may see it as a necessity of an old car whose doors don't easily latch, resulting in an average rating near the middle. Nothing else seems to pull or push their ratings in some direction. But for the assimilation group, exposure to the slightly violent characters serves to activate the concept of slightly aggressive behavior, which is still active when the participants consider the film driver person's personality in the recall task (Herr 1986; Smith & Branscombe 1988; Ford, Stangor, & Duan 1994). This results in that person's behavior being interpreted as stemming from a slightly aggressive personality, rather than from some situational necessity (e.g., stiff hinges), given the heightened availability of the concept of slight aggression. And, for the contrast group, a similar activation of a violence concept occurs, but for this group since the activated concept is much more extreme due to the nature of the characters they had to consider, the violence of the film driver person actually pales in comparison. Relative to the violence of Adolf Hitler, Vlad the Impaler, Jack the Ripper, or other violent mass murderers, the film driver person indeed seems much less violent in contrast and is rated accordingly.

Of course magnitudes of difference between the activated concepts in the biasing contexts (the consideration of slightly or extremely violent characters) and the target judgment (how aggressive is the driver person in the film) will affect whether assimilation, contrast, or no biasing effects occur. And also the range and type of considerations being made (personality characteristics, physical characteristics, perceptual judgments, etc.) and the degree of juxtaposition of the biasing and target items are crucial. But the overall general pattern holds in a great number of different areas of this form of judgment—biasing information differing slightly from a target characteristic will typically pull judgment in the direction of the biasing information. Biasing information differing more drastically from a target characteristic will typically push judgment away from the biasing information—assimilation and contrast.

Applied to hyperbole, again as with anchoring effects, the typical pattern of contrast or assimilation effects would also likely hold. So if a speaker slightly exaggerates or greatly exaggerates the magnitude of something, people's resulting perception of and then encoded new memory of that referent something, might be altered accordingly, relative to no hyperbole having been used. So different levels of hyperbole can promote people's resulting conceptualizations of the things being described (i.e., change their comprehension).

***Primacy and Recency Effects*—**Next, consider another well-known effect in human memory showing that, all else being equal, memory for material encountered at the very beginning or very end of some encountered sequence or timeframe, will be better relative to material encountered somewhere in the middle (Murdoch 1962). If a person reads a long list of city names for instance,

memory for those names at some time later will be best for the cities read at the start of the list (the primacy effect) and at the end (the recency effect).

If we think about these effects in light of, say, metaphor comprehension, we can also see a potential influence. Consider a husband/wife couple living in a suburban area of the desert in the southwest of the United States (e.g., Arizona). Consider also that their neighborhood had been experiencing a wave of solicitors recently—people attempting to sell dubious internet service plans and other suspect services. One day, as the woman passes by their front door, the man comes in from outdoors, closing the door quickly behind him because the house is air-conditioned. The woman asks him what he was doing outside and he says, "Oh there was a snake out there I had to get rid of". How would the woman interpret this comment? It could readily be taken as either a metaphor—derisively labeling an unscrupulous and unwanted salesperson as a "snake". Or the man could have non-figuratively been referring to a rattlesnake, a not uncommonly found animal in this location.

Primacy and recency effects could clearly influence the woman's interpretation. Had she recently, for instance, encountered mention of, or contemplated, the annoying salespeople, she would likely more readily recall *salespeople* upon hearing her husband's utterance and take the "snake" as referring to them metaphorically. Had she not recently, again for instance, been thinking about salespeople, recall fluency for that concept would be lower, raising the likelihood of her thinking of *rattlesnake* instead, as a non-figurative referent for the man's remark.

The point for present purposes is the likelihood of recalling any bit of knowledge or some previous experience is not something that only varies as a function of its raw, overall frequency—that bit of influence we already know about and readily incorporate into our language production, comprehension, etc., accounts, figurative and otherwise. But recall likelihood also ebbs and flows more dynamically as a function of primacy, recency, and a number of other more fluid tendencies in our memory functioning—effects which don't typically get woven into explanatory accounts in cognitive linguistics.

Congruency and Memory—Yet another classic domain of memory has shown that, all else being equal, memory will be better if recall is done under the same physical, emotional, and other relevant contexts in which the information was originally encoded in memory. If the study and recall contexts differ, though, then memory will suffer accordingly.

This effect clearly could affect figurative language comprehension. For example, again consider metaphor. Imagine a man heard his daughter complain about a friend of hers being a "bumblebee"—annoyingly always noisily buzzing around, metaphorically trying to nose into everyone else's private business. Imagine the man also heard the daughter use this metaphor repeated times, while sitting at his kitchen table drinking coffee. Should this man later hear another speaker, or even his daughter, use the term "bumblebee" while he is sitting at his table drinking coffee, and especially if the usage is ambiguous (i.e., could be taken metaphorically or non-figuratively, similar to the description above for the man mentioning a "snake" outside his front door), he might be more likely to take the metaphorical interpretation purely due to the momentum of memory congruency. So again, what we recall is influenced by the changing alignments of relevant contexts around us, which can work its way into and influence how we comprehend (produce, etc.), figurative language.

Memory and Embodiment—Human memory has also traditionally been viewed as a general cognitive capacity that, although having its sets of shortcomings, is nonetheless a fairly encapsulated ability of the mind that operates as it does independently of other physiological or biological processes. The content of what is being remembered itself is of little importance because it can all be reduced to bits of information that are encoded, stored, retrieved (or not), etc., from an all-purpose human memory system.

It turns out that this view, although in limited contexts can be reliable, as an overall explanation of memory is an oversimplification. Human memory in a broad sense, is much more like other

bio-cognitive processes in that it is shaped through evolution to service the needs of the gene, individual, and social group. It will thus operate differently according to certain characteristics about what is being remembered and what those memories are for. Space limitations prevent a full outline of this idea, but it turns out that different kinds of memory systems may serve different needs, and thus operate more and less accurately depending upon the content and consequences of what is being recalled.

As a consequence for figurative language comprehension, production, etc., recall of relevant mutually shared information which could affect that comprehension, etc., might thus be much better with people in whom we have some kind of interest (e.g., sexual, social, etc.) compared to other people we find less important, even if the level of encoding of that information between the pairs of people started out equivalent.

Summary—The effects treated here are by no means an exhaustive list of memory phenomena which could potentially influence figurative language use and comprehension. Among multiple other memory phenomena, which space limitations prevent full discussion of here, are: familiarity, distinctiveness, intentional versus incidental encoding, proactive and retroactive interference, levels of processing, priming, context effects, a wide variety of serial position effects, read versus generate recall differences, blocking, and decay and interference models of forgetting. A full account of figurative language cognition will ultimately require a thorough consideration of all of these.

The effects and examples that are included here, though, also nicely demonstrate what has already been well established by memory research—that human memory is highly malleable, dynamic, vulnerable to pre- and post-event information, schematically structured, variable according to motivation and content, and overall, demonstrably unreliable. All of this variability can impact figurative language cognition.

Cognition Is Not an Island—The idea of the cognitive commitment was a watershed moment in the history of linguistics as a discipline. It aligned linguistic accounts with the inner workings of the people in whom that linguistic functioning operates, at least cognitively. But cognition is not an island. It interacts with all the other important arenas of human functioning in complex, intimate, and intricate ways. I and others have accordingly called for a further embracement of all of those other areas, resulting in the need for a *sensory commitment*, an *emotional commitment*, a *personality commitment*, a *physiological commitment*, a *motivational commitment*, a *cultural commitment*, and perhaps most especially, a *social commitment*. We need our accounts from linguistics to align how people do language, with how people sense, feel, their personalities, their physiological functioning, their drives and motivations, the cultures in which they reside, and their drives toward, and abilities concerning, interacting with other people.

4. Current Contributions and Research

A number of new developments in cognitive linguistics applied to figurative language are ongoing. For space limitations only one will be briefly rementioned, that of the role of embodied simulations in figurative language production, comprehension, etc. On this view, language's evolution is seen as having usurped other, older areas of neural functioning, to enable a much greater interconnection between people. As much of our internal functioning with respect to sensation and action is similar, these neural areas provide a means of getting two separate nervous systems to resonate similarly. As such, they provide a powerful core of meaning-making material, which of course is honed and filtered through our different cultural and other frameworks.

5. Main Research Methods

Linguistics having embraced cognitive psychology/science was a wonderfully fruitful outcome methodologically. Many of the older empirical techniques from linguistics (e.g., corpus studies; documentation, transcription, and other recordings of authentic language; elicitation, and many

others) could be matched with more behavioral, observational, and experimental methodologies, for use in both controlled and naturalistic settings.

6. Recommendations for Practice

A very large literature on the use of figurative language for persuasive purposes as well as in therapeutic practice might be greatly affected by a more thorough incorporation of the full range of cognitive phenomena in our accounts of figurative language. These areas of practice regarding figurative language would also likely be changed were the cognitive commitment expanded to the other areas of human functioning advocated above.

7. Future Directions

One reason the "social commitment" was the most strongly advocated expansion of the cognitive commitment, mentioned above, stems from new findings in cognitive-social neuroscience detailing the extreme pressures humans experience for building and maintaining social connection and status. More than has been typically realized in our accounts dealing with the social component of language, figurative and otherwise, people are neurologically compelled to achieve social connection and status, and to build a sense of self that is socially oriented (Lieberman 2013). Considerations of the ramifications of these social drives for the functions of figurative language might lead to important new ways to think about why we have the range of figures we have and why they do what they do (see Colston 2019 for a review).

Notes

1 Interestingly, a comparison with hyperbolic utterances from a group of children (mean age, 7.39 years, range 2.5 to 10 years) revealed almost no differences across these variables (Colston 2007).
2 Obtained December 26, 2019, from internet source: www.distancefromto.net.
3 People typically use hyperbole to point out that magnitudes differ from preferences/desires/expectations in emotionally negative directions. The example story here concerning snow at a ski resort might reflect the rarer case of hyperbole being used to *celebrate* magnitudes turning out unexpectedly.

Further Reading

For works supporting the need for a "social commitment", by cognitive linguistics pertaining to figurative language, see Colston 2015, 2019; Lieberman 2013; Dunbar 1996; Williams 2001. For works suggesting the need for a "developmental commitment", see Colston, 2019.

Related Topics

For space reasons, the present chapter only dealt with treatments of figurative language under the umbrella of cognitive linguistics, stemming predominantly from its adoption of the cognitive commitment discussed at the chapter's beginning. But other treatments of figurative language, predominantly, and perhaps obviously, in writing, can be found in cognitive poetics, a branch of literary theory dealing with literary texts where figurative language and other poetic and stylistic tools are also used. This approach also adheres in part to the cognitive commitment, and conceptual metaphor in particular is an oft-used analytic tool, along with conceptual metonymy.

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25

QUALIFYING CONCEPTUALIZATIONS

Jan Nuyts

1. Introduction

This chapter addresses an issue which lies at the crossroads of cognitive linguistics and traditional (typological-)functional linguistics.[1] It concerns an aspect of how we humans conceptualize the world around us. More specifically, it deals with the question how we anchor information about states of affairs we learn about (through perception, or through reasoning, or from hearsay) in our long-term store of knowledge about the world. We do so along a range of dimensions which serve to specify, to situate, and to assess the status of, the state of affairs at stake, and which may be covered under the label 'qualifications of states of affairs'. These dimensions show an intricate hierarchical organization, which is reflected in how they behave in linguistic expression, and which instantiates a number of basic principles of perception and understanding. In line with its central role in conceptualization, this qualificational hierarchy is also an essential factor in the process of (inter)subjectification, as a major mechanism of semantic change in the diachrony of language.

This chapter is organized as follows. Section 2 situates the issue of the qualification of states of affairs in the cognitive linguistic and functional linguistic traditions. Section 3 offers an overview of the most important qualificational dimensions, explains the hierarchical relations between them and how these are reflected in linguistic expression, and ventures into the conceptual principles behind the hierarchical system. Section 4 discusses the import of the hierarchy for understanding the mechanism of (inter)subjectification in semantic change. Section 5 formulates some conclusions.

2. Qualifications in Cognitive and Functional Linguistics

In cognitive linguistics, the issue of the anchoring of information about states of affairs in one's world knowledge is most prominently present in, and most elaborately investigated in the context of, the concept of 'grounding', as a central element in the analysis of conceptualization in Cognitive Grammar (Langacker 1987: 126–129, 2002, 2008: 296–309; see Chapter 2 in this volume for detailed discussion and references).

The notion of grounding is wider, and at the same time narrower, than the concept of the qualification of states of affairs, however. It is wider in the sense that it covers everything to do with 'deixis', in a broad definition of that notion.[2] This also includes, for instance, reference in the

nominal domain (issues such as definiteness of noun phrases, pronominals, demonstratives, etc.), a matter which is not at stake at all in the issue of qualifying states of affairs.

But 'grounding' is narrower in the sense that it only covers part of the domain of qualificational categories. It only involves the parts of it that in Langacker's perspective would be considered 'epistemic', in a broad sense. This does include epistemic modality in a narrow sense (i.e., the estimation of likelihood), or situation in time, but not (or not clearly so) dimensions such as phasal aspect, quantitative or frequency aspect, or maybe even deontic modality (see section 3 for definitions of all these notions).[3] And it is also narrower in the sense that, in the linguistic domain, it only covers (the meaning structure of) highly grammaticalized expressions of the categories at stake (such as strongly grammaticalized auxiliaries and morphological markers). The issue in focus in this chapter concerns the conceptual role/status of the semantic dimensions involved per se, irrespective of how they are coded linguistically, however. Hence the meaning profile of any type of linguistic device that can be used to express them is relevant, including that of adverbial, adjectival, or verbal forms (among others). (See also Nuyts 2002 on the correspondences and divergences between the notion of grounding and the present concept of qualifying conceptualizations.)

In other strands within cognitive linguistics, however, qualificational dimensions have not received much attention. Even in a cognitive semantic perspective, in spite of the focus on conceptualization, there has hardly been concern with them (there have been a few attempts to analyze the modal meanings in terms of Talmy's notion of force dynamics, see Talmy 1988, 2000: ch. 7; Sweetser 1990). Also in the different versions of Construction Grammar, studies dealing with the issue are rare. Moreover, to the extent that it has been addressed in the latter, the focus has been on the question how to represent qualificational expressions in a constructionist framework, rather than on the question of the conceptual status of the qualificational dimensions as such (see, e.g., Cappelle & Depraetere 2016 on modal expressions, in particular the auxiliaries, or Michaelis 1998 on aspect and time). (More general overviews of the treatment of qualificational dimensions in different types of cognitive linguistic approaches are offered in Mortelmans 2007 and Boogaart & Fortuin 2016 on modality, and in Boogaart & Janssen 2007 on tense and aspect.)

In functional linguistics, especially in the typologically oriented branches of it, on the other hand, the study of linguistic expressions qualifying predications or propositions has for many years been, and continues to be, a major issue (in these strands the phenomena at stake are often covered under the label 'tense-aspect-mood/modality' or 'TAM' marking; see, e.g., Hopper 1982, Bybee et al. 1994, Bybee & Fleischman 1995, Dahl 2000, Givón 2001: 285–367, Binnick 2012, Nuyts & van der Auwera 2016, to mention just a few of the numerous overview studies and collective volumes dealing with the system or major parts of it; there are also numerous monographs analyzing the TMA system in individual languages from across the globe).[4] The focus in these studies has been nearly exclusively on the linguistic behavior of qualificational expressions, however. Even when dealing with the semantics, the main concern has been to account (on a functional, meaning-driven, basis) for the grammatical properties of linguistic devices expressing them. Concern with their conceptual role has by and large been absent, even in the context of the frameworks (including grammar models) aiming to offer a more systematic account of the behavior of TAM systems (see section 3). Moreover, like in the grounding literature, there has been a strong bias towards grammatical(ized) expressions, although non-grammatical ones have also received some attention.

(Inter)subjectification, as a mechanism of diachronic meaning change, relates closely to the issue of the qualification of states of affairs, in the sense that qualificational dimensions such as the modal ones play a central role in it (or at least in subjectification, as one part of the process; see section 4). Originally introduced by Traugott (1989, 2010; Traugott & Dasher 2002), this concept has acquired a very central position in the diachronic literature of the past few decades (along with

the concept of grammaticalization; Hopper & Traugott 2003). (Cf., e.g., Athanasiadou et al. 2006; López-Couso 2010; Davidse et al. 2010. See Chapter 19 in this volume, on (inter)subjectivity and (inter)subjectification, for further details.)[5]

3. The Qualificational Hierarchy and Its Cognitive Status

Let's first look at the linguistic facts relevant for the analysis of the issue of qualifying states of affairs (section 3.1), before we turn to its cognitive status (section 3.2).

3.1 Qualificational Dimensions and Their Hierarchical Relations

Linguistic utterances in principle always contain two types of semantic material. On the one hand, parts of a clause serve to designate the state of affairs in (the speaker's conceptualization of) the world which (s)he wants to communicate. This normally involves the main predicate, coding the event type, and the nominal groups figuring as its arguments, coding the participants in the event. In the example in (1), the constituents in boldface are responsible for expressing the state of affairs to be communicated.

(1) **I** *will probably have to* **get a new car** *before long*.

On the other hand, a clause contains elements serving to specify, situate, and/or assess the state of affairs at stake, along a range of dimensions. These qualifications of the state of affairs are typically expressed by adverbials and/or grammatical markers on the predicate. In (1), the linguistic material serving this purpose is italicized: *will* and *before long* specify the temporal situation of the state of affairs; *have to* marks that 'I' is forced by circumstances to perform the state of affairs (e.g., because her/his old car is breaking down; dynamic modality); and *probably* marks that it is not certain yet that 'I' will be forced to buy a new car soon, but that it is only likely (epistemic modality).[6]

There are several other qualificational dimensions next to those illustrated in the example in (1). Yet the typological research mentioned in section 2 indicates that the inventory of these categories is limited and fixed. The set moreover appears to be universal, in the sense that all languages somehow offer means to express all categories in it. There are huge differences between languages, though, in terms of how prominent the different dimensions are (as reflected, for instance, in how much semantic fine-graining within the category can be expressed in the language), in how the language organizes the categories internally and which sub-dimensions it profiles (cf., e.g., the existence of very different systems of spatial reference in the languages of the world, as analyzed in Levinson 2003), and in how the language expresses the categories (e.g., the choice for grammatical vs. lexical means, and for different types of them).

Here is a brief (non-exhaustive) overview of the most important of these dimensions (all illustrated with English examples, the relevant forms in them are in italics):[7]

Phasal aspect marks the stage of deployment of the state of affairs: is it completed (perfective) or not (imperfective), is it about to begin (prospective), is it starting (inchoative/ingressive), is it ongoing (progressive, continuitive), is it ending (egressive), etc.—cf. (2).[8]

(2) a. I *am* think*ing* of buying a new car. [progressive]
b. I *am about to* buy a new car. [prospective]

Quantitative aspect (or frequency aspect) indicates how often the state of affairs occurs in the world: just once (semelfactive), repeatedly (iterative), as a 'habit' (habitual), in a lawlike manner (generic), etc.—cf. (3).

(3) a. I *usually* buy a used car. [habitual]
b. I *only* buy diesels. [generic]

Space involves the situation of the state of affairs in three-dimensional space—cf. (4).

(4) When I was living *in California* I was driving a huge Ford T-Bird make 1977.

Time involves the situation of the state of affairs on the time axis—cf. (5) (or (1) above).

(5) *When I was living in California* I *was* driving a huge Ford T-Bird make 1977.

Modality is a term used in the literature to cover a series of quite different categories (see Nuyts 2006, 2016, for more extensive discussion). The three most important traditional ones are:

Dynamic modality, indicating abilities/possibilities or needs/necessities of/for the first argument participant in the state of affairs (inherent in the participant, or imposed on him/her by circumstances), or potentials or inevitabilities inherent in a state of affairs as a whole (situational)—cf. (6) (or (1) above, in which *have to* expresses participant-imposed necessity).

(6) A diesel *can* be quite clean you know, if you buy a recent model. [situational potential]

Deontic modality, marking an assessment of the degree of moral acceptability or desirability of the state of affairs—cf. (7).[9]

(7) You *shouldn't* buy an old diesel anymore, they're far too polluting.

Epistemic modality, marking the degree of likelihood of the state of affairs—cf. (8) (or (1) above).

(8) I *may* have to buy a new car this time, if I want a clean diesel.

Evidentiality, finally, involves the coding of the source for the information about the state of affairs: has it been perceived directly (experienced), or has it been inferred indirectly from other known or observed facts (inferential), or has it been acquired through communication (hearsay)?—cf. (9).[10]

(9) It *seems* I'll have to buy a new car soon. [inferential]

A significant property of this set of dimensions is that it does not merely involve an unstructured list. It is an organized set, with the categories in it showing a hierarchical order. This order correlates with the relative extension of semantic scope of each of the categories, as it can be observed if one combines them in a clause. This was already illustrated in the discussion of (1) earlier in this section: 'I' will be forced to buy a new car in the future, but the future is not forced in any way (i.e., the future markers affect/have scope over the dynamic modality marker but not vice versa); and the probability concerns 'I' being forced to buy a new car in the future, but the judgment of likelihood is not situated in the future (or forced), it is valid at speech time (i.e., the epistemic marker affects/has scope over the time and dynamic modality markers, but not vice versa). (10) offers two more examples.

(10) a. John *apparently* tri*ed* to call me *several times last week*.
b. *Regrettably*, he *started* smoking *again*.

In (10a), the inference expressed by *apparently* concerns 'him calling me several times last week', i.e., the state of affairs as well as its frequency (expressed by the iterativity marker *several times*) and temporal situation (*last week*). But neither of the latter has any effect on the evidential form: the inference is not situated last week, nor is it made several times, it is applicable at the moment of speech, and it is singular. And *last week* temporally situates 'him calling me several times', hence also affects the frequency marker, but the latter does not affect the time marker (there is just one 'last week'). And so one can perfectly say that 'it is apparently the case that he tried to call me several times last week', or that 'it was (apparently) the case last week that he tried to call me several times', but turning these around each time produces a nonsensical statement—cf., e.g., **it is several times the case that he apparently called me last week*. Hence inferential evidentiality has semantic scope over time and quantitative aspect, but not vice versa; and time has semantic scope over quantitative aspect, but not vice versa.

It will not be difficult to construe, in a similar fashion, the relationship in (10b) between the deontic modal marker *regrettably*, the repetitivity/iterativity marker *again*, the ingressive marker *start*, and the past tense marker affixed on the latter. The moral judgment concerns the fact that 'he started to smoke again', including the quantitative and phasal aspect and the time indications, but the latter do not affect the deontic judgment. The tense form situates 'him starting to smoke again', including the two aspectual qualifications, in the past, but neither of these aspect markers affects the time marking. And the repetitive (quantitative) aspect marker concerns 'him starting to smoke', but the ingressive (phasal) aspect marker does not affect the quantitative aspect marker. And so deontic modality has scope over time, time has scope over quantitative aspect, and quantitative aspect has scope over phasal aspect, but vice versa does not apply in any of these cases.

Comparable observations apply to all other combinations of qualificational categories. And the observed semantic scope relationships are (in principle) stable, both across usage events within any language, and across languages (i.e., they are universal, like the categories as such).[11]

These semantic scope distinctions are also reflected linguistically, among others in the surface order of the markers expressing the different qualificational categories. In languages primarily using (chains of) affixes on the verb, for instance, markers of categories with a narrower scope will typically appear closer to the verb stem, those with a wider scope further away from the stem (i.e., the affix order iconically renders the semantic scope). Something similar applies within the range of adverbial expressions (cf., e.g., Van Valin 2005: 19ff), even if the situation is much more complicated there due to the interference of other functional dimensions determining word order (such as informational salience).

On the basis of all these observations, then, one can order the different qualificational categories in a semantic hierarchy of layers, like in an onion, with the qualified state of affairs at the center and the qualificational dimensions constituting successive shells around it and each other, according to their increasing width of scope. This concept of the hierarchical or layered representation of qualificational dimensions figures centrally in several frameworks within functional and typological linguistics, albeit in sometimes substantially different versions (the concept is assumed, e.g., in Role and Reference Grammar—Foley & Van Valin 1984, Van Valin & LaPolla 1997; in Functional (Discourse) Grammar—Dik 1997, Hengeveld & Mackenzie 2008; in the Saint Petersburg School—Malchukov 2011; and cf. also, e.g., Bybee 1985, Nuyts 2001, Narrog 2009).[12] A fairly theory-neutral (and tentative) version of the hierarchy is rendered in (11).[13] Higher up in the scheme means wider semantic scope, hence categories do have scope over those below them but not over those above them. (The subdivisions marked by the horizontal lines will be explained in section 3.2 below.)

(11) > inferential evidentiality
> epistemic modality
> deontic modality [assessing]

> time
> space
> quantitative aspect/dynamic modality [situating]

> phasal aspect [specifying]

> STATE OF AFFAIRS

3.2 The Cognitive Import of the Qualificational Hierarchy: Anchoring Information in World Knowledge

As is signaled by the strong presence of qualificational expressions in more or less all language use, and by the universality of the qualificational dimensions and their hierarchical organization in the languages of the world, the matter of qualifying states of affairs is not just a linguistic phenomenon. As argued in Nuyts (2001, 2009), it constitutes a very basic dimension of the human cognitive system for conceptualizing the world—and the linguistic effects in terms of semantic scope and word order are merely a superficial reflection or emanation of this.[14]

In this context, first observe that the individual qualificational dimensions, as listed in section 3.1, are far more than just linguistic notions: they all constitute very fundamental elements of the way humans interact with the world in general. For one example, consider epistemic modality. Estimating the probability of states of affairs plays a role in all problem solving and decision making, at all levels of complexity, and it is critical for our ability to function adequately in our environment (and ultimately, for our survival). Even in a very simple matter such as crossing a street, before acting we need to judge the chances that we can reach the other side before vehicles reach us. Or, in a complex matter, when a head of state decides to take hostile actions towards another state, (s)he has to judge the chances that (s)he will succeed and that the own state will profit from it. Or consider time or space, for two other very obvious examples. Our understanding of and acting in the world crucially depends on our ability to estimate temporal and spatial relations, between states of affairs, and between them and the *hic et nunc* of our consciousness, at all levels of complexity. We need them to coordinate individual actions in executing basic tasks such as walking, writing, doing the dishes, etc., and we need them to organize complex enterprises such as building a house or running a company. Something similar applies to all other qualificational dimensions: moral judgments, for instance, pervade all our decisions and actions in life (cf. deontic modality), and realizing that you are facing a new, unknown, situation vs. are in a situation similar to ones you havve encountered repeatedly before (cf. quantitative aspect) potentially makes a huge difference in how you behave.

Not surprisingly, then, there also appears to be a very fundamental cognitive rationale behind the hierarchical organization of these categories as rendered in (11). This hierarchy reflects a few very basic principles of human perception and conceptualization. In abstract terms, at least the following, strongly interwoven, dimensions appear to be at work (these will be illustrated for a few of the qualificational dimensions further below):

- Climbing up the hierarchy involves a gradual widening of the perspective on the state of affairs: qualifications at the bottom offer additional specifications, in concrete terms, of the internal constitution of the state of affairs; qualifications in the middle situate the state of affairs as a whole in the world; qualifications at the top involve abstract characterizations of the status

of the state of affairs in the language user's knowledge of the world. This is what is rendered in the scheme in (11) by the subdivision in groups of categories, separated by horizontal dotted lines, and labeled 'specifying', 'situating', and 'assessing'.

- Correspondingly, climbing up the hierarchy involves an increasing role for knowledge beyond the state of affairs: qualifications low in the system require (hardly) anything beyond the concept of the state of affairs as such, those high up in the system are exclusively based on information external to the state of affairs proper.
- Also in line with the preceding, the hierarchy reflects the tension between perception and singularity vs. interpretation and generalization: climbing up involves a decreasing role for the percept of a (singular) state of affairs to be qualified (as a token), and an increasing role for interpretation of and generalization over the state of affairs (in terms of types), by means of reasoning by the conceptualizer on the basis of increasingly abstract and general principles.
- And as such, climbing up also involves an increasing role for the speaker/conceptualizer. The preceding items imply that the higher up in the hierarchy, the more (s)he has to do to perform the qualification, in terms of drawing in information beyond the state of affairs of concern and in interpreting the situation of the latter in that light. In sloganesque terms: 'the higher up, the more conceptual work'. But this also means: the more room for creative involvement on his/her part in coming to the qualification of the state of affairs. In other words: the higher up, the higher the degree of 'subjectivity' (in one particular sense of the notion—see section 4) of the qualification.

To make this more concrete, consider what a conceptualizer needs to do in order to determine the 'values' for a few of the dimensions in the system:

- Determining the state of deployment of a state of affairs (phasal aspect) involves specifying an aspect of its internal constitution. Doing so only requires the percept of the state of affairs (or a representation of it in memory), as a token. No generalizations involved, no information beyond the state of affairs needed. And there is not much room for interpretation on the part of the conceptualizer.
- Determining the frequency of occurrence of a state of affairs (quantitative aspect) requires the (memory of) percepts of several tokens of states of affairs and the detection of similarities and dissimilarities between them, in order to determine whether it is unique, or whether it can be included in a type along with other tokens which are sufficiently similar, and which can then be quantified. This obviously leaves some room for interpretation: when does a token fit a type? Still, little information is required beyond the representation in memory of (the different percepts of) the relevant state of affairs.
- Situating a state of affairs in time requires assessing its position vis-à-vis a more complex set of other facts about the world, viz. the patterns and subpatterns in the cycles of the sun and the moon (which, due to their complex systematicity, are subject to conventionalized generalizations in terms of the clock and of calendars). And it often also involves determining its position in these terms relative to that of other states of affairs: temporal situation of an event can be relative to the *hic et nunc* of the speaker/conceptualizer, but very often it is (also) relative to other events. There is a fair amount of flexibility in how a conceptualizer can handle this.
- Assessing a state of affairs epistemically, however, does not involve any perception of it anymore (a directly perceived state of affairs requires no epistemic judgment, assessing likelihood is only relevant for a hypothetical state of affairs). It is purely a matter of relating and comparing other, relevant, pieces of information about the world—concrete percepts, as well as abstract generalizations concerning how the world 'works'—in order to achieve an estimation of the likelihood of a postulated state of affairs. This process is much less (if at all) based on conventionalized patterns than situation in time (cf. the clock, calendars), because there is much more variability in the kinds of information that can play a role in this reasoning process (in

principle, the variation is endless). Correspondingly there is even more room for interpretation on the part of the conceptualizer.

In sum, the qualificational dimensions, and the hierarchical system in them, are no doubt essential parts of human conceptualization. In fact, they may be taken to be key elements for the organization of our general long-term store of world knowledge, and they are crucial for anchoring newly acquired information in it. In Chafe's (1994: 129) words, "consciousness cannot function without being oriented in space, time, society, and ongoing background events". One may assume, then, that a state of affairs cannot acquire a stable position in world knowledge unless it is characterized in terms of the full system in (11), with a 'value' specified for all dimensions in it.[15] In actual speech speakers normally only specify values for one or a few qualificational categories pertaining to a specific state of affairs in one clause (in an example like (10b) there are four of them, but that is beyond average), or even in a full discourse. But that limitation is due to communicative dynamics: one only mentions what happens to be relevant in the actual discursive context.[16] And it is significant: everyday communication is no doubt aimed not only at learning about new states of affairs in the world as such, but to a considerable extent also at resolving issues with the status of (newly acquired or already known) states of affairs in view of their anchoring in the interlocutors' knowledge.

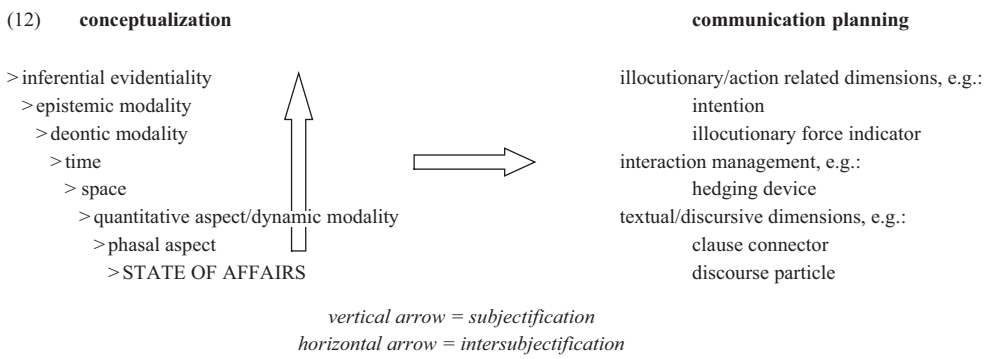
Better understanding how this works and what it implies will be a promising field of scientific inquiry in the years to come.

4. The Qualificational Hierarchy and (Inter)Subjectification

The importance of the qualificational hierarchy as a basic dimension of conceptualization is also underscored by the fact that it plays a central role in semantic change in language. In particular, it is arguably the driving element for the mechanism of change called subjectification (as part of the complex process of (inter)subjectification), as first defined by Traugott (1989) and modified and elaborated in her later work (Traugott 2010; Traugott & Dasher 2002). By the notion of subjectification, Traugott and colleagues refer to the observation that linguistic forms (most typically, but far from exclusively, grammaticalizing ones) often show a strong tendency to evolve from meanings pertaining to the description of the objective world (in a broad sense, i.e., objects and states of affairs in the world), to meanings pertaining to the speaker's personal position vis-a-vis that objective world, i.e., meanings that "encode and regulate attitudes and beliefs" (Traugott 2010: 35). Traugott (1989) explicitly refers to epistemic modality as a typical case of a strongly subjectified meaning.

Traugott defines the notion of subjectification in very general terms, and does not refer to the qualificational hierarchy for it. Yet there are several elements indicating that there is a direct link between the two notions (see also Nuyts 2012; Byloo & Nuyts 2014; Nuyts & Byloo 2015). The opposition between objective meanings pertaining to the description of the world and subjective meanings pertaining to the speaker's position towards that world corresponds to that between the level of the state of affairs at the bottom of the hierarchy in (11) and the level of the assessing (or attitudinal) qualifications high up in the scheme. The notion of an increasing role for the speaker/conceptualizer, and a corresponding increase in subjectivity of the qualifications (in the sense of 'personal involvement'; see Nuyts 2012 on alternative notions of subjectivity), is a central part of the rationale behind the qualificational hierarchy, as explained in section 3.2. Moreover, one of the well-known paths of evolution in the domain of modal meanings (most notable in the modal verbs), generally considered a prototypical case of subjectification, is from dynamic to deontic and then further on to epistemic modality.[17] This order corresponds perfectly to the order (from low to high) of these categories in the hierarchy in (11). So it stands to reason to consider Traugott's notion of subjectification as a diachronic process by which the meaning of a linguistic element gradually climbs up in the hierarchy—as rendered in the left-hand part of the scheme in (12).[18]

(12)



As also indicated in the scheme in (12), in this perspective, intersubjectification—as a process following subjectification in Traugott's analysis—can be defined as a change whereby a form semantically or functionally leaves the qualificational hierarchy in order to assume a role in regulating the speaker's communicative interaction with the hearer, broadly defined. This includes dimensions of the kind indicated in the right-hand column in (12) (cf. Nuyts 2008). This matter thus taps into another important distinction to be made in a cognitive theory of language use, viz. that between conceptual and communicative dimensions of language use. Elements such as hedging and the use of politeness strategies, or the shaping of speech acts, have nothing to do with how we conceptualize the world, but are entirely about how we plan and execute communicative action concerning conceptualizations.

Irrespective of the latter issue, however, the fact that the qualificational hierarchy is also the central element in a major mechanism of semantic change in the diachronic evolution of languages underscores that we are dealing with a dimension which has an important role in the way we organize our conceptualization of the world.

5. Conclusion

There is a vast literature on the issue of the qualification of states of affairs in the functional and typological literature, which is, however, hardly concerned with the cognitive role of these dimensions. There is a vast cognitively oriented branch in linguistics which is actively involved in unveiling how language is rooted in the human mind, but which has spent relatively little attention on the domain of qualificational categories. There is strong evidence to assume, though, that this domain, as reflected in language use, pertains directly to a central aspect of how we humans conceptualize the world. Hence exploring this field further from a cognitive perspective may offer a substantial contribution to improving our—currently quite limited—understanding of human conceptualization and thought, and its relations to language use.

Notes

1 See Nuyts (2005a, 2007) on the relationships between these two strands.

2 This very wide notion of deixis is not necessarily generally accepted. For instance, it also covers epistemic modality (as a central component of grounding, see below), but it is far from obvious to call that category deictic.

3 Again, this use of the notion 'epistemic' is not uncontroversial. It is, for instance, unclear why situation in time is epistemic in the same way as epistemic modality in the narrow sense, but quantitative and frequency aspect, for instance, are not. (One might consider the notion to be equivalent to 'epistemological', but that term would typically be used in an even wider sense, to cover everything to do with knowledge.)

4 The matter has also received considerable attention in formal semantics and, to a lesser extent, in generative linguistics (e.g., Cinque 1999; Mani et al. 2005; Portner 2009). Since the present approach has strong ties with the functional linguistic tradition, formalist approaches will not be considered in the following.

5 Traugott's notion of (inter)subjectification would seem to have a direct counterpart in the concept of subjectification as defined by Langacker (1990) in the context of Cognitive Grammar. In spite of initial assumptions to the contrary (cf., e.g., Langacker 1990: 16), it has become clear that Traugott's and Langacker's notions address different issues (see, e.g., Langacker 1999: 393–394; Traugott & Dasher 2002: 97–99; Traugott 2003; López-Couso 2010: 145; Nuyts 2012). Langacker's notion will not be of further concern in this chapter, as it is not related to the issue of qualifying states of affairs.

6 The example illustrates that the term 'state of affairs' is somewhat unfortunate in that it implies a stative concept of what is conceptualized, while it is meant to also cover dynamic events. Alternative terms face the same problem, though: 'event', for instance, implies dynamicity, hence would seem to exclude stative states of affairs.

7 There is considerable dispute over matters such as the precise list of qualificational dimensions and the subcategories in them, their definition, and the delimitation between categories. The following list is a fairly neutral and selective overview, although it is biased by my own perspective on some issues, in particular in the range of the modal and evidential categories (see, e.g., Nuyts 2005b, 2017).

8 In (2a) only the grammatical form (*am* X*ing*) is at stake, not the verb itself.

9 The traditional definition of this category also, or even primarily, refers to the notions of obligation and permission. However, there are good arguments to consider the latter to be speech act categories (functionally equivalent to the imperative), not qualificational ones. See Nuyts et al. (2010) for analysis.

10 In spite of traditional views, evidentiality may not be a coherent notion, though, since the subcategories (experienced, hearsay, inferential) have quite distinct properties. See Nuyts (2017) for discussion.

11 There are a number of factors which complicate the picture at the linguistic surface, though, including the distinction between performative uses (rendering the speaker's qualification) vs. descriptive or reported uses (quoting others' qualification of the state of affairs; these behave differently in terms of their scopal properties). See Nuyts (2001).

12 The differences between proposals are partly due to the often quite different theoretical perspectives in these alternative frameworks. But to a considerable extent they also reflect that many aspects of the hierarchy and its linguistic effects are still insufficiently understood.

13 The hierarchy in (11) is also incomplete in that it only features the selection of qualificational dimensions introduced earlier in this section. Moreover, it makes abstraction from issues pertaining to the hierarchy in a more circumstantial way. For instance, among the evidential subcategories, it only features inferential, because the two other types (experience and hearsay) are not directly part of the hierarchy but, arguably, relate to it in a higher 'sphere' (see Nuyts 2017). Also note the very different position of the three traditional modal subcategories, underscoring that they are semantically very different notions: dynamic modality is much lower in the hierarchy than the two others, and is arguably related to or even part of quantitative aspect.

14 This statement should not be interpreted in a simplistic way, of course: this does not involve the assumption that something like the hierarchy in (11) is represented or stored in conceptualization in a literal way. It only involves the assumption that something corresponding to what is rendered by the hierarchy is present in human conceptualization, even if we have no idea at present what form this actually takes.

15 This formulation simplifies matters: what specifying a value involves and implies for anchoring the state of affairs may be quite different for the different qualificational dimensions. For the set of 'assessing' categories in the system in particular (see (11) above), the story is quite complicated. See Nuyts (2001, 2009) for elaboration.

16 In part it is also determined by the grammar of the language, though. Expressing qualificational categories in a linguistic utterance is usually optional (unlike expressing the state of affairs, which is in principle always necessary). Yet many languages make the presence of certain categories of qualificational markers (typically, if not always, grammatical/morphological ones) more or less compulsory in all clauses—even if they differ in terms of which category: for instance, in the Germanic and Romance languages this involves tense marking (as a coding of time, at least in principle); in the Slavic languages this rather involves aspect marking; in some Asian and Amerindian languages this concerns evidentiality marking. (Because of the near obligatoriness of such markers, it is no surprise that they may tend to express more qualificational meanings than what can be considered their default. Tense in the Germanic and Romance languages, for instance, can express many more dimensions than just time.)

17 It was originally assumed that this involves a linear evolution through these three meanings, but empirical research has shown that at least in some cases the evolution is rather, in a first phase, from dynamic to

deontic, and in a later phase, from dynamic to epistemic (i.e., without a development from deontic to epistemic). See Byloo & Nuyts (2014).

18 This does not mean developments are going through all steps in the hierarchy (which probably never happens), but only that meanings of a form show a general change from somewhere lower to somewhere higher in the hierarchy.

Further Reading

Further readings on the different items addressed in this chapter have been provided in the course of the above discussion. It is impossible to single out a handful of references which are more central than the others.

Related Topics

(inter)subjectivity and (inter)subjectification; grounding

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COGNITIVE PRAGMATICS

Marco Mazzone

1. Introduction

There is a variety of definitions of pragmatics, and it is fair to say that they do not completely overlap with each other. As a matter of fact, some of them explicitly suggest it is hard to provide a theoretically coherent definition of the field: for one famous example, Bar-Hillel (1971) spoke of the "pragmatic wastebasket" and invited scholars to "bring some order" into its contents before attempting to force bits and pieces of it "into your favorite syntactico-semantic theory" (Bar-Hillel 1971: 405). Even the two foundational theories in the field, those put forth by Paul Grice and John Austin, can be seen as shedding light on quite different phenomena (unless they are theoretically incompatible descriptions of the same phenomena: more on this below). In short, there seems to be a problem as to the unity of the field. To be sure, it is largely accepted that pragmatics concerns the use of language in context, but what is much less clear is whether this coarse definition is amenable to a single explanatory mechanism, or it is just a label for a relatively accidental collection of facts.

What happens if we specifically focus on the *cognitive* approach to pragmatics, that is, if the explanatory mechanisms we aim to discover are the psychological processes involved? This focus is relatively recent, since the discipline has its roots in philosophy and linguistics: as a consequence, it has largely focused on the normative grounds for language use in context—be they conceived in terms of cooperative rationality as in Grice, of social conventions as in Austin, or in terms of the abstract system of language. Starting from the 1980s, however, there has been growing interest in the psychological processes that can be deemed responsible for the structures described at those normative levels: this is the proper domain of cognitive pragmatics. From this perspective, the previous issue of the unity of pragmatics can be framed as follows: is it possible to pick out one single process which is responsible for the entire range of pragmatic phenomena—and possibly only for them? A different way to put this issue, in the jargon of cognitive science, is: is there a *module* for pragmatic processing, that is, a psychological mechanism that is specialized for the use and understanding of language in context?

The answers to these questions have largely been affected by Grice's model. In spite of the fact that Grice had been trained as a traditional philosopher of language (not a cognitive scientist), he was able to establish the lines along which cognitive pragmatics has developed since. In particular, two ideas have had crucial and long-lasting effects on the discipline. The first is the *intentional* nature of human communication: specifically, the idea that the use of language on the part of the

speaker is instrumental to conveying her communicative intention (i.e., her intention to communicate something specific to the situation) and, reciprocally, what the addressee aims to is the recognition of such an intention. The second is the *inferential* (and in a sense, rational) nature of human communication, that is, the idea that both the speaker and the addressee are involved in a form of practical reasoning: the speaker has to find out which utterance is an appropriate means for the addressee to recover her communicative intention (in context), while the addressee has to travel the same path in the opposite direction—from the means (i.e., the utterance) to the communicative goal of the speaker. As a matter of fact, however, scholars in cognitive pragmatics have spent their efforts almost exclusively in the analysis of the latter process of *understanding*: how the addressee comes to identify the communicative intention of the speaker.

Over the last four decades, Grice's notions of inferential communication and communicative intention have been central to any attempt to specify a single cognitive mechanism for pragmatic processing: the relevant mechanism has been essentially described either as a form of intention recognition, or as a form of inferential reasoning, or both. By this, I do not mean that everyone conceives of pragmatic understanding as an inferential process of intention recognition. On the contrary, as we will see, it has been repeatedly claimed that pragmatic understanding is not (entirely or essentially) inferential and based on intention recognition. However, in those cases no special emphasis has been put on the claim of one single cognitive mechanism which is specific for pragmatic understanding.

In this chapter, I will provide a summary overview of cognitive pragmatics which is especially focused on the described issues. The resulting picture will be somewhat mixed. On the one hand, I am going to suggest that Grice's paradigm is actually central for cognitive research, and also that it is easily made coherent with approaches that have been considered instead as essentially different or even straightforwardly incompatible—such as the ones based on conventions and grammar. In other words, I defend the view that the cognitive mechanism for utterance understanding can be essentially described as a form of inference-based device for intention recognition, which includes the recognition of conventional patterns of behavior as a component. But on the other hand, I am finally going to suggest that high-level functional descriptions of cognitive processes are likely to be simplifications, in two different senses: first, they focus on what is coherent with their explanatory purposes at the expense of the internal differentiation of the field; and second, what is methodologically most relevant, the cognitive abilities described at this level emerge on low-level mechanisms whose functional organization grows in complexity in the course of individual development. This latter point has important consequences with regard to the cognitive architecture involved. Specifically, it may mean that there is no innate module specialized for utterance understanding. On the contrary, this ability is likely to be the result of a sociocultural development, which intertwines with the development of other abilities: specifically, I will consider reasoning (i.e., making inferences) and the ability to attribute intentions and other mental states (which is usually called "mindreading").

To summarize, in the view proposed here, cognitive pragmatics is the study of the processes which are responsible for human communication in context (especially on the side of the addressee); these processes can be described as a form of inference-based intention recognition; as such, they seem to have a developmental course which co-evolves with the development of both reasoning and mindreading abilities.

2. Historical Perspectives

2.1 Grice's Legacy

How central the notion of intention was in Grice's theory of (linguistic) comprehension is made clear already by a distinction drawn in his seminal paper 'Meaning' (Grice 1957): that is, the distinction between Natural and Non-natural meaning. He observes that in utterances like "Those

spots mean measles" and "Those three rings on the bell mean that the bus is full" the verb "mean" is used to convey quite different things. Now, a theory of comprehension is concerned only with the latter use, which implies an agentive notion of intention: something is a sign of something else not because of natural correlations, but because of an intentional attribution of meaning. Grice prefers not to characterize this feature in terms of conventionality, since in his view conventions are not required in order to have communication: provided that there is an intention to communicate, humans find their way to express it, while conventional meanings come only later if (and when) communicative uses get conventionalized.

Another important insight of Grice was that communicative intentions have a double and reflexive structure. The speaker usually has the intention to provide certain information (more generally, to change in certain ways the addressee's mental states: but for the sake of simplicity I will sometimes use the former formulation); but she also has the intention that this informative intention is recognized by the addressee. In fact, we can imagine cases in which *A* wants *B* to know *X*, but she doesn't want *B* to know that she wants that (that is, she doesn't want to be acknowledged as the source of information): in such cases, as it has become usual to say, there is an informative but not a communicative intention. In other words, genuine communication from *A* to *B* requires *A*'s intention that *B* recognizes her intention to exchange information with him (and affect his mental states).

This is strictly related to Grice's famous "Cooperative principle": in short, the generalization that in genuine communication the speaker has to give an appropriate contribution to the conversational exchange. As we said, the speaker wants that her intention to inform the addressee is recognized by him as such (as a *generic* intention to inform him). But she wants more than that: she wants that the addressee recognizes the *specific* way in which the speaker wants him to change his mental states in the present situation. Therefore, the speaker has to be cooperative in the sense of producing a communicative action that is appropriate for that purpose. In a terminology that is current in cognitive science, her communicative behavior is part of a "joint action", where speaker and addressee feel as a "we" with a common goal: the goal that some specific information is exchanged between them. This does not require that the speaker is cooperative with the addressee in every possible sense. She may want to deceive the addressee; but even in that case, "interlocutors always share at least one common goal, that of understanding and being understood" (Sperber & Wilson 1986/1995: 268; see Reboul 2017; Mazzone 2018: 12).

A final, crucial point is Grice's notion of "implicature", which is where inferences (and rationality) come fully into play. Human languages are to a great extent conventional, which means that in principle they allow for the coding and decoding of thoughts in communication (but see below for some complications). However, for Grice intentions are more important than conventions in this sense, too: most of the time, what the speaker intends to communicate in a specific situation ("what is meant") is something different from what her utterance can be taken to mean given its conventional meaning alone ("what is said"). When Romeo utters "Juliet is the sun", he means something different than the literal meaning of the sentence; and if someone shouts "I'm having a shower" while the home phone is ringing, the context is presumed to help understanding—beyond the conventional meaning of the expression—what the speaker presently cannot do with regard to the ringing phone. Generally speaking, Grice taught us to look at communication as involving inferences from what is said with an utterance to what is meant with it by the speaker in a specific situation: in short, as a form of practical reasoning.

More precisely, Grice distinguished between (what is usually called) "sentence meaning", the entirely conventional meaning of the utterance, and "speaker meaning", which he then divided into two parts: "what is said" and "what is meant". The former is obtained by submitting the sentence meaning to a couple of quite trivial pragmatic processes: disambiguation of ambiguous words and reference assignment to deictic expressions. Both of these processes are "pragmatic": consideration of the context is required in order to specify what is said by the speaker by using certain linguistic expressions. In other words, addressees need to look at the context in order to determine the

truth-conditions of the utterance (the complete thought or proposition expressed by the utterance) in that context. However, Grice's interest was especially focused on what happens next: once such a complete proposition *p* is determined, the context contributes further information allowing the addressee to infer another proposition *q*. It is this inferential transition from *p* to *q* which is called implicature.

Again, this notion is strictly related to that of communicative intention and to the Cooperative principle. In understanding an utterance, as we said, the addressee aims to reconstruct the communicative intention of the speaker, under the assumption that she is a rational agent involved in a cooperative action. This is crucial for the transition from *p* to *q*: in most cases, *p* cannot be what the speaker intends to communicate—if the speaker is rationally cooperative—because it is patently irrelevant to the situation ("Why are you telling me that you are having a shower?") or patently false ("How can Juliet be the sun?"). An implicature is an inferential transition to an indirect, implicit meaning *q* in cases where the direct meaning *p* would be *prima facie* incompatible with the Cooperative principle. In such cases, *p* is taken (not as the intended meaning but) as a cue provided by a rational speaker, given the situation, in order for the addressee to infer the further proposition that is actually intended.

In sum, the Cooperative principle is crucial in the derivation of implicatures: the addressee expects the speaker to be rationally cooperative, and when "what is said" by the speaker patently and deliberately violates that expectation this is a sign that a different proposition ("what is meant") is intended. Grice analyzes the cooperative attitude of the speaker (and the related expectations of the addressee) in four conversational maxims. Two of them are illustrated by the above examples: propositions that are patently irrelevant or patently false trigger the search for related but different propositions which are relevant and true in context. Besides the expectation that the intended meaning is true (maxim of quality) and relevant (maxim of relation), Grice mentions the expectation that the intended meaning is appropriately informative (it does not provide too much, or too little, information: maxim of quantity) and that the information is presented clearly and orderly (maxim of manner).

2.2 Relevance Theory

Grice's pragmatic theory was developed approximately between 1957 and 1982 through a number of papers, the most relevant of which were then collected in *Studies in the way of words* (1989). This is also the period in which cognitive science spread, and cognitively oriented linguistics developed as a robust research field, with special regard to syntax—but also phonology and lexicon. Starting from the 1980s, this development triggered an interest towards the cognitive status of pragmatics, too (see Domaneschi and Bambini 2020: 420). Based on his distinction between competence and performance, Chomsky (1980) introduced the notion of "pragmatic competence". But it was Asa Kasher (1991, 1994) who first used the term "cognitive pragmatics" and systematically explored the possibility of providing a modular and generative theory of pragmatics—"modular" with regard to the assumption that there is a cognitive module accounting for pragmatic competence; "generative" with reference to Chomsky's Generative Grammar.

In those years, a crucial step for the field was the publication of *Relevance*, a book where Dan Sperber and Deirdre Wilson (1986/1995) laid the foundations of the most comprehensive and influential theory in cognitive pragmatics to this day, known as Relevance Theory (RT). It was based on a Gricean framework, but with some important innovations. From Grice, Sperber and Wilson especially kept the idea that utterance understanding is a case of intention recognition accomplished by an inferential process. The main departure from Grice was the new centrality of the notion of relevance as a cognitive principle of functioning.

Grice had already recognized a role for relevance through the maxim of relation, which prescribes that the speaker's contribution is appropriate (i.e., relevant) at each stage of the transaction. But for Grice this was just one of the four maxims in which he analyzed the Cooperative principle, conceived as the rational rule that the speaker has to comply with—and that the addressee expects the speaker to comply with. Sperber and Wilson's approach is different in two ways. First, in their view relevance alone can do the job: the other maxims, and therefore the entire Cooperative principle, are actually subsumed under this notion. But most of all, relevance is not thought of as a rational norm that can or cannot be followed by interlocutors. On the contrary, their claim is that it is a principle of functioning of both cognition in general and communication in particular, based on how cognitive mechanisms actually (and necessarily) work. Specifically, Sperber and Wilson distinguish a "Cognitive" and a "Communicative principle of relevance". According to the former, human cognition tends to be geared to the maximization of relevance. We are exposed to so many sensory stimuli at any moment that we cannot process all of them, therefore our cognitive mechanisms must be capable of detecting the most relevant ones. Communication is different in that the cognitive system is not faced with a multitude of accidental stimuli, but with a message that has been intentionally produced by a speaker for an addressee. This is where the Communicative principle of relevance comes to the fore: according to it, every ostensive stimulus—i.e., every communicative act manifestly addressed to an interlocutor—conveys a presumption of its own optimal relevance (Wilson & Sperber 2002: 256–257). "Optimal relevance", in turn, is defined as the expectation that (a) the ostensive stimulus is relevant enough for it to be worth the addressee's effort to process it, and (b) it is the most relevant one compatible with the communicator's abilities and preferences (Sperber & Wilson 1986/1995: 270).

Sperber and Wilson provide an explicit definition of what they mean by relevance, in terms of the balance between the cognitive effects achieved by the interpretation of an ostensive stimulus and the efforts expended in reaching this interpretation. Intuitively, the effects are changes in the informational state of the addressee, but one also has to consider the costs because a cognitive system cannot realistically pursue informational changes irrespective of the time and effort required. In practice, relevance theorists propose that relevance in understanding is ensured by a heuristic—a fast and economic approximation to an ideal procedure that they call "relevance-based comprehension procedure", which has two steps. First, the cognitive system follows a path of least effort in computing cognitive effects—that is, possible interpretations are considered in order of accessibility. Second, the system stops when it reaches an interpretation that satisfies its expectations of relevance, otherwise it moves to the next most accessible interpretation.

What is then the interpretation of an utterance? Consistent with Grice's approach, it is conceived as a non-deductive inference where one of the premises is what is now often called the explicit meaning of the utterance (Grice's "what is said"), while the conclusion (or one of the conclusions) is a different proposition which, in the appropriate context, is the implicit meaning of the utterance ("what is meant" by the speaker in that context). For example, when the home phone rings and *A* says "I'm having a shower", the explicit meaning (minimally, the proposition where referents are assigned to all the deictic expressions in the utterance: but more on this below, in § 3.1) is one of the premises, which together with other premises (such as the common-ground assumption that a person who is having a shower cannot answer the phone) allows the addressee to conclude that *A* cannot answer the phone. Because of this structure, pragmatic processing is taken to be essentially inferential. In Sperber and Wilson's view, this does not imply that it is a deliberate and conscious process: on the contrary, in standard conditions it seems to be automatic and non-reflective. In short, according to RT, pragmatic understanding is an inferential process performed automatically through a heuristic based on expectations of relevance.

Starting from the end of the 1990s (Sperber & Wilson 1998; Wilson 2004; Wilson & Sperber 2002; Carston 2002), relevance theorists have come to propose that pragmatic processing does not

necessarily operate sequentially through forward inferences from the explicit meaning to contextual conclusions; a reasonable hypothesis is instead that comprehension involves forward *and backward* inferences operating in parallel (the latter being inferences from expectations about the contextual conclusions backwards to explicit meanings), so as to cause a mutual adjustment between explicit and implicit meaning.

Another point where RT is in line with Grice is the claim that utterance comprehension is a case of mindreading (Sperber & Wilson 2002): forming an interpretation involves the attribution of a state of mind (specifically, a communicative intention) to the speaker. Moreover, as we saw, RT's notion of optimal relevance presupposes that addressees have expectations regarding the communicator's abilities and preferences. Now, this clearly requires that pragmatic processing has access to information about other minds—that is, information from mindreading processes.

This raises the further cognitive issue of whether comprehension is achieved by the very same module that is supposed to perform mindreading. Sperber and Wilson propose instead that it is performed by a sub-module of that module, characterized by its own principles of functioning. Generally speaking, while the first edition of *Relevance* (1986) proposed that the inferential process of comprehension is based on the central system of thought, starting from the second edition (1995) relevance theorists assume a modular view: that is, the view that comprehension is achieved through a process that is specific to that task.

3. Critical Issues and Topics

3.1 Contextualism versus Minimalism

Relevance theorists have also played an important role in the intense debate about the division of labor between semantics and pragmatics which, especially in the first decade of this century, has pitted contextualists against minimalists. As we saw, according to Grice human communication does not necessarily require a conventional code. However, once a code is in place comprehension can make profit of it: Grice proposes that the first step of the process is linguistic decoding, which is then followed by pragmatic processing. In the view he defends, which is close to what is today called literalism, the claim is that the sentence has its own (literal) meaning—that is, it conveys a proposition with its own conditions of truth—irrespective of its use in context (of what the speaker may mean with it). As we already know, Grice was ready to acknowledge that in order to have a proposition some simple pragmatic processes are required (i.e., reference assignment and disambiguation), but this can be thought as a minor adjustment to a literalist picture.

Recently, however, there has been growing recognition that sentences are hardly the bearers of unique and complete meanings until contexts are taken into consideration. The actual amount of ambiguity/incompleteness of sentences—and therefore the need to consider the communicative intention in context in order to have a unique and complete proposition—is much greater than Grice and early literalists had thought. This notwithstanding, many have tried to stay as close as possible to literalism by assuming that the contribution of context at this stage is not free (and dependent on the speaker's intention): on the contrary, it is entirely constrained by the sentence, either in visible or invisible ways. As Recanati (2004: 85) put it: "Literalism in its modern form holds that the truth-conditions of a sentence are fixed by the rules of the language (with respect to context) quite independently of the speaker's meaning". This means that (at this stage) any appeal to context is in fact constrained by linguistic rules—be they visible at the level of surface syntax or given at some deeper level of syntactic analysis. In other words, there is a minimal proposition (hence the name "minimalism") whose content is entirely "triggered by the grammar" in the sense that "the sentence itself sets up a slot to be contextually filled" (Recanati 1993: 240). Another way to put this view is that "what is said" is affected only by linguistically mandatory bottom-up processes of "saturation" but not by contextually driven top-down processes of "free enrichment" (Recanati 2002).

Against this view (defended, among others, by Stanley 2000; Borg 2004; Cappelen and Lepore 2005) contextualists (especially Recanati and relevance theorists, e.g., Carston 2002, 2008) insisted it is not enough to say that the context affects "what is said" more than Grice had thought: as a matter of fact, it contributes to explicit meaning in pervasive and unpredictable ways. In other words, the sentence essentially underdetermines "what is said" by the speaker with it: language is radically ambiguous and incomplete. For some examples, consider the following cases: the sentence "Julie is tall" requires the addressee to determine the comparison class against which the adjective "tall" has to be evaluated ("tall" with respect to what?); in the sentence "the book of Mr. Smith is on the table" there are many ways to interpret "of" (Has Mr. Smith written the book? Is he the owner? Is it the book Mr. Smith borrowed from the library? and so on); a simple word such as "window" can be used to mean the frame, the glass pane, the open space in the wall, something one can see through, etc. These and innumerable other examples suggest that only in context can the meaning of any linguistic item be determined.

As Bezuidenhout (2017) has noted, the debate between minimalism and contextualism can be approached from quite different perspectives. It can be framed as a conceptual analysis aimed at discerning "what there is" (do minimal propositions exist?), as is traditional in analytic philosophy; or it can be instrumental to a formal logic analysis of natural languages; but it has a cognitive import, too, in two different senses.

First, the debate is thought to have something to say about cognitive *processing*. While minimalists (in particular, Cappelen and Lepore 2005) insist that the notion of minimal proposition has psychological reality, contextualists take the opposite view. As Recanati (2004: 64) put it: "The minimal proposition is a hybrid which goes beyond what is determined by the rules of the language yet has no psychological reality and need not be entertained or represented at any point in the process of understanding the utterance." In other words, his claim is that there is no processing stage whose output is a complete (truth-conditional) proposition obtained by considering all and only the contextual information that is strictly mandatory given the rules of language. The result of such a process might not be a complete proposition—it might be instead "a schema or template for building propositions" (Carston 2008: 324). But even if it could provide a complete proposition, this does not seem to be the kind of thing that the addressees need to represent in the course of the comprehension process: it appears to be a uselessly vague proposition at best—in our previous example, the proposition according to which the book is *of* Mr. Smith in some very abstract way. In other words, it is not clear why the cognitive system should pass (or whether, given the current evidence, it actually passes) through such a proposition, instead of straightforwardly adjusting the word meanings with respect to context (e.g., by selecting the appropriate contextual sense of "of"). In sum: while in some cases it is hard to imagine a complete minimal proposition, in others this can be imagined but is quite abstract, and it is unclear that the cognitive system needs to pass (and actually passes) through it.

Second, the debate has consequences for the conception of lexical meaning, with regard to both its structure and nature. A widespread assumption in semantics is that lexically encoded meanings are concepts, mostly conceived as unanalyzed atoms (e.g., mental labels in the sense of Fodor 1975), and that in the normal case there is just one lexicalized concept for each word. This is certainly compatible with minimalism, while it is not clear that it makes sense in the perspective of contextualism (see Carston 2012). In this latter perspective, even assuming there is one single lexicalized concept, this is not what is normally fed into the comprehension process: instead, the first proposition actually constructed already contains modulated concepts—that is, concepts resulting from contextual modulation. But then, what is the point of having a single lexicalized concept, if it is rarely fed into sentence meaning? Even worse, for most words a meaning that is stable across contexts would be so abstract as not to behave as a concept for (at least) one crucial aspect: it is unlikely to feature in actual thoughts (and in actually communicated propositions). In sum, contextualism tends to what Recanati (2004) called the "wrong format view": the idea that (Fodorian) concepts do not generally

have the right format to be the meanings of words. As Sperber and Wilson put it, lexical meanings are rather something like "pro-concepts", pointers to concepts that can be selected on occasion as contextually intended meanings. These concepts that provide the occasional meanings of words in context are often referred to as "ad hoc concepts".

3.2 The Role of Consciousness in Pragmatics

Relevance Theory, as we said, has always claimed (with one important exception we will turn to below) that utterance understanding is accomplished through an automatic process, which does not involve consciousness in any interesting sense. Automaticity is one of the hallmarks of modularity as Fodor (1983) characterized it, and the wide acceptance of this notion has contributed to spreading the idea that consciousness might not be necessary even with respect to (what seem to be) high-level cognitive processes, such as language comprehension.

In pragmatics, a different view has been taken by Recanati (2004) according to whom utterance understanding involves two quite distinct mechanisms, which he calls "primary" and "secondary pragmatic processes". While the former are unconscious and pre-propositional (i.e., they concern the adjustment of single words in view of the context), the latter are high-level processes involving the conscious transitions between propositional contents. In other words, secondary pragmatic processes are meant to capture precisely the sort of inferences that Grice called implicatures and, in contrast to RT, Recanati proposes that consciousness is a defining feature of those transitions. In his view, the addressee is aware to some extent both of the explicit meaning of utterances—i.e., the proposition derived from literal meaning through automatic contextual modulation—and of the fact that, in context, the explicit meaning is used as a cue to a different proposition.

This claim—that the inference from explicit to implicit meaning is a conscious process—is faced with two main problems. First, utterance understanding is typically fast and effortless, which strongly suggests automatic processing (for a well-established description and theory of automaticity, see Logan 1989). Second, there seems to be no sharp divide between the construction of explicit meaning and the inference to implicit meaning, as to their conscious accessibility. We are not always introspectively aware of the latter; conversely, we seem to be occasionally aware of the former (linguistic examples pointing in this direction are discussed by Carston 2007).

As a way out of these problems, Recanati has proposed that understanding requires "conscious availability", not actual consciousness. However, this might explain why the process is fast and effortless at the cost of conceding that it is automatic, after all: that pragmatic inferences are "available" to consciousness apparently means that conscious processing might occur in substitution for the process that is actually occurring, which is *not* conscious (see Mazzone 2015: 292, 2018: 75).

On the other hand, it might be objected that complete automaticity is incompatible with practically any cognitive process of reasonable complexity. Even dual process theory—which takes the distinction between automatic and conscious systems of processing as essential to the explanation of thinking and reasoning—often describes the automatic system as involving conscious attention "in a comfortable low-effort mode" (Kahneman 2011: 24). In other words, with regard to most cognitive processing the important distinction seems to be that between automatic processes accompanied by a low degree of consciousness on the one hand and full-fledged conscious processes on the other. In the former case, consciousness can be thought to play nevertheless an important role in active maintenance, amplification, and inhibition of information for the task at hand (Mazzone 2018: 118, see also 85–94 for examples of how consciousness in a low-effort mode might account for pragmatic phenomena). From a neurocognitive point of view, consciousness—even in the low-effort mode—is allegedly associated with self-sustaining loops of activation distributed over large areas of the cortex, involving both higher association cortices and sensory-motor areas (e.g., Dehaene 2014). These loops are thought to provide the working-memory space where information

is actively maintained for the current task—in contrast to simple mechanisms of spreading activation, which is local and decays in fractions of seconds.

Interestingly, even relevance theorists have recently acknowledged a role for consciousness in pragmatic processing, with specific regard to Robyn Carston's dual theory of metaphor (Carston 2010). In her view, simple metaphors are adequately explained by the standard account of Relevance Theory, according to which lexical meanings are always "pragmatically adjusted or modulated during comprehension" (Carston 2010: 301), with metaphors being just the extreme of a continuum of loose uses. In contrast to this "process of rapid on-line ad hoc concept formation" (Carston 2010: 308), when it comes to "more extended and/or literary examples" (304) a second processing route might be required, where "the literal meaning of metaphorically used language is maintained […], and subjected to slower, more reflective interpretative inferences" (308). In practice, in these cases the literal meaning—including the images that come with it—is attentively represented and integrated within the target domain. This attentive focus and maintenance in working memory is acknowledged to be a manifestation of a "slower, more consciously controlled, reflective processing" than the standard account of RT predicts.

4. Current Contributions and Research

4.1 Against Inferential Pragmatics

As Kasia Jaszczolt (2019) has shown quite recently, in the last decades all the main aspects of Grice's view have been challenged—which leads her to ask what it means to be Gricean today. The challenges concern the explanatory role of both inferences and intentions, that is, the two main pillars of his theory. Let us start from the first point.

Against the inferential account, it has been claimed that comprehension is mostly direct and non-inferential. This view is well exemplified by Recanati (2016), according to whom,

> a speaker's thought is essentially indexical, in the sense that in thinking one employs context-dependent and perspectival private modes of presentation, and is represented as such by the addressee. Presenting it as 'a thought expressed by an utterance' distorts the picture.
>
> *Jaszczolt 2019: 18*

Recanati's idea of "indexical thoughts" traces back to Evans, who famously claimed that "there are thoughts which one can have only because one occupies a particular position in space or time, or because one is currently perceiving an object" (Dummett 1981: 122). In short, thoughts can be intrinsically dependent on our perceptual point of view. But then, there is not a thought expressed by the utterance, that the speaker aims to convey and the hearer to recover via inferences: there are instead "the speaker's thought and the thought formed by the hearer if communication is successful" (Recanati 2016: 119). Recanati proposes that we should therefore give up "the Naïve Conception of Communication as the replication of thoughts, in favour of a conception on which the speaker's and the hearer's thoughts are merely coordinated" (Recanati 2016: 120). In this view, linguistic information (together with the context) only provides constraints in the service of this coordination of thoughts; it does not provide the starting point for a shared inference.

A related point that has been questioned is the layered (or "pipeline") account of meaning, that is, the idea that in comprehension there is a cognitive sequence of steps starting from linguistic decoding, passing through the explicit meaning—according to literalists, via the intermediate step of the minimal proposition—and then delivering as a final result the implicit meaning of the utterance. As we already saw, contextualists call into question the psychological reality of minimal propositions. More radically, Jary (2016) argues that we do not even need to form a representation of the explicit content warranting an inference to the implicit content. His argument seems to be,

at least in part, epistemic (we don't need a rational warrant for the final step of comprehension just as we don't need it for perception: the implicit assumption of a normally functioning mechanism is sufficient), but it suggests a cognitive conclusion, too. Jary calls into question relevance theorists' view according to which there cannot be genuine implicatures if the implicit content is just activated as "a case of association triggered by a perceived ostensive stimulus"; what is further needed, in their view, is the existence of an inferential procedure that relates explicit and implicit meaning as a premise to a conclusion. Thus it seems that, in contrast to RT, Jary is sympathetic with a perceptual-based, associative account of comprehension.

The distinction between explicit and implicit meaning—and the reality of the explicit meaning—has also been called into question, in a more formal perspective, in the tradition of game-theoretic semantics (Lewis 1969; Barwise & Perry 1983; Parikh 2010), and by the Default Semantics proposed by Jaszczolt (2005, 2010).

A much-discussed contribution to this anti-inferentialist trend is Lepore and Stone (2015: 5), according to whom, "the thinking involved [in pragmatic processing] is heterogeneous and diverse—it's not just a circumscribed or uniform application of principles of rationality". In practice,

> the inferences speakers invite their audiences to draw from their utterances are not as pervasive as the theory of CI [conversational implicatures] pretends, and do not form a natural class. Put most starkly: we have no use for a category of conversational implicatures, as traditionally and currently understood.
>
> *Lepore & Stone 2015: 6*

In their view, pragmatic processing is not primarily based on inferential reasoning but on a form of disambiguation—or, so to speak, of pattern recognition: the addressee has to recover the appropriate "grammatically specified pairing of form and meaning" (Lepore & Stone 2015: 88). We will turn to this appeal to grammar shortly.

Importantly, however, the above considerations against inferential processing depend on the assumption that the inferential account on the one hand and the perceptual-based, associative account on the other are incompatible with each other. Sperber and Wilson (2015: 137) propose a different view, according to which,

> not all inferences involve step by logical step derivations of explicit conclusions from explicit premises. Arguably, the vast majority of inferences made by humans and other animals do not involve such derivations […] More generally, many (if not all) inferences can be described not as more or less standard logical derivations but as competitions between alternative conclusions (it will rain/it won't rain, let's go for a walk/let's not, and so on). The winner of such competitions is determined by activation or inhibition caused by brain states that represent information in all kind of ways […] If the mental mechanisms which decide the outcome of such competitions tend to favour warranted conclusions, then although the process is quite different from a sequence of good old syllogisms, it would still be genuinely inferential.

In other words, according to Sperber and Wilson (2015), changes in patterns of activation due to associative activation/inhibition might account for most of our inferential processing, provided that the mechanism tends to favor warranted conclusions.

If Sperber and Wilson (2015) are right, there is no opposition between inferential and associative accounts, contrary to what is often assumed (even by relevance theorists in other contexts). Mazzone (2018) proposes that the alleged opposition is an unfortunate consequence of the

ambiguity of the term "association" (and "associative"). In particular, activations within an associative network may count as inferential transitions provided that the network represents not only arbitrary correlations between stimuli (mere *associations*, in one sense of the term), but also schemas representing how those stimuli are related to each other—by spatial, temporal, causal, part-whole, functional relations, and so on. Such schemas allow the system to draw motivated transitions (from one to other components of a schema), so that the dynamic of associative activation and competition within the network is rationally constrained. Nevertheless, what occurs in the network is a "spreading cascade of activity" (Kahneman 2011: 97), while the sort of rational reconstructions that we call implicatures require us to focus on a very limited portion of the actual pattern of activation—based on what is thought to be conceptually most relevant. This might account for the growing perception that addressees do not actually need to form distinct representations of premises and conclusions in comprehension.

4.2 Against Intentions

Another traditional target of criticism is Grice's notion of communicative intention. As Jaszczolt (2019) notes, there seems to be a theoretical contrast between approaches based respectively on the Gricean notion of intention and the Austinian notion of convention: "In Speech Act Theory, the emphasis is on conventions and patterns. So, the order of explanation appears to be the opposite from that adopted by Griceans: speech acts explain speakers' intentions as it were rather than the other way round" (Jaszczolt 2019: 219). This preference for social conventions over individual intentions in the explanation of communication has been famously defended in anthropology (Rosaldo 1982) but also in philosophical/linguistic theory (Saul 2002; Chierchia 2004; Arundale 2008; Lepore & Stone 2015; Geurts 2019), either emphasizing the role of grammar (and grammatical knowledge) or that of social norms.

The basic idea is simple and intuitively sound: why would addressees need to "read" others' minds if there are conventions that allow them to comprehend utterances? To be sure, as Geurts (2019: 7) notes, "once derived, an interpretation may always be capped by concluding that it was so intended by the speaker; but this is a flourish added after the fact, not a key step in the interpretative process". In Geurts's view, the notion of intention is therefore an "idle wheel", with no explanatory power: we understand communicative intentions thanks to conventions, not the other way round.

It should be noted that, in the conventional view, the notion of inference shares the same fate as intention, since conventions (or, as they often say, "grammar") seem to make inferential reasoning equally unnecessary.

Defenders of intentions and inferences may argue that linguistic conventions logically presuppose the ability to infer communicative intentions: how do those conventions come into existence in the first place, if not through conventionalization of communicative behaviors which require the ability to mindread? But, in turn, conventionalists might object that the advantage of forming conventions is precisely that addressees can at last get rid of mindreading.

In the end, therefore, the issue boils down to the question of how conventional or not is linguistic communication even when a linguistic code is established. If contextualists are right, conventions are largely insufficient to determine (both explicit and implicit) meaning: in order to contextually adjust the meaning of utterances, radical ambiguity imposes a lot of reasoning with regard to context (and what the speakers intend to do in it). But it is possible to pursue a different line of argument, which does not commit one to contextualism. The point is that the critics of intentions seem to impose too high a standard when they claim that intentions are "idle wheels" if they are derivative from conventions.

First, it is far from obvious that coming to represent an utterance interpretation as intended by the speaker is just a useless "flourish", as Geurts puts it. There are strong reasons to think that we

humans perform forms of practical reasoning and action control, by representing chains of goals related to each other (also) as means to ends (e.g., Bratman 1992; Baldwin & Baird 2001; Cooper & Shallice 2006; Wolpert et al. 2003; Glenberg & Gallese 2012; for a discussion see Mazzone 2018: §§2.10, 4.2, 4.3). The ability to mutually adjust explicit and implicit meaning might be nothing other than a manifestation of such a capacity: the explicit meaning is a means to pursue a communicative goal in context. Moreover, the utterance may be (and normally is) part of some non-communicative practice with its own goals, so that the implicit meaning is a means to reach some further goal in that practice. If, for instance, I cry "I'm in the shower", and my wife understands that I cannot answer the phone, this understanding (a change in the mental state of the addressee) can be a means for the further goal of causing her to answer the phone (an action). But all these means-ends computations on chains of goals require that certain representations are acknowledged as "of" goals in the first place. If this is correct, then representing the utterance interpretation as a goal/intention is not a useless flourish at all.

But there is a second, related point. The fact that intentions or goals have to be read from something else is not an argument against them. Mental states have to be read from perceptual regularities anyway—there is no mindreading in any literal sense. For one example, if a person lifts a fork to her mouth, we expect that she has the intention to eat and swallow the food. Conventions are just a special case of the regularities through which we attribute intentions and goals. Levinson (1992) provides an insightful description of how social conventions (and especially what he refers to as "activity types") are structured as patterns of goal-directed behaviors. In practice, communicative moves are embedded within activity types in accordance with a means-ends structure, so that any move pursues some sub-goal of the overarching goal(s) of the activity type. So, when Geurts (2019: 2) analyzes the conventional utterance "I hereby declare the cricket season open", and based on that example concludes that "the speaker's mental state is not always relevant to the successful performance of a speech act", one may wonder whether this is a useful way to frame the cognitive point at issue. To be sure, hearers are not interested in what the speaker has in mind *beyond* what can be inferred from what she said, given the conventions at play. But from a cognitive point of view, hearers would be surprised if later the speaker behaved in a way that is inconsistent with what her statement implies, given the conventions at play. And this expectation of coherence plausibly means that hearers tend to attribute to the speaker the *intention* to cause the conventional consequences of what she said: in our example, the fact that the cricket season is open. Not only do hearers understand the conventional consequences of that utterance, but they also assume that the speaker is aware of those consequences, too, and intends to cause them (even if she disliked them: other mental states than the one committed by the conventional procedure are not relevant).

To summarize, intentional interpretations of utterances seem to be necessary in order to embed linguistic moves within the context of wider chains of goals (i.e., goal-directed human practices), and therefore within (theories of) action control and practical reasoning. Moreover, mindreading seems to be an inferential activity based on expectations justified by perceptual regularities, with conventions being just a special case of those regularities.

If this is true, there is no conflict between intention-based and convention-based accounts of pragmatic processing, just as there is no conflict between inferential and associative processing. Conventions are part of the stored regularities—the schemas—which provide constraints on associative activations; but, thanks to such constraints, those activations may count as rational inferences. Besides, conventions are *intentional* regularities: regularities concerning intentional behaviors. As such, they enable inferences about intentions.

4.3 Comprehension, Reasoning, and Mindreading

The hypothesis that conventions and intentions are different facets of the same pragmatic process is perhaps unpalatable to most—although in her discussion of the topic, Jaszczolt (2019: 22)

explicitly suggests "the possibility of blending of convention- and intention-based accounts". As a matter of fact, not only do critics of intentions and inferences in pragmatics look at conventions as an alternative, but also according to the standard image of what Grice had in mind, pragmatic reasoning and linguistic processing based on "grammar" (in the current wide sense) are different kinds of processes. Thus, it may be appropriate to provide some theoretical support to the hypothesis that they are bits and pieces of the same process.

First, in cognitive science there is a tradition that looks at thinking and reasoning in terms of pattern recognition. One case in point is Kahneman, who approvingly quotes the classic thesis of Herbert Simon that smart intuition is nothing but recognition of patterns: "The situation has provided a clue; this clue has given the expert access to information stored in memory, and the information provides the answer. Intuition is nothing more and nothing less than recognition" (Simon 1992, quoted by Kahneman 2011: 11). A very insightful analysis of reasoning as a case of pattern recognition is Margolis (1987); see also Evans (2006: 380) for the idea that reasoning is contextualization of problems "with reference to prior knowledge elicited by contextual cues and the current goals that are being pursued"—an idea that is traced back to Stanovich's (1999) "fundamental computational bias".

Also, in the research field of conditional reasoning the essential role of patterns and schemas has been recognized at least since Cheng and Holyoak (1985). Generally speaking, while early theories assumed that conditional reasoning was based on formal rules—possibly implemented by innate cognitive structures—it has become progressively evident that it is instead significantly dependent on the content of experience (for a review, see Elqayam 2017; Mazzone in press). Cheng and Holyoak (1985) have contributed to this theoretical shift by proposing that the better performances in Wason's selection task when applied to the deontic domain—compared to more abstract versions—are accounted for by "pragmatic schemas", that is, representations of schematic regularities in the relevant domain of practice (for other important steps in the same direction, see especially Manktelow & Over 1991; Oaksford & Chater 1994). Markovits (2015) argues that while this "pragmatic interpretation" of reasoning tasks may account for difference in performance *between* domains (since different pragmatic schemas apply to different domains), individual variation *within* domains might be accounted for by semantic memory as well, in terms of the online retrieval of specific information associated to the content of the premises.

These considerations might shed a different light on the growing importance assigned to pattern recognition in linguistics and pragmatics. After the long dominance of the Chomskyan theory of syntax (conceived as formal manipulation of symbols based on innate mechanisms), in the last decades construction grammar and other similar approaches have convincingly argued that syntax can be accounted for in terms of stored regularities (specifically, form-function units) at different levels of abstraction. Recently, the construction-based approach has been extended to pragmatics: it has been proposed that not only syntactic rules but also "Gricean maxims, information structure, illocutionary force and larger discourse structure" can be accounted for as stored patterns (Cappelle 2017: 115, which provides a review of the relevant literature on the topic). That illocutionary forces might be encoded as patterns in memory has also been proposed by Sbisà (2014: 475): according to her, the Austinian "conventional procedure" might be thought of "as a script of a particular kind, establishing at the same time the meaning of the verb (usually with possible performative use) that designates the illocutionary act kind and the features of the prototypical successful performance of an illocutionary act of that kind". Assuming this is true, does it mean that pragmatics is not a case of practical reasoning, to the extent that it is instead a case of application of grammatical (or conventional) regularities? Given what we have been saying about reasoning as pattern recognition, there is another possibility. What the construction-based approach might provide us with is an explanation of how pragmatic *reasoning* is performed: it is content-dependent reasoning based on the storage of domain-specific patterns.

In this approach both comprehension and reasoning depend on, and develop with, experience. A similar approach has been defended with regard to mindreading as well. Based on the intercultural and interindividual variability of the data in this domain, some scholars have proposed that mindreading is a complex ability which is largely constructed out of experience and therefore may be present in varying degrees along the developmental course (e.g., Garfield et al. 2001; Hughes et al. 2005; Ruffman 2014; Christensen & Michael 2015; Fenici 2017; Frank 2018).

In sum, comprehension, mindreading, and reasoning might be the names for families of capacities which are based on domains of experience, interact with one another, and develop concurrently. To be sure, the modular alternative—according to which there are distinct innate processes specialized for each of those domains—is not entirely out of fashion. However, at least in pragmatics modularism may have lost some of its appeal, given the growing role assigned to associative processing and conventions: the former provides a domain-general mechanism for pragmatics, the latter provide domain-specific knowledge apt to constrain that mechanism. Thus, a domain-specific mechanism seems no longer required.

4.4 Experimental Evidence

In a recent review, Domaneschi and Bambini (2020) consider the experimental evidence in favor of the claim that pragmatics is an exercise in mindreading, and find it lacking. Their claim is that "pragmatic competence is not limited to the ability of understanding other people's intentions, but it has its own characterization in terms of developmental trajectories, patterns of decay, and neural substrates". In practice, they adopt a pluralistic perspective according to which "a cluster of cognitive functions supports pragmatic processing, in ways that differ across types of pragmatic tasks". Different pragmatic phenomena are considered, which seem to involve different cognitive abilities. For instance, deixis seems to have little to do with mindreading, while it recruits a network of cognitive abilities, from vision to the construction of frames of reference via attention and working memory. Working memory and construction/updating of discourse mental models are also involved in the processing of presuppositions. In short, pragmatic competence

> might exploit an array of other cognitive abilities, differently engaged depending on the specific task. Tasks such as metaphor and scalars might be linked to vocabulary knowledge and only minimally to ToM [Theory of Mind, i.e., mindreading], while other tasks, such as irony, might greatly capitalize on mind reading skills.

Do these conclusions contrast with those of Frank (2018: 116), according to whom "the evidence […] indicates a significant overlap between the neural basis of ToM and that of pragmatic comprehension"? Of course, it is not necessarily so. Given our previous picture of pragmatic processing as a cascade of activation spreading across large areas of the brain networks, it is possible that the areas involved in the recognition of intentions—possibly through processes of pattern recognition—are only the core of larger and more complex clusters in the brain. Moreover, when using subtractive methods in the study of pragmatic phenomena—e.g., deixis or presuppositions—we can plausibly expect to find activations that are specific to those phenomena, while what is common to communication in general is canceled away.

5. Future Directions

It is not an easy exercise to predict where cognitive pragmatics is heading, but some current trends are apparent.

First of all, there is a clear tendency towards a more empirical approach than in the first 50 years of the discipline, which were mainly devoted to philosophical-linguistic analysis. Starting from Noveck and Sperber (2004), the new subfield of experimental pragmatics has gained prominence, and today there are projects and research communities dedicated to it (see also Noveck 2018). In the same line, there has been growing interest toward clinical pragmatics (Cummings 2009, 2017; Schneider & Ifantidou 2020) and, most of all, neuropragmatics (Bara & Tirassa 2000; Bambini 2010; Hagoort & Levinson 2014).

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Related Topics

cognitive poetics and the problem of metaphor; cognitive linguistics and discourse studies

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COGNITIVE POETICS AND THE PROBLEM OF METAPHOR

Jeroen Vandaele

1. Definition, Names, and Topics

The term *poetics* goes back to Aristotle's treatise on tragedy and stands for the "critical and analytical treatment of poetry" where *poetry* is "the general name for literary expressions in diverse forms" (Zhang 2011: 631–632; see also Reed 2012: 1058–1059). In this sense poetics is another name for literary criticism or literary theory. Culler (2002) argues, however, that the term *poetics* specifically denotes the kind of literary analysis that focuses on *principles* of literary meaning production—on "devices, conventions and strategies" (vii)—and not just on interpretation per se. Culler's specification certainly applies to Aristotle and much literary analysis that has called itself poetics since the 1970s (see, e.g., the journal *Poetics Today*). In 1992 Tsur coined the term *cognitive poetics* (CP) to describe the kind of poetic analysis he intends to pursue—a poetics that attends to principles of cognition, including principles of perception, emotion, attention, memory, imaging, and language understanding (see also Tsur 2002: 280–281). Tsur's work focuses on poetry in the strict sense (i.e., poems) yet is part of a broader field of cognitive poetics (or cognitive stylistics, or cognitive literary theory) that focuses on literature in general.

Broadly speaking, then, cognitive poetics is the interdisciplinary endeavor to understand the poetic effects or aesthetic qualities of literary texts as products of interactions between the human mind (and its cognitive principles) and literary texts with their specific makeup. Cognitive poetics investigates topics as diverse as narrativity, mechanisms of empathy and immersion, distancing effects and defamiliarization, the nesting of perspectives in narrative fiction (e.g., 'metarepresentation'), cognitive universals of literature, humor and irony, poetic metaphors, mental imagery and emotion, linguistic mechanisms of creativity, effects of form-meaning similarity (i.e., iconicity), meter, figure-ground perception, and so on (for a broad range of topics, see, e.g., Stockwell 2002; Gavins & Steen 2003; Herman 2003; Hogan 2003; Veivo et al. 2005; Brône & Vandaele 2009; Jaén & Simon 2012; Zunshine 2015; Alber et al. 2018; Burke & Troscianko 2017; Cave & Wilson 2018; Csabi 2018; Kukkonen 2019).

2. Perspectives and Tensions

It follows from the above characterization that CP borrows concepts and methodologies from a wide array of academic disciplines and specializations. On the one hand, an important number of

literary analysts question the possibility of combining stimulating literary analysis—which should produce nontrivial interpretations—with the methods and terminology of (cognitive) science. Thus, Jackson's (2002, 2005) critique of CP is reminiscent of Stanley Fish's incisive critique of the scientific aspirations of 1970s stylistics: CP is said to use a jargon-ridden apparatus that produces trivial interpretations and obscures the central part played by the interpretive skills of the analyst. Skillful text interpretation—hermeneutics—does not require any specific theory of signs (Todorov 1977: 30–31) or of the mind. Jackson's critique is also reminiscent of Culler's aforementioned divide between poetics and hermeneutics, C. P. Snow's divide between the "two cultures" of the sciences and the humanities (see also Veivo et al. 2005; Vandaele & Brône 2009), and the different "levels of explanation" appropriate for different scholarly objects of investigation. An entirely bottom-up treatment of literature—from the building blocks of lower-level science upward—is unfeasible because literature is on a "high" explanatory level that comes with its own emergent properties and principles (Jackson 2002: 206; Hogan 2003: 202ff; Bruhn's 2011 discussion of Franchi & Güzeldere 1994).

On the other hand, scholars working within CP present interdisciplinarity as a strength and claim to bridge disciplinary divides and fill gaps between levels of explanation. As Gavins and Steen (2003: 2), for example, write, "CP ties the study of literature in with linguistics, psychology, and cognitive science in general". Many foundational texts stress the interdisciplinarity of CP, yet the suggested hierarchy of disciplines varies. First, Turner (1991: 3) claimed the centrality of cognitive science, as he subsumed literary studies under linguistics, and linguistics under cognitive science: "the study of literature must live within the study of language, and the study of language within the study of the everyday mind". Second, other practitioners stress the centrality of linguistics (stylistics) among the various relevant disciplines. "Cognitive stylistics", say Culpeper and Semino (2002: ix), "combines the kind of explicit, rigorous and detailed linguistic analysis of literary texts that is typical of the stylistics tradition with a systematic and theoretically informed consideration of the cognitive structures and processes that underlie the production and reception of language". Stockwell (2002: 60) also points out that it is specifically "stylistics", the linguistic sub-discipline, that "has embraced advances in psychology, social theory, and discourse analysis, as well as the philosophy of language and critical theory". Third, practitioners such as Zunshine (2015) or Bernaerts et al. (2013: 10) adopt the umbrella term *cognitive literary theory* or *studies*, which suggests that literary theory, or literary studies at large, is the more central discipline among the many disciplines relevant for the field—although Richardson (2006: 544) adopts the same label (*cognitive literary*) to emphasize the field's "critical engagement with the best contemporary work being produced in leading university departments of psychology, linguistics, neuroscience, and philosophy of mind".

Even though the term *poetics* has in structuralist times also been used to subsume literary studies under linguistics (cf. Jakobson's statement that "poetics may be regarded as an integral part of linguistics" (1958: 63)), *cognitive poetics* is possibly the less belligerent and more interdisciplinary term, as it obviously refers to Aristotle's groundbreaking treatise and therefore antedates any disciplinary division between linguistics, literary studies, and cognitive science: in *cognitive poetics* we find an ancient and prestigious pre-disciplinary term to denote modern-day interdisciplinary dialogue (see, e.g., Bruhn 2011 on the conditions of dialogue on equal footing).

Whichever terminology and hierarchy is preferred, the common challenge of the field—its *raison d'être*—is to combine the knowledge of disciplines in order to clarify how the human mind works in interaction with literary texts, and how specific kinds of poeticality arise as a function of specific interactions. On the one hand, CP intends to study literary mindlife, that is, the working of the mind in a literary context (Freeman 2002: 43), in ways that tie in with and apply insights and sometimes methods developed in cognitive science (cf., e.g., Troscianko 2014). On the other hand, CP suggests that literary analysis, if cognitively tuned, will contribute to cognitive science's general understanding of the human mind (cf., e.g., Vandaele & Brône 2009: 1–3)—for as Hogan (2003: 3)

puts it, "if you have a theory of the human mind that does not explain the arts, you have a very poor theory of the human mind".

An important challenge is terminological. If CP intends to be a genuine interdiscipline, its practitioners need to make themselves clear to each other in spite of the diversity of backgrounds and vocabularies (see Jackson 2000: 332). Given the many theoretical points of departure in CP, the present chapter does not assume specialist knowledge of any cognitivist framework. Furthermore, unlike the numerous interesting essays that introduce CP generally,[1] this chapter specifically zooms in on the CP of metaphor so as to illustrate the complexity of doing CP. The complexity of practice derives from the object of study (here, the poetic qualities of metaphor), the great number of theories that claim to explain this object in relation to cognition, and the estimated relevance of those explanations for literary analysis. The two cognitive linguistic theories that intend to explain metaphor—Conceptual Metaphor Theory and Blending Theory—will be treated in relation to other cognitive theories of metaphor inasmuch as they together throw light on poetic metaphor.

3. Metaphor: A Critical Issue

Cognitively speaking, metaphor is the act of thinking or verbally framing something (often called the 'target', 'topic', 'tenor', or 'principal subject') in terms of something else (often called the 'source', 'vehicle', or 'subsidiary subject'), although an important strand of cognitive theories argues that the framing is bidirectional or interactional, that is, it also goes in the 'target-to-source' direction (which turns *target* and *source* into misnomers because both sides of the metaphor are now both source and target). In a unidirectional ('source-to-target') view, if someone tells me *Your theory is on shaky ground*, she wants me to understand my theory (the topic or target) as something that stands on shaky ground (the vehicle or source). In a bidirectional view, if I say that *Man is a wolf*, I understand and frame man (my topic or target) as a wolf (my vehicle or source), also noting that this humanizes the wolf to a certain extent because the wolf traits being alluded to are only those that may credibly apply to men as well (cf. Black 1962: 41–44).

This initial definition is cognitive in the sense that it signals the mental work involved in metaphor use, and it seems broad enough to include very different cognitivist theories of metaphor. Lakoff and Johnson (1980: 5; see also below), the founders of unidirectional Cognitive Metaphor Theory (CMT), noted for instance that "the essence of metaphor is understanding and experiencing one kind of thing in terms of another".[2] An heir of Black (1962), Glucksberg (2001: 1) explicitly opposes CMT, yet his "interactive property attribution" theory of metaphor nonetheless relates to our initial definition. Glucksberg regards metaphors as invitations to understand a topic (target) as a member of a category suggested by the vehicle (source). In *My lawyer is a snake*, for instance, the lawyer is to be considered a member of an *abstract* SNAKE category fittingly derived from the more literal SNAKE category. As befits the interactional viewpoint, the vehicle *snake* is also affected by the topic, because it interacts differently with *my lawyer* in *My lawyer is a snake* than it interacts for example with *this road* in *This road is a snake*.

Whether unidirectional or bidirectional, the initial definition is of course too general for our present purposes. It carries insufficient theoretical specificity and novelty to warrant an allegedly 'novel' cognitive-poetic approach to literary metaphor. Also, its generality—although already split between uni- and bidirectionality—sweeps cognitivist disputes under the rug. The challenge for CP is to create added value vis-à-vis existing noncognitive (or not explicitly cognitive) analyses of poetic metaphor, to attend to tensions, to make the specific aspects of cognitive metaphor theories relevant for interpreting literary texts, and, conversely, to let CP interpretations speak to cognitive science at large. The short summary of CMT in the next section briefly hints at poetics-related issues, which receive a fuller treatment in the section thereafter. The present chapter will then introduce other cognitive views on metaphor ('interaction', 'class inclusion', 'relevance', 'blending',

'bidirectionality') and attend to the importance of form, propose a template that combines ideas from all theories considered, and conclude by discussing these findings on metaphor in relation to the aims of (cognitive) poetics more generally. In the course of the argument, the chapter also intends to redress the reputation of Aristotle in matters of metaphor.

3.1 Conceptual Metaphor Theory and Aristotle

"Of the thousands and thousands of pages written about metaphor", says Eco (1983: 217–218), "few add anything of substance to the first two or three fundamental concepts stated by Aristotle", that is, in his treatises on poetics and rhetoric. Yet Aristotle is a culprit for modern analysts, especially cognitivists (e.g., Lakoff & Johnson 1980, 1999; Turner 1987: 9–21; Glucksberg 2001: 4–11). Aristotle famously—or notoriously—stated that metaphor is the transporting (*epiphora*) of an *onoma* (a 'noun', 'word', or 'expression') from one thing to another—as when someone transports *being on shaky ground* to *your theory*; or when I say that *Car fumes are slow stranglers* and thereby transport *slow stranglers* to *car fumes*; or when the Spanish poet Cernuda (1902–1963) transports *flowers*, *daggers*, *ribbons of water*, and *burns* to *bodies* when he writes that "Some bodies are like flowers/ others like daggers/ others like ribbons of water/ but all bodies, sooner or later/ will be burns growing bigger on other bodies" (1931; my translation).[3] Cognitivists usually take Aristotle to regard metaphor as little more than a substitution of nouns, a noun that replaces another noun—whereby the former noun sheds its habitual and proper literal meaning (e.g., someone who strangles slowly) to take on a new, figurative, improper meaning (e.g., something that chokes and eventually kills people). This is actually a reductionist version of Aristotle, produced by 19th-century French rhetoricians (on which see, e.g., Ricœur 1975), and obliquely yet effectively attacked by Black (1962). It is a framing of Aristotle that turned the founder of Western poetics into the putative father of an anticognitive fallacy, the substitution view of metaphor, as though he believed metaphor to be a sheer surface operation (Black 1962).[4]

The putative fallacy was picked up by Lakoff and Johnson (1980) and associates through CMT. Katz (2011: 484, original emphasis) summarizes their anti-Aristotelian argument as follows:

> Aristotle situated metaphor in the realm of language, a position that has been the basis for subsequent theories but has been contested since 1980 by theorists working within cognitive linguistics. Aristotle's basic premise is that with metaphor, one word (or expression) is *substituted* for another.

Against the linguistic substitution view, CMT argues "that metaphors are matters of thought and not merely of language" (Katz 2011: 485). Thus, the sentence *Your theory is on shaky ground* is the verbal instantiation—a linguistic surface realization—of something more substantial, namely the underlying conceptual metaphor THEORIES ARE BUILDINGS (the small capitals standardly signal concepts rather than linguistic expressions). In a conceptual metaphor, a category (i.e., concept) or conceptual domain (THEORIES) is understood in terms of another category or domain (BUILDINGS)—where *domain* stands for the conceptually structured field of experience associated with a particular concept (Lakoff & Johnson 1980: 117; Lakoff 1993).[5] In short, the CMT analysis of daily expressions shows that we talk, think, and live by conceptual metaphors, in which chunks of conceptual source structure (BUILDINGS) are "mapped" or "projected" onto the target (THEORIES).

There are further connections between Aristotle, Black (1962), and CMT. Aristotle suggested that metaphors often signal an analogy between things that are or seem dissimilar (Eco 1983: 234)—what Glucksberg (2008: 72) calls metaphor's paradox of "unlike things compared". Cognitive solutions to this paradox come in different varieties. Glucksberg (2008: 68) dissolves the paradox as he finds that "metaphors are rarely understood via comparison" (see below). According to Lakoff

and Johnson (1980: 148, 154), who were possibly inspired by Black (1962: 37), metaphor is not motivated by an "objective" degree of similarity between dissimilar entities, but metaphor instead *creates* similarity between dissimilar concepts by unidirectionally projecting an amount of conceptual structure from one to the other.[6] By recasting Black's proposal in unidirectional terms, CMT emphasizes the creative and constructivist power of conceptual metaphor in daily life, which connects with the etymological meaning of poetics—*poiein* [*ποιεῖν*], or "making". CMT notes furthermore that the unidirectional mapping of conceptual structure is only partial (or constrained), for if "the metaphorical structuring […] were total, one concept would actually *be* the other, not merely be understood in terms of it" (Lakoff & Johnson 1980: 13, original emphasis). Where Black spoke of interaction, CMT speaks of constraint: in CMT the target does not allow full restructuring by the source. For instance, in *Your theory is on shaky ground* or *This theory collapses*, "the parts of the concept BUILDING that are used to structure the concept THEORY are the foundation and the outer shell. The roof, internal rooms, staircases and hallways are parts of a building not used as part of the concept THEORY" (Lakoff & Johnson 1980: 52). This specific insight will prove relevant when Lakoff and Johnson discuss poetic metaphors.

In order to grasp the specificity of CMT, also with regard to poetic meaning, it is fundamental to keep in mind how Lakoff and Johnson conceive of concepts (categories). In our minds, a BUILDING is not just "a structure with a roof and walls, such as a house or factory" (*Oxford English Dictionary*), but an information-rich imagistic concept that condenses our experience of the many exemplars we have encountered. The imagistic concept was first described as a holistic but "indefinitely analyzable" Gestalt (Lakoff & Johnson 1980: 72), next also as an "image scheme" that integrates schematic information from multiple sensory sources and allows for embodied simulation (Johnson 1987; Hampe 2005: 1; Tendahl & Gibbs 2008: 1837), and as an "Idealized Cognitive Model" or ICM (Lakoff 1987) with purposive-interactional properties derived from our experience with exemplars of the category (e.g., with buildings).[7] Using James J. Gibson's (1979) terminology, we could add that the ICM of BUILDING includes its "affordances", the uses that buildings typically afford us. Concepts are therefore not sterile bundles of features—whether on equal footing or differentiated into necessary and sufficient ones—but "holistic" entities derived from and geared toward experience (Gibson 1979: 72). Furthermore, whereas people will find certain specific exemplars of buildings to be central (i.e., prototypical) for the category (e.g., HOUSE, APARTMENT BLOCK), others will be included only marginally, as we stretch the category (e.g., ROOFED BUS STOP), and still others will fall out of the category and be buildings in a metaphorical sense only (e.g., THEORIES). Finally, and conversely, many concepts (e.g., THEORIES) are metaphorically defined and understood, that is, defined and understood in terms of other concepts (e.g., BUILDINGS). According to Lakoff and Turner (1989: xi), these are the conceptual "tools" that the poet also works with. To apply Alber et al.'s (2018: 429) phrase, CMT pretends to describe part of the general "cognitive makeup" that verbal art "exploits".

Although metaphor creates similarity by projection, CMT also claims, as briefly mentioned, that metaphorical creativity always works under constraints—unconscious constraints, not like the self-imposed poetic constraints contrived by, for example, the Oulipo writers. This claim that similarity creation abides by specific principles of constraint is pitched against the "idealist", "subjectivist", or "Romantic" view that metaphor is a completely free and unrestrained process of imagination (Lakoff & Johnson 1980: 185, 228). The claim is that the constraints on conceptual projection are a function of the structure of our concepts. In an essay on daily and poetic metaphor, Turner (1990: 476) specifies one such constraint: the "image scheme" of the source concept—that is, its skeletal image as distilled from recurring patterns of experience (Tendahl & Gibbs 2008: 1836)—does not usually violate the target image scheme. In LIFE IS A JOURNEY, for instance, JOURNEY lends LIFE the image-schematic structure of a PATH, yet we do *not* infer from this that we can return in life—as we can often return when we walk on a path—because our image scheme for LIFE contradicts the walk-back option that the image scheme of PATH includes. Source image schemes

do not erase and replace incompatible target image schemes, Turner (1990) proposes. The potential poetic relevance of this so-called Invariance Principle (Turner 1990: 475) will be discussed below.

It would be hard to overstate, in explaining CMT, that metaphor is about *metaphorical structures in the mind*. Metaphor is cognitive for CMT in the sense that the mind works with systems of metaphors that are part of our conceptual system. To use or understand the verbal metaphor *Your theory is on shaky ground* is to activate or recognize an instance of the metaphoric mental structure THEORIES ARE BUILDINGS, which exists in the mind and is also activated in other verbal instances such as *The argument collapsed* or *The theory will stand or fall on the strength of that argument* (Lakoff & Johnson 1980: 46). Lakoff and Johnson (1980: 116) view such sentences as "data that can lead to general principles of understanding", involving "whole systems of concepts rather than individual words or individual concepts". Metaphors constitute a system of source-target mappings (e.g., THEORIES ARE BUILDINGS) that are part of the makeup of the human mind and find expression in language (for a critical discussion, see Tendahl & Gibbs 2008: 1835, 1841–1843). The linguistic surface expressions themselves, however, are often called "literal language"—or "idioms" at most—derived from conceptual metaphors in the mind (Lakoff & Johnson 1980: 46).

Although Lakoff and Johnson (1980) had little to say about poetic language, they did famously theorize why the structures of the mind are so pervasively metaphorical. In our embodied and interactive experience of the world, humans have certainly developed *literal* concepts for "simple spatial concepts", as when the concept UP "emerges from the collection of constantly performed motor functions having to do with our erect position relative to the gravitational field we live in" (ibid.: 56–57, 117). However, most other human experiences—for example, emotions and abstract ideas—are not so "sharply delineated" in our experience and are therefore metaphorically understood in terms of concepts that are more clearly delineated (ibid.: 58–59). Abstract concepts such as TIME, THEORIES, or LOVE are so hard to grasp that they "require metaphorical definition" (ibid.: 118). This is what CMT calls the *grounding* of concepts in physical and cultural experience (ibid.: 68). "Understanding […] requires a grounding in experience", and our categories "not only have emerged from our experience but are constantly being tested through ongoing successful function" (ibid.: 180). This connects, I would suggest, with the observation that literary texts use "creative metaphors" to capture the qualitative and often almost inexpressible properties of various experiences (Caracciolo 2016: 214 and references there).

The insight that metaphors "tend to be grounded in everyday experience" (Stockwell 2002: 31, 111) brings us to CMT's "directionality hypothesis" (Lakoff & Johnson 1980: 112), which specifies the unidirectional nature of metaphorical mapping. CMT hypothesizes that there is a propensity in cognition to use *concrete* concepts from daily experience, such as BUILDING, JOURNEY, WAR, SEEING, and UP, to metaphorically structure and understand more *abstract*, less tangible notions and domains, such as THEORY, LIFE, ARGUMENTS, UNDERSTANDING, and GOOD. The human mind is therefore structured by powerful conceptual metaphors such as THEORIES ARE BUILDINGS, LIFE IS A JOURNEY, ARGUMENTS ARE WAR, UNDERSTANDING IS SEEING, UP IS GOOD, and many more. Thus, LIFE IS A JOURNEY structures abstract time in terms of perceptible space, as exemplified by such linguistic expressions as *The future lies before us* and *We look back at the past* (see Hustvedt 2019: 29 for an explicit novelistic application of this conceptual metaphor). These are fully normal expressions, Lakoff and Johnson (1980: 56) point out, and hence metaphorical language is not deviant by default. Moreover, as research by Shen (2008 and references there) has shown, the concrete-to-abstract directionality of metaphor is also dominant in vast corpora of poems. Although this confirms a central hypothesis of CMT in the realm of poetry, its relevance for poetic analysis is open for discussion (see below).

Finally, CMT's grounded, experiential, and embodied view of metaphor suggests that the 'dead-alive' dichotomy of metaphors is inappropriate when it comes to evaluating the metaphoricity of an expression in the mind of an individual. Speakers who produce allegedly dead metaphors often

betray through their gestures that some aspects of the source domain are mentally triggered, that is, awake in their minds (Müller 2008). Metaphors that are allegedly dead are often 'dormant' at most, and dormant metaphors may have a degree of metaphoricity of which speakers are unaware. It is not inconceivable that such metaphoricity instills in the audience a minimal sense of poeticality below the threshold of consciousness.

3.2 CMT and Poetic Metaphor: Theory and Practice

The conclusion to draw from Lakoff and Johnson (1980) is that metaphorical thinking is ubiquitous in daily life, but not that daily life is therefore poetic. As Eco (1983: 247–251) reminds us, many metaphors are "trivial" rather than "poetic" or "good" or "open".

Whereas Lakoff and Johnson lay bare the pervasiveness of metaphorical thinking, their research is less helpful to understand *differences* between poetic and trivial metaphors (see also Jackendoff & Aaron 1991; Biebuyck & Martens 2011). Regarding this differential issue, it is unproductive and reductionist to state that literary metaphors are basically the same thing as metaphors in daily discourse—a linguistic surface realization of a conceptual structure. Lakoff and Johnson (1980) concede that some metaphors are more imaginative than others yet have trouble squaring this concession with their overall claim that metaphor is a quotidian thing, and that poetic metaphors are, to borrow Gleason's (2009: 437) skeptical phrase, mere "variations within the larger rule of metaphor". After conceding that language is indeed the medium of poetic metaphor, they insist that poetic metaphor is "not merely a matter of language" (Lakoff & Johnson 1980: 235). This is certainly true, but this CMT claim—once more a charge against the noncognitive strawman version of Aristotle—merely states that poetic metaphor is conceptual: this claim does not explain why poetic metaphor is poetic, nor does it show how poeticality squares with the basic CMT view that verbal metaphors instantiate conceptual metaphors.

Lakoff and Johnson (1980: 53) briefly address the differential issue, arguing that unusual ("imaginative") metaphors can differ from usual ("daily") ones in three possible manners: they are (i) "extensions of the used part" of the daily metaphor, as in *These facts are the bricks and mortar of my theory*, (ii) "instances of the unused part", as in *His theory has thousands of little rooms and long, winding corridors*, or (iii) a "novel metaphor" that is not part of our normal conceptual system, as in *Classical theories are patriarchs who father many children, most of whom fight incessantly*. Thus, although CMT demonstrates that metaphorical thinking is everywhere, it also suggests that the more imaginative metaphors *deviate* from the daily ones. They either extend the used parts of the source, or they use source parts not usually used, or they contrive new combinations.

Lakoff and Turner (1989), in a monograph dedicated to poetic metaphor, once more liken poetic metaphor to daily metaphor: "great poets, as master craftsmen, use basically the same tools we use" (xi). To the above-mentioned mechanisms of poetic metaphoricity, Lakoff and Turner (1989: 71) now add the poetic "formation of composite metaphors" and the "explicit commentary on the limitations of conceptual metaphors, and the offering of an alternative". Freeman (1995) argues in this vein that Emily Dickinson builds a poetic "conceptual universe" that rejects the Calvinist conceptual metaphor LIFE IS A JOURNEY THROUGH TIME, with heaven as its endpoint, and replaces it with the science-inspired LIFE IS A VOYAGE IN SPACE. Also, against the clichéd *Time heals all wounds*, Dickinson sets the novel metaphor "Time is a test of trouble,/ But not a remedy" (Freeman 1995). Lakoff and Turner focus furthermore on the role of mental imagery in poetic metaphors. In poetry, "image-schema metaphors" can map "very general structures, like bounded regions, paths, centers" onto a target: for example, Auden's *the crack in the tea-cup opens/ a lane to the land of the dead* maps the "path image-scheme" of a-crack-with-fluid-running-out onto the domain of life and death (Lakoff & Turner 1989: 98–99). However, daily metaphors also have the capacity to project source-concept imagery onto the target, as when in LIFE IS A JOURNEY the path image scheme of JOURNEY is mapped onto LIFE. So, where lies the difference between poetic and ordinary, if there is one?

Turner (1990) makes two observations in this regard. First, some creative metaphors link conceptual *domains far apart* yet do not strike us as weird because they respect the Invariance Principle. Thus, in the metaphor *Trees climb the hills toward the Golan and descend to test their resolve near the desert*, it may seem odd that "intentional animate agents are mapped onto plants", yet the mapping sounds natural enough because "the trace of a climb that crests and then descends has the same image schematic structure as the line of the trees" (Turner 1990: 468, 476). Second, Turner notes that poeticality can arise from violating the described principle, *if* we somehow manage to ascribe meaning to the violation (ibid.: 471, 473). By contrast, "if ultimately we find no significance in the violation, we will find the metaphoric invention either faulty or beyond our powers" (ibid.: 474). Again, then, Turner suggests that poetic metaphors *deviate* from daily metaphors in at least two ways: by bringing together remote domains that nonetheless have a similar image-schematic structure, and by violating the source image structure in a way that can be motivated by the reader. (Remarkably, readerly motivation after manifest rule violation is a primary poetic mechanism in theories that stress the *difference* between art and quotidian discourse; see Semino & Steen 2008: 233; Caracciolo 2016 and references there; see Stockwell 1999 for a general critique of the Invariance Hypothesis.) Finally, Lakoff and Turner (1989: 201) find imaginative poets to produce novel and striking "image-metaphors" that "map rich mental images onto other rich mental images", such as when Asian barefoot peasants working and stepping in muddy fields are described as wearing *chicken's pants*.

Rich is an epithet that Lakoff and Turner (1989: 20, 52) often apply to poetic metaphors—although not in an unequivocal manner. In one context, they adduce that our mental schemas for certain concepts, such as PLAY, are rich by themselves, which suggests that poeticality is based on their rich cognitive potential and the poet's ability to exploit that potential (Lakoff & Turner 1989: 61). Yet in the context of image metaphors, *rich* seems to signal the vivid, non-skeletal character of the imagery, as opposed to the above-mentioned metaphors based on skeletal *image schemes*.[8] Anyhow, CMT has done much to revitalize the topic of rich, vivid visual imagery in metaphor—which was downplayed by structuralism, poststructuralism, and New Criticism, including I. A. Richards (see Gleason 2009). It is a topic that also received attention from phenomenological scholars such as Wolfgang Iser, cognitive poeticians such as Tsur (e.g., 2009), and other scholars who recover "an earlier 'cognitive revolution' (informed by Gestalt psychology) in literary criticism" (Goodblatt & Glicksohn 2003: 210). In fact, the cognitivist focus on imagery reminds us of Aristotle (*Rhetoric* 1411b; see below).

The question now urges itself upon us: Is Aristotle's view of metaphor cognitive after all, although perhaps not in CMT's way? "The later periods of the metaphorological tradition", says Eco (1983: 232), "frequently ignore the most ingenious and vigorous of Aristotle's conclusions, that the metaphor is not only a means of delight but also, and above all, a tool of cognition".[9] Swiggers (1984), who like Eco refers to the original Greek text, equally argues that "metaphor always involves a cognitive act" in Aristotle's theory. On the side of the speaker, "making good metaphor means to have an eye for resemblances", which is an act of recognition and "a sign of genius" (*Poetics* 1459a 5–8, among other passages translated by Swiggers 1984: 44). In Swiggers's (ibid.: 44–45) paraphrase of Aristotle, "Homer owed his popularity to the fact that he, by his brilliant use of metaphors, could speak about inanimate things as if they were alive" so that metaphorically worded reality is—in Aristotle's words—"[set] before the eyes" of the hearer ("πρὸ ομμάτων"; in *Rhetoric* 1411b; see also Eco 1983: 234).

Lakoff and Johnson (1980: 190) only briefly acknowledge Aristotle's "praise of metaphor's ability to induce insight", yet the Aristotelian argument does resonate with other cognitivists—for example, Freeman's (2009) proposal that poetic metaphor can produce a "semblance of felt life", quoting Susanne Langer's phrase and also referring to Henry James's "sense of felt life". It is more than legitimate for CP to ask if literary metaphors can be exceptionally imaginative in some

specifiable way (cf. Freeman 2011) and to what extent such metaphors remain chiefly instantiations of the larger rule of metaphor, that is, surface realizations of cross-conceptual structures already present in the mind. It is legitimate for CP to focus not on sameness but on differences between imaginative and trivial metaphors. Even Giora's (2008) iconoclastic question—"Is metaphor unique?" (to which her answer is "no")—implies among other things that many metaphors are as unpoetic as literal language, and that only certain metaphors qualify as poetic, under conditions that can be fulfilled by non-metaphors too.[10]

Lakoff and Johnson (1999: 123) link their general critique of Aristotle to a difference in accepted corpora: "Aristotle was also mistaken about metaphorical language being only poetic and rhetorical in nature and not part of ordinary everyday language". Again, however, the anti-Aristotelian charge and its novelty claim are not unproblematic. First, Lakoff and Johnson once again attack a strawman version of Aristotle: Eco's (1983: 234) reading shows that metaphor is "not an ornament" for the Greek philosopher. Second, Aristotle does make reference to the potentially creative role of metaphor outside the realm of poetry. Third, Lakoff and Johnson were certainly not the first to note metaphor's pervasiveness outside poetry. In 1730 the French grammarian DuMarsais had written for example that more tropes were undoubtedly used in one day at the Parisian food market Les Halles than in several consecutive sessions of the Académie française (quoted in Fontanier 1830/ 1968: 157). Regarding corpora, the greater novelty of CMT lies rather in its sustained and systematic scrutiny of ordinary language metaphors.

Before briefly testing out CMT on poetry, one last issue should now be raised regarding the relevance of CMT for poetics: Is directionality a relevant criterion to tackle and understand the poetic quality of the metaphor? As said, Shen (2008) demonstrated that concrete-to-abstract metaphors are majoritarian in poetic texts too, which is interesting for the validation of CMT, yet does it have value for literary analysis? It is exceedingly easy to come up with poetic metaphors that exhibit all kinds of directionality—not just concrete-to-abstract, such as *the empty house of my memory* in a 1970 poem by the Belgian-Flemish poet Paul Snoek (Snoek et al. 1971), but also abstract-to-concrete, such as the metaphor in Nick Cave's 2013 song title "Push the Sky Away" (which is bound to be less experiential than what it applies to), abstract-to-abstract, such as Shakespeare's *Life is a tale told by an idiot*, or concrete-to-concrete, such as Borges's (1921) avant-garde imagistic metaphor *With a rifle on their shoulder, trams/ patrol the avenues* (quoted in López Alonso 1994: 9) or Cernuda's more hermetic *bodies will be burns on other bodies*. Poeticality is not attached to directionality per se (Stockwell 1999), although some directions may be associated with certain schools (Semino & Steen 2008: 239). Thus, Gleason (2009: 440, 445) notes that concrete-to-concrete image metaphors abound in the poetry of the Imagists, such as Lowell's "If I throw a stone into the placid water/ It suddenly stiffens/ Into rings and rings/ Of sharp gold wire" (see also Crisp 1996).

Although CMT is mostly interested in verbal metaphors as gateways to understanding cognition, and less as literary devices, Stockwell (2002)—the first major textbook of CP—argues that CMT has relevance for literary studies, thus appearing less critical than he was in a previous article (Stockwell 1999). The poetic metaphors analyzed by Stockwell are scintillating, albeit for reasons not obviously linked to CMT's core ideas. He quotes, for instance, David Gascoyne's poetry lines *there is an explosion of geraniums in the ballroom of the hotel*/ […]/ *her arms are like pieces of sandpaper*/ *or wings of leprous birds in taxis*. The hallmarks of CMT—concrete-to-abstract directionality and the recurrence of conceptual metaphors—are absent, and hence cannot explain why these lines are remarkable or poetically pleasing. What we find, rather, is an accumulation of concrete-to-concrete mappings (*explosion of geraniums*, *arms like pieces of sandpaper*) as well as estranging metaphorical processes—ranging from the somewhat defamiliarizing *explosion of geraniums* to the more estranging *arms like pieces of sandpaper* and the very bizarre *[arms] like wings of leprous birds in taxis*. These are novel metaphors, not instances of conceptual ones. In fact, this is more or less what Stockwell (1999: 136) proposes in his earlier, excellent paper that called

into question the Invariance Hypothesis and instead turned to the view of literary metaphor inspired by I. A. Richards (discussed below).

More positively, CMT might tell us that the concept EXPLOSION is an Idealized Cognitive Model (ICM) that projects some of its image-schematic structure (a sudden, rapid, violent, and centrifugal expansion that leaves damage) on how we should imagine the presence of geraniums in the ballroom. Likewise, the concept of SANDPAPER may be said to activate an ICM that projects some of its experiential meaning (its imaginable rough-texturedness, inflexibility, and short life) onto the skin of her arms. Stockwell (2002: 112–114) indeed suggests that the geranium-explosion metaphor is poetic because it produces peculiar mental imagery, "an image of incendiary petals scattered deep across the floor of the devastated hotel ballroom". However, other poetic metaphors in Gascoyne's poem are so deeply defamiliarizing, so non-ordinary, that even fanciful mental imagery cannot easily resolve them into something meaningful: *arms like wings of leprous birds in taxis* seems even more hermetic—less imaginable—than Cernuda's *bodies are burns growing bigger on other bodies*.[11]

There are, perhaps, more likely candidates for poetic analysis along CMT's lines—such as the following poem by Jaime Gil de Biedma (1929–1990):

I will never be young again

That life was for real
one begins to understand later
—like all young people, I came
to have the world at my feet.

To leave a mark I wanted
and leave amid applause
—aging, dying, were only
the dimensions of the theater.

But time has passed
And an unpleasant truth shows up:
aging and dying
is the one plot of the play.

Gil de Biedma 1968; translated from the Spanish by Cleanthess 2013, here with minor emendations

From CMT's perspective, we note the metaphors "aging, dying, were only the dimensions of the theater" (at the end of the second stanza) and "aging and dying is the one plot of the play" (at the end of the poem), which might both be considered instantiations of the conceptual metaphor LIFE IS A THEATER PLAY (also known as the *theatrum mundi* metaphor). The metaphor appears throughout history in many texts and interpretive contexts. In a platonic interpretation, the theatrical may stand for the unauthentic, superficial, and ephemeral quality of life. Shakespeare has eternalized a version of the metaphor ("All the world's a stage, And all the men and women merely players"), Baroque writers such as the famous Dutch playwright Vondel picked it up, and in modern times Goffman masterfully explored its social ramifications in *The Presentation of Self in Everyday Life* (1969). People may recur to it for detached reflection on life, which is often 'little more than' theater, or even to deflect responsibility for the 'role' they merely 'play' because they have to. Lakoff and Turner (1989: 20–22) discuss the productivity of LIFE IS A PLAY in daily expression such as *It's curtains for him*, *She always wants to be in the spotlight*, and *He saved the show*, which indicate

the semantic "richness" of our PLAY schema. Stockwell (2002: 110) equally lists LIFE IS A STAGEPLAY among a series of "powerful conceptual metaphors".

Yet the differential question pops up again. If the metaphor is so pervasive and productive in ordinary life, then why do Gil de Biedma's instantiations of the metaphor still strike many readers as poetic and moving and non-ordinary? To be sure, the mere recalling of a familiar metaphorical truth about life can always be meaningful. However, it seems upon closer inspection that an instance of *defamiliarization* plays a significant part in the poetic quality of the poem. As we shall now see, inspired by Tsur's (2009) use of Gestalt theory, the poem's metaphors operate a defamiliarizing 'figure-ground reversal', or at least a radical reconfiguration of figure and ground.

Gestalt psychology (see, e.g., Ellis 1938) argues that in visual perception—and by extension other cognitive domains—the human mind continuously identifies figures against grounds, where figures are perceived as self-contained objects, entities in focus, emerging from a (back)ground that remains out of focus (see also Stockwell 2002: 15). Tsur, a strong proponent of Gestalt psychology in poetics, discusses a case relevant to our discussion. We tend to focus, says Tsur (2009), on our own life as a figure against a ground of non-life—that is, as the significant figure against the reassuringly backgrounded time before our birth and especially after our death. Tsur shows how this usual figure-ground organization is reversed or reconfigured in a metaphor by Sir Philip Sidney "this small course which birth draws out to death". This small course, visualizable as a short line, arouses "emotional disorientation", says Tsur, because "in a world in which 'God is dead,' there is nothing beyond", and "what is in between is meaningless and negligible". The poem's figure of life, a short course from birth to death, has impact because "the shorter the connection, the more meaningless life becomes" (Tsur 2009: 271).

Something similar seems to happen in Gil de Biedma's poem. To be sure, the ordinary view of life is first activated—although also relegated to the past—by the first mention of the metaphor ("aging, dying, were only the dimensions of the theater"); which goes to show that the dimensions of a theater (i.e., death) are backgrounded as soon as the play is being staged (i.e., as soon as my life begins). However, the second instantiation and closing line of the poem—note the iconicity between the textual end and life's end—prompts a reversal of the habitual and reassuring figure-ground organization: "aging and dying are the only plot of life". If Sidney saw life as a short course drawn from birth to death, Gil de Biedma sees aging and death as the only story elements of life. In both cases, we can make perfect sense of the defamiliarizing organization—*life as the short stretch between birth and death*, *aging and dying as the only plot of life*—yet this understanding involves picturing the smallness of life against an endless ground of nothingness.

We could add more complexity to the analysis, yet this should suffice to show that figure-ground reversal and defamiliarization throw more light on the metaphor's poeticality than certain CMT ideas might. Sure enough, a powerful conceptual metaphor is instantiated, yet this happens all the time in ordinary life. True, mental imagery plays a meaningful role, but Tsur's Gestalt analysis does not deny this. Furthermore, the directionality of "aging and dying is the plot" (abstract-to-concrete) and the Invariance Hypothesis (regarding potential constraints on image-schematic projection) seem largely irrelevant here. Finally, the "plot of the play" is *not* a "usually unused" part of source domain play, nor is it true that the source and target domains lie "far apart", precisely because the powerful conceptual metaphor brought them together ages ago. Rather, a cognitive analysis brings out a defamiliarization that is poetically and emotionally meaningful.

4.3 Challenging CMT (1): Lessons from Richards, Black, and Glucksberg

Lakoff and Johnson (1999: 122) accused Aristotle of being a "literalist", someone who believes that metaphor is reducible to literal paraphrase. The idea of metaphor's exhaustive literal paraphrasibility is problematic, says Ricœur (1975), because it turns metaphor into something formal and superficial—mere shorthand at best, or ornament at worst. As said, however, the

ornamental view does not belong to Aristotle but to 19th-century interpretations (Ricœur 1975: 66) and was superseded by early 20th-century literary analysis in the United States. Inspired by Gestalt psychology and Coleridge, the New Critic I. A. Richards (1936) proposed an account of metaphor that shifted the analysis to topic-vehicle interaction and to the sentence or discourse that embeds the metaphor (Ricœur 1975: 102, 106, 109; also Goodblatt & Glicksohn 2003, 2017; Danesi 2017). Richards adduced that the simultaneous presence and interaction of tenor (i.e., topic or theme) and vehicle (i.e., source) produces the meaning of the metaphor (Ricœur 1975: 106), so that "*both* terms affect the meaning of the other" (Gibbs 1994: 238, original emphasis).

Richards inspired Black's (1962) interaction theory of metaphor, which further inspired Goodman (e.g., 1976), Goodblatt and Glicksohn (e.g., 2003, 2017; Glicksohn & Goodblatt 1993), and the psycholinguist Glucksberg (e.g., 2001). Whereas Glucksberg develops a cognitive theory that deals with understanding metaphor in ordinary sentences (e.g., Glucksberg 2001: v), Goodblatt and Glicksohn (2017) focus on bidirectionality as it unfolds in poetry reading. Goodblatt and Glicksohn (2003: 213) note that Interaction Theory is largely ignored and even subjected to "misrepresentation […] by George Lakoff and Mark Turner (1989)". Furthermore, they criticize CMT's non-interactional, "unidirectional" view of metaphor, with its conceptual mappings from the concrete to the abstract, and find more to praise in Blending Theory (BT), with its interactional, "bidirectional" approach—to which we turn after a short discussion of Baudelaire in relation to Glucksberg (next section) and Relevance Theory (RT; section thereafter). Glucksberg (2001), we will see, is mostly an interaction theory of metaphor in the sense that he radicalizes and specifies Black's attack on comparison theories, which is Glucksberg's way to (dis)solve the paradox of "unlike things compared". Metaphors are not usually comparisons, Glucksberg claims.

In *The Flowers of Evil*, Baudelaire ends his poem "The Cover" (French *Le couvercle*) on the following lines: "The Sky! black cover of the great cauldron/ In which boils vast, imperceptible Humanity" (the translation is William Aggeler's; Baudelaire's *marmite* is a cooking pot, not necessarily a cauldron). In one type of reading—as in the BA-level French poetry class I took in 1990–1990—these lines compare the situation of "humanity on earth beneath the sky" to "whatever is boiling in a great cooking pot under a black lid" (*couvercle* in French). On this traditional view, exemplified for example by Groupe μ's famous *Rhétorique générale* (1970, see Figure 27.1 below), a metaphor is a comparison that prompts the reader to identify a *tertium comparationis*—the common ground between the two terms of the comparison (the intersection in Figure 27.1). Thus, in the poetry class, to understand the last lines of "The Cover" was to find the common ground or common semantic features (standardly expressed by nouns) of humanity finding itself beneath the sky, on the one hand, and an entity finding itself boiling in a great cooking pot under a black lid, on the other.

However obvious this interpretive procedure might seem, there is something puzzling about it. The diagram and the insistence on two intersecting terms suggest *symmetry* and even

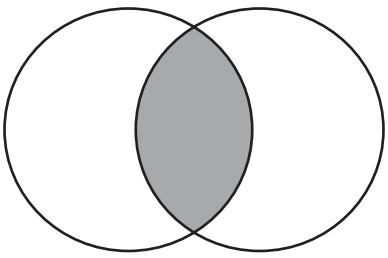


Figure 27.1 Tertium comparationis
Source: After Groupe μ's figure 12 in *Rhétorique générale* (1970/1982: 107).

reversibility: the suggestion is that if A compares to B for sharing (at least) feature T, then that same shared feature T should make B comparable to A. However, it is clear that Baudelaire's poem compares humanity's condition on earth to being boiled in a cauldron (he compares A to B) but does *not* compare being boiled in a cauldron to humanity on earth (he does not compare B to A). This refutes the traditional comparison analysis, including the "standard pragmatic model" of metaphor understanding developed by Grice (1975) and Searle (1979) (Glucksberg 2008: 67–68). According to this traditional model, a metaphorical statement is an anomaly when interpreted literally and is therefore reinterpreted (resolved) as a comparison that prompts us to find a common ground for the terms compared—*quod non*, according to Glucksberg.[12]

Glucksberg argues that asymmetry and irreversibility are left unexplained by comparison views but elegantly explained by his "class inclusion view". On this view, *My surgeon is a butcher* and *My accountant is a spreadsheet* are metaphorical class inclusion statements that assign the topic (*surgeon*; *accountant*) to a class signaled by the vehicle (*butcher*; *spreadsheet*). Unlike comparisons, class inclusion statements are always irreversible, irrespective of their metaphorical or literal nature. A literal class inclusion assertion such as *A tree is a plant* is not reversible to *A plant is a tree* (Glucksberg 2008: 44). Likewise, metaphorical class inclusion statements such as *My surgeon is a butcher* and *My lawyer is a shark* are not reversible to *My butcher is a surgeon* (which has a different meaning) and *My shark is a lawyer* (which is absurd). Class inclusion statements are metaphorical, according to Glucksberg (2001: 41 and ch. 3), if inclusion requires us to turn the vehicle (e.g., *shark*) into a superordinate class (a "metaphorical shark") with characteristics that are selected ad hoc with two criteria in mind: they should (i) be prototypically exemplified by the basic class (a literal shark) and (ii) relevantly apply to the topic at hand. We may add that non-reversibility also applies to metaphors that do not take the assertive form 'A is B': it would be weird to interpret Baudelaire's *cooking of Humanity* as the *Humanity of cooking*.

It now becomes apparent why Glucksberg considers his theory akin to Black (1962), which framed and attacked the substitution views and comparison views. The speaker instructs the audience to work out the details of a conceptual interaction: allow the vehicle (source) to conceptually reorganize the topic (target) yet accept the topic to be decisive in selecting the vehicle's relevant features for this conceptual organization. However, there is also something 'unidirectional' in Glucksberg's theory, namely the notion of statement or assertion or predication. In communicative terms, predication or assertion (A is B) is generally unidirectional, not reversible; and metaphorical communication is (class inclusion) assertion: a metaphor asserts that a given topic (*my lawyer*) is to be included in an abstract category (a "superordinate class") of which the explicitly mentioned literal category (*sharks*) is purported to be a prototypical member. Therefore, when predication or assertion plants a metaphorical process in the mind of the audience, predicative unidirectionality (non-reversibility) comes along—although this may be countered (as we will see).

4.4 Challenging CMT (2): Relevance Theory

Although Glucksberg and RT explicitly focus on metaphors in ordinary language, much like CMT, they are nonetheless unlike CMT because (i) they do not stress the omnipresent framing power of metaphor and (ii) they are mainly interested in cognition to the extent that it explains verbal communication, whereas CMT is mainly interested in verbal metaphor to the extent that it sheds light on the makeup of the mind.[13] "Many metaphors scholars", write Tendahl and Gibbs (2008: 1824; cf. Semino & Steen 2008: 237), "see [CL and RT] as being radically different". However, because CP tends to view literature as a form of communication (for debate see, e.g., Pilkington 2000; Herman 2008; Levinson 2010; Abbott 2011), the communicative approach of RT cannot be dismissed, even though its proponents have only shown limited interest in literary metaphor.

An important link between Glucksberg and RT is Gricean pragmatic theory. Glucksberg (2001: 47), for his part, agrees with H. P. Grice on one important issue: both metaphor and non-metaphor have communicative purposes "consistent with Grice's cooperative principle", which says that "utterances are assumed to be relevant and informative". Thus,

> a positive class-inclusion assertion [e.g., *Man is a wolf*] places a topic of interest into a *relevant* category and, by so doing, attributes one or more diagnostic properties to that topic. Similarly, a negative class-inclusion assertion [e.g., *People are not sheep*] excludes a topic of interest from a *potentially relevant* category and so denies that the topic has certain characteristics.
>
> *Glucksberg 2001: 47, my emphasis*[14]

As is well known, Grice defined assumed relevance as one of the basic coordinating principles of conversational communication. Hearers expect an utterance to be relevant and they expect that speakers know that hearers have such expectations of relevance. If relevance is an important concept for Glucksberg (following Grice), it is *the* key concept of Relevance Theory—in a drastically modified form (Sperber & Wilson 1986, explained below). Moreover, unlike Glucksberg, RT applies relevance not only to topic-vehicle interaction but to communication at large, communicative context eminently included.

The importance of context for relevance-theoretic metaphor analysis is evident in sentences such as *Caroline is a princess*, of which Wilson and Carston (2008: 11) point out—in pragmatic fashion—that its literal or metaphorical meaning entirely depends on context. If Caroline is actually a royal, the assertion suggests contextual relevance in its literal interpretation. In another context, however, the assertion may gain relevance in a metaphorical interpretation of *princess*:

> A (friend of B): "Will Caroline help us clear up the flood damage?"
>
> B (Caroline's older sister, like Caroline manifestly not of royal descent): "Caroline is a princess."

Not only does the topic *Caroline*, as a proper noun, require context (i.e., a specific referent) to acquire its meaning and possibly exclude a literal interpretation of *princess*, but A's question is also a helpful context for A to infer the specific metaphorical interpretation of B's answer: A understands that B implies, by metaphor, that Caroline will *not* help because she may be "spoiled", "indulged" (Wilson & Carston 2008: 10), and not generally inclined to carry out dirty and large-scale cleaning jobs. The example illustrates furthermore why RT "deflates" metaphor understanding, by likening it to, or finding it "continuous with", literal understanding—a position that RT calls "the continuity view" (Wilson & Carston 2008: 4, 8, 19) or "the deflationary account" (Sperber & Wilson 2008). Indeed, in a context where Caroline *is* an actual princess, A will equally need to understand the literal *princess* in a way that turns B's assertion into a relevant answer to her question.[15] The contextual search for relevance always steers the specific interpretation of a lexical item. In this section I will succinctly present the core ideas of RT (Sperber & Wilson 1986) and relate them to a poetic metaphor taken from a novel by Siri Hustvedt (2019). In the next section I will also briefly compare RT and Blending Theory with regard to Baudelaire's "The Cover".

In line with cognitive science (Sperber & Wilson 1986: 24), RT considers that *intentions* and the *recognition* of intentions are crucial in communication: "As speakers, we intend our hearers to recognise our intention to inform them of some state of affairs. As hearers, we try to recognize what it is that the speaker intends to inform us of" (ibid.: 23). For example, when a boy and his mother are in the kitchen and he says, "The amount of flies in here!", after which his mother points to the wide-open window, RT will argue that the mother, as a hearer, inferred the boy's intention

to communicate something (probably that he finds the flies annoying), and that she in turn intends him to infer her intention to communicate a potential cause, and possibly to recognize her intention that he close the window or recognize her intention to blame him for the cause of the problem (the example is mine). Before we can move to Hustvedt's novelistic metaphor use, we need to explain how RT deals with gestural communication, ordinary literal conversation, and metaphors in ordinary conversation.

The mother's pointing finger illustrates that communication can succeed in the absence of coded verbal material as long as *a recognition of intentions is inferred*—what Sperber and Wilson (1986: 25) consider "Grice's greatest originality". The main thesis of RT is that verbal communication—like all "ostensive behavior", such as pointing your finger somewhere—always carries the guarantee of relevance (ibid.: 49–50), that is, it holds the promise to yield meaningful "cognitive effects" when processed by the hearer (Wilson & Carston 2008: 88).[16] This is the communicative principle of relevance. If the speaker can ascertain with his or her behavior that the hearer recognizes the speaker's intention to *communicate* something (i.e., "the communicative intention"), then the speaker knows that the hearer will try to infer some *specific* intended information (i.e., "the informative intention"). As soon as it is manifest on the side of the hearer *that* communication is intended, an expectation of relevance is produced in the hearer, who will assume to have figured out *what* was intended to be communicated as soon as the expectation of relevance is satisfied.

The "comprehension heuristic" toward finding relevance for an utterance is seen as an automatic inferential procedure that follows the path of least effort. Specifically, the explicit content of the sentence, the "cognitive context" (i.e., whatever is contextually manifest), and the possible contextual implications are "mutually adjusted" by the hearer or reader "so as to make the utterance relevant" (Wilson & Carston 2008: 22–23).[17] To the boy and his mother, for instance, it is mutually manifest that they are in the kitchen and that they are alone in the kitchen—which should help her understand *that* he intends to communicate something (relevant) to her. In order to satisfy the expectation of relevance, she will need to supplement the explicit form of the utterance (*The amount of flies in here!*) by combining "explicatures" (i.e., contextually given referential values: *[he signals] an amount of flies here [in the kitchen]*) with certain "implicatures" (if the explicit content and the explicatures are insufficient to reach relevance). Implicatures are assumptions (implicit premises and conclusions) that usually need to be inferred and posited for the sentence to become relevant (e.g., the boy's potential implicature that he wants it to be manifest to her that he is not happy with the flies, and possibly his request to do something about the situation). Implicatures are omnipresent because very few utterances have a sentential structure that is entirely explicit about the intended relevance (cf. the eccentricity of the explicitly relevant *Mom, I want to communicate to you that I notice a large amount of flies here in the kitchen, and that this situation bothers me, and that I would like you to do something about it*).

Implicatures have varying degrees of necessity in the search for relevance—they can be very strong, or strong, or rather weaker. Very strong implicatures (i.e., very strongly implied premises and conclusions) are those that *must* be supplied for the communication to be relevant. Strong implicatures are "those premises and conclusions […] which the hearer is strongly encouraged but not actually forced to supply" in order to produce relevance (Sperber & Wilson 1986: 199). Weaker implicatures need not be supplied but do produce relevance when supplied. The boy's possibly implied expression of unhappiness is a very strong implicature (quite necessary to ascribe relevance to the utterance), his possibly implied request to solve the situation is relatively strong: it adds relevance and builds on the previous implicature, yet is not strictly necessary.

We may now connect this general theoretical framework to metaphor, including poetic metaphor. As part of the mutual adjustment between communicative context and explicit sentence meaning, the hearer's mind often starts inferential processes that narrow down or broaden the meaning of lexical

constructions for the sake of relevance—a viewpoint akin to Glucksberg's analysis that metaphors prompt for the construction of ad hoc concepts (Pilkington 2000: 95–100; also Barsalou 2011). Such an adjustment is not blatant in the boy's utterance (although *amount* needs to be mentally adjusted to *large amount*), but many literal utterances clearly require conceptual adjustment. For instance, in "A: She gave a very weird speech. B: She drinks too much", the verb *drinking* is narrowed down to 'drinking alcohol' for the sake of relevance (cf. Wilson & Carston 2008). The verb *drinking*, says RT, is here used in a somewhat loose way. Now, as for metaphors (e.g., *Caroline is a princess*), RT analyzes that they are also essentially a form of loose talk. Both the literal DRINK and the metaphorical PRINCESS are semantically adjusted ad hoc interpretations of the word (see Sperber & Wilson 2008: 90–95; also Pilkington 2000: 92). Metaphor interpretation typically involves "a combination of broadening and narrowing", as when the metaphorical princess "is broader than the encoded concept in some respects (since it applies to some people who are not actually princesses), and narrower than others (since it applies only to people […] who are spoiled, indulged (etc.)" (Wilson & Carston 2008: 10). Metaphor is thus shown to be an interesting *variety* of loose talk not essentially different from—that is, basically continuous with—more literal forms of loose talk.[18]

Next to the communicative principle of relevance (the promised guarantee of relevance), there is a cognitive principle of relevance, which theorizes how the hearer assesses the communication's degree of relevance: the greater the cognitive effects and the smaller the effort to reach these cognitive effects, the higher the estimated relevance of the communication (Sperber & Wilson 1986: 125). This cognitive principle is also known as the minimax principle. Because "human cognition tends to be geared to the maximization of relevance", the audience will stop the interpretive work as soon as a degree of relevance is reached, which usually happens very quickly in ordinary conversation: "the correct interpretation of an ostensive stimulus is the first accessible interpretation consistent with the principle of relevance" (ibid.: 178).

Is this deflationary or continuity view, with its emphasis on conceptual adjustment and the minimax search for relevance in context, applicable to literary cases? In the novel *Memories of the Future* (Hustvedt 2019: 37), the 62-year-old female narrator offers a damning description of a certain Aaron Blinderman, a young man whom the narrator briefly met when she was also young, whom she now only vaguely remembers, and who became "conflated in my mind to become one, one sort of man I encountered again and again, a man, younger or older, whose eyes continually strayed from my face to parts below, a man who talked and talked and talked and asked me no questions". The narrator speaks of a "reduction of many men into one man", and next asserts that "Sometimes memory is a knife". At this point, *knife* can be made contextually relevant by adjusting the KNIFE concept ad hoc, so that it means *something that cuts away, that reduces, and therefore is useful*, and perhaps by adjusting the concept to mean *something harmful, something that causes much pain, in a sudden way* (as when bad memories pop up). This metaphor is ambivalent at this point, although the rest of the narration will drive interpretation away from the knife as useful reduction, and towards pain—which shows the role of the evolving context and the evolution of metaphorical interpretation during reading. Metaphor interpretation in narrative is indeed a fluctuating process, a function of reader-narrative interaction (cf. the literary research of Biebuyck & Martens 2011 and references there).

Importantly, Sperber and Wilson (1986: 224) note that "poetic effects […] result from the accessing of a large array of very weak implicatures in the otherwise ordinary pursuit of relevance". Hence, "the richer and more creative the metaphor, the wider the range of weak implicatures. By contrast, the narrower and stronger the range of implicatures the more conventional the metaphor" (Pilkington 2000: 100). Hustvedt's "Sometimes memory is a knife" does not unequivocally satisfy relevance expectations when it first appears on page 37 of the novel. It requires reflection and permits several relatively weak—and even contradictory—implicatures that increasingly provide degrees of relevance. To be noted, here, is that the author renders the utterance as a conspicuous

one-sentence paragraph—a formal highlighting device that suggests importance and further invites the reader to reflect, as against the minimax principle.

This alerts us to a first weakness of RT in matters of poetic metaphor—the fact that the minimax principle of relevance applies far more obviously to ordinary conversation than to literary texts. As Sullivan (2007: 441) notes, "conversation […] is constrained by concerns of clarity and brevity (as summarized by, for example, the Gricean Maxims)", whereas "many poetic genres are not constrained in the same way". Even more than narrative fiction, where metaphor interpretation can sometimes be quick and story-driven, poetry is a genre that by definition suggests a 'maximax' approach, a processing that is leisurely and not time-limited (cf. also Steen 1994: 100; Semino & Steen 2008: 243). Despite RT's emphasis on the role of context, the powerful context of genre is sidelined or only marginally acknowledged in RT publications (e.g., Pilkington 2000: 16, 103–105).

A second weakness regarding poetic metaphor is that RT, as a pragmatic theory, does not focus on semantics, conceptual structures, and novel conceptualizations. Its main point is precisely to theorize the gap between semantic meaning and the speaker's meaning, and to explain how speakers and hearers bridge that gap continuously.[19] But as for example Deacon (1997) forcefully argues, creative categorial thinking is the great strength of human thinking. When a stimulus is categorized, it is no longer a stimulus prompting an automatic Pavlovian response but a category with many intercategorial relations, which are often discovered through "learning by insight" and rearranged through a mental "restructuring event" (ibid.: 93). Although from a different philosophical perspective, Goodman (1976: 69) sees metaphor precisely as a reassignment of a "label" (or "predicate") with a past (i.e., with a habitual meaning attached to it) to "an object that yields while protesting"—and the breaking of the habits of predication is what turns metaphor into a fundamental cognitive tool for knowledge production and "worldmaking". For RT, by contrast, a metaphor is mainly a local adjustment of a "lexical entry"—a process not geared toward creative understanding but toward efficient and quick communication. Metaphorical understanding in daily life (i.e., the resolution of categorial difference) strips the relevance of the source category to the bare minimum (PRINCESS comes down to *spoiled*), whereas metaphorical understanding in poetry may invite readers to maximally exploit or "run" the ICMs and find relevance precisely in finding analogical correspondences (cf. Steen 2009; see also on Blending Theory below). Mutual understanding in conversation requires speedy interpretation whereas conceptual rearrangement or derangement—as in poetic or scientific discourse—may require much processing time. Literary reading is free from the pressures of conversational interpretation, which makes poetic metaphors a pleasurable form of learning by intercategorial insight—perhaps somewhat in the way narrative fiction is a pleasurable training of our Theory of Mind capacities (Zunshine 2006).

RT's third weakness in matters of poetic metaphor is that it has tended to reduce cognition to a propositional format—to thoughts considered as propositions—which is a view of the human mind that downplays mental imagery (Pilkington 2000: 164ff; Green 2017; Banks 2018; and infra; but see Wilson & Carston 2019 for nuance). By contrast, Lakoff was among the first to argue that cognition is embodied, that is, modal, sensory, and imagistic. As a former student of Chomsky, Deirdre Wilson passes on Chomsky's Cartesian view of the disembodied mind, whereas Lakoff, although also a former student of Chomsky, has relentlessly attacked Descartes's mind-body dualism, that is, the idea that the mind is an entity separate from the body. Regarding poetic metaphor, Gibbs and Bogdonovich (1999) have shown for example that imagery activation can play a much larger role than propositional knowledge when readers are asked to make sense of image metaphors (*in casu* André Breton's poem "Free Union"). Because imagery activates emotion circuits in the brain (Holmes & Mathews 2010; Hogan 2011: 46), the embodied focus on imagery is poetically all the more relevant in a field that often ignores emotions (as argued by, e.g., Freeman 2012; but see work by Gibbs, e.g., 2002a, 2002b, on metaphor and feeling).[20]

4.5 Contenders or Collaborators? Blending Theory and Bidirectionality Theory

After collaboration with Lakoff on a CMT approach to poetic metaphor (Lakoff & Turner 1989), Turner teamed up with Fauconnier from the mid-1990s onward. The framework they developed, Blending Theory (Fauconnier & Turner 2002), has greater interest than RT in poetic metaphors (see, e.g., Turner & Fauconnier 1999). However, whereas CMT exclusively focuses on metaphor, Blending Theory (BT) sees metaphor as only one—admittedly central—case of the creative mechanism called 'blending' or 'conceptual integration', as succinctly explained below.

Whereas CMT analyzes metaphor as "entrenched conceptual relationships" "presumably stored as a knowledge structure in long-term memory" (Grady et al. 1999: 101; and supra), BT analyzes metaphor as meaning that is creatively produced on the fly ("online" in BT terminology). The online blending process does "recruit" mental associations "entrenched" (i.e., stored) in long-term memory—such as frames, ICMs, and entrenched conceptual mappings (Grady et al. 1999; Fauconnier 2007: 352, 355). This focus on process broadly connects BT with poetic theories that strongly emphasize the *processual* nature of reading poetry (Freeman 2002: 43; Goodblatt & Glicksohn 2003) or literary reading more generally (Sternberg 2009: 456). Thus, whereas CMT sees metaphors as entrenched *unidirectional* mappings between two conceptual domains, BT sees metaphorical blends as dynamically evolving meaning constructions describable by a many-directional "four-space model" (Grady et al. 1999: 103)—where a *space* is "a partial and temporary representational structure" (ibid.: 102) "built up dynamically in working memory […] as we think and talk for purposes of local understanding and action" (Fauconnier 2007: 351–352). The four-space model attempts to describe the complex product (e.g., the conceptual blend *surgeon-as-a-butcher*) as a dynamic process of linking, selecting, and integrating input materials (the ICMs BUTCHER and SURGEON, their links and their contrasts). This is visualized for the metaphor *This surgeon is a butcher* in Figure 27.2 (below).

The four spaces are input space 1, that is, the cognitive input provided by the target or topic (SURGEON); input space 2, that is, the input provided by the source or vehicle (BUTCHER); the generic space, that is, commonalities between both inputs, hence roughly the traditional *tertium comparationis*, although not presented as an intersection; and the blended space, that is, the elements finally selected from the other spaces and combined in specific ways to make sense. In Figure 27.2, the element in bold typeface at the bottom ("incompetence") is of special interest. It is what BT calls the *emergent* meaning of the metaphor—a crucial meaning that does not belong to any of the input spaces and is therefore not theorized by CMT (nor by traditional metaphor approaches that locate the added meaning of a metaphor exclusively in the identification of a *tertium comparationis*). In the example, incompetence is not part of the ICM of BUTCHER, yet it is the crux of the metaphor: a blend that meaningfully combines the means of butchery (i.e., severing flesh) with the ends of surgery (i.e., healing a patient) (Grady et al. 1999: 105–106).

Turner and Fauconnier (1999: 403) pitch their notion of emergent meanings against CMT. For "the standard view", which refers to or at least includes Lakoff-style CMT, "metaphor and analogy make their contribution by projecting structure from the source to the target or by finding shared structure". However, they proceed, a metaphor such as *The bulls pull in their horns* (referring to aggressive investors who suddenly stop being as active in the stock market) "does not project the nature of horns from source onto the target or find structure they share. Instead, it works by creating a blend". In the blend there is emergent meaning, that is, meaning that only pertains to the blend, for "in the blend, bulls can pull in their horns" (ibid.). Similarly, the brutality and incompetence of the surgeon-as-butcher does not stem from the input spaces and their potential analogies but from the meaning that emerges as the input spaces are made to *interact*. In that sense, BT has more affinity than CMT with Black (1962), although this affinity is not explicitly stated by BT (cf. Forceville 2004: 86).

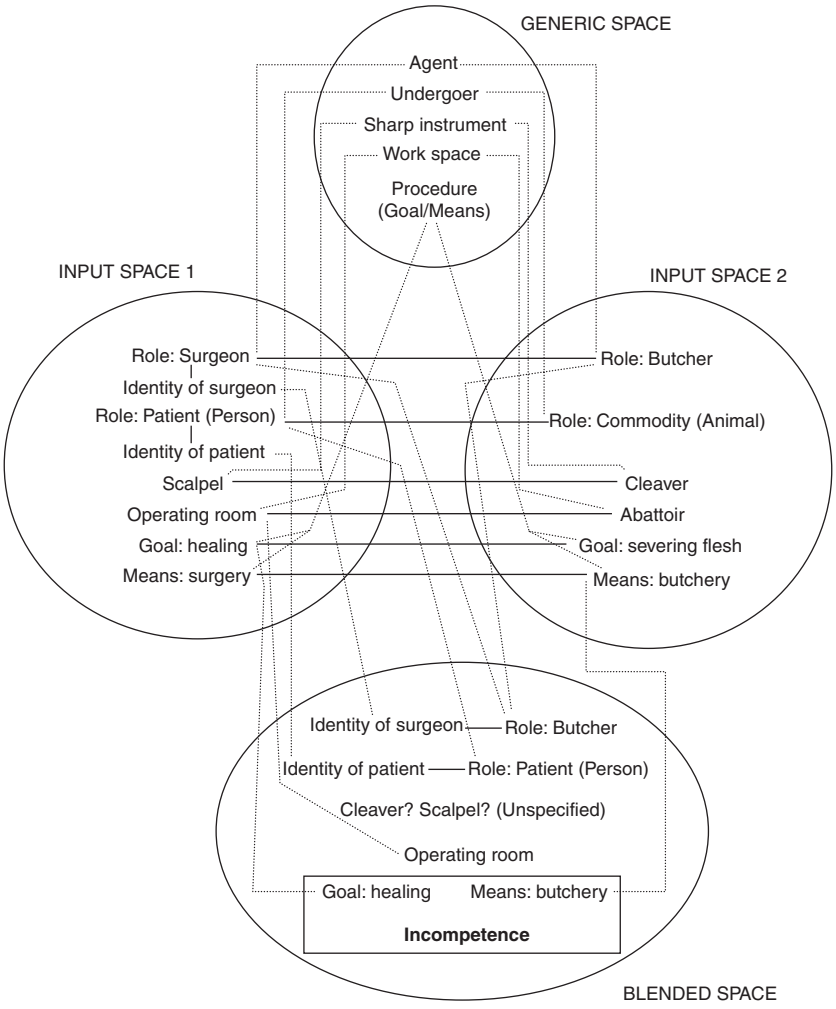


Figure 27.2 Conceptual integration network: surgeon as butcher
Source: Reprinted from Grady et al. (1999: 105) by permission of John Benjamins Publishing.

Emergence certainly applies to poetic contexts. In Baudelaire's poem, for instance, the sky-cover metaphor—*The Sky! black cover of the great cauldron/ In which boils vast, imperceptible Humanity*—has emergent meanings that are neither immediately derivable from the topic or input space 1 (humanity on earth and under the sky) nor from the vehicle or input space 2 (substances in a great cooking pot with a lid on top). In many senses and uses, the ICM of SKY suggests freedom, as in *The sky is the limit*, and may even be associated with the conceptual metaphor UP IS GOOD. When Baudelaire's readers discern anxiety or claustrophobia or doom, a sense of feeling trapped, this interpretation is due to an interaction or blending of content available in input spaces that are made to connect.

Regarding poetic analysis, BT acknowledges the embodied, imagistic aspects of emergent meanings (Grady et al. 1999), in line with CMT. In their discussion of possible principles that guide the blending process, for instance, Grady et al. (1999) signal the role of "scenarios", well-integrated "scenes", and "fanciful imagery". By contrast, as said, RT has from the start understood meaning in terms of propositional analysis (Sperber & Wilson 1986: 73), and still dismissed the importance of

imagery: "Although [*This surgeon is a butcher*] may evoke images of a surgeon hacking at flesh in the way a BUTCHER does", Wilson and Carston (2008: 25) write, "the assumption that the speaker meant that the surgeon was a butcher in this sense (i.e., that he cuts flesh just the way a butcher does) is both factually and pragmatically implausible, and is unlikely to be accepted as it stands". This is not certain at all. For one thing, the utterer may not have the last word when it comes to deciding on the meaning of the uttered metaphor—especially in the case of poetic metaphor (see Biebuyck & Martens 2011: 66). As Montaigne (1988: 127; translation in Melehy 1997: 48) reminds us, "a sufficient reader often discovers in others' writings perfections other than those that the author has put in or perceived, and lends them richer meanings and aspects". For another, the utterer may be a low visualizer and the interpreter a high visualizer.[21] In Baudelaire's poetic metaphor, the imagistic aspects seem paramount—the feeling of claustrophobia, the sense of being trapped, and a sense of doom are in my reading very much linked to the unstable hybrid image of being-on-earth-under-the-sky-as-in-a-cooking-pot-under-a-lid. The surface of the earth is steaming, the air is damp, perhaps, and the sky much like a dark closed-off lid.[22]

One incompatibility between BT and poetic analysis is that the four-space diagram remains too static a representation to capture literary interpretation processes. Narayan (2009: 74) observes that "mental spaces are dynamically created and blended as people think and speak", whereas "mental space diagrams […] are static in nature and, as Semino [2009: 59] notes, 'become impossibly complicated when applied to stretches of text longer than a few sentences'". When faced with such complexity, Narayan (2009: 74) counsels "prose-only blending analyses". Furthermore, Fauconnier and Turner "only provide a partial answer" to questions concerning the three principles that guide blending processes, namely, composition, completion, and elaboration (Tendahl & Gibbs 2008: 1844–1845). The BT diagrams are visual representations of blending processes that can be rendered as prose when they become overly complex, but both the diagram and the prose version are redescriptions rather than explanations. Besides the benefit of bringing emergence clearly into focus, where is the advantage of BT analysis vis-à-vis other types of poetic metaphor analysis?

A more radical critique of BT is formulated by Goodblatt and Glicksohn (2017: 7):

> while blending theory—with its emphasis on emergent structure and, further, of bidirectionality—might well contrast with CMT, it still presents a different theoretical position to metaphor comprehension in comparison with interaction theory. For while blending theory predicts the complete fusion of the two domains, we rather predict a continued potentiality for—and tension among—possible readings.[23]

In a special issue edited by Goodblatt and Glicksohn (2017), authors from a range of disciplines provide factors that may promote bidirectional readings of poetry: great semantic distance between topic and vehicle (Katz and Al-Azari; Goodblatt and Glicksohn); the lack of copula, as in visual metaphor (Indurkhya and Ojha); or the specific structure of the metaphorical phrase (Porat and Shen). Especially advantageous in the research of Goodblatt and Glicksohn is the combination of complex literary understanding with empirical methods, as well as their interest in specialist and non-specialist readers, and their combination of rating scales and interviews to investigate poetic metaphor understanding. They address complexity, variety, and dynamic instability in transparent ways.

4.6 Form Is No Formality

CMT's emphasis on the cognitive nature of metaphor "has sometimes overshadowed the question of how metaphor surfaces in language" (Sullivan 2007: 1), even though linguistic form deserves scrutiny—especially in poetic analysis. Given the poetic impact of form, it is equally unfortunate that Glucksberg, like many cognitivists, has almost exclusively focused on "a noun is a noun" constructions, such as *a surgeon is a butcher*, *a lawyer is a shark*, and *an accountant is a spreadsheet*.

Nonetheless, Glucksberg's experimental research does offer certain poetics-related insights regarding metaphor's form. First, he hypothesizes that metaphor and simile are not identical phenomena because people perceive similes, such as *Cigarettes are like timebombs*, as less metaphorical than their corresponding metaphors, here *Cigarettes are timebombs* (Glucksberg 2001: 46–47). It is likely, according to Gibbs (2002b: 111), "that actually recognizing a statement as a metaphor (as linguistic type) alerts readers to the very possibility of rich cross-domain mappings, which immediately leads readers to seek out some of these rich metaphoric meanings". It is also likely that certain linguistic forms, such as the *like* in similes, tend to restrain the tendency to seek out rich metaphoric meanings. In comparison statements, any hedging—that is, any linguistically expressed weakening of the force of the statement—seems to decrease perceived metaphoricity. Thus, the straightforwardly stated metaphor *Cigarettes are timebombs* is felt by subjects to be more metaphorical than the hedged metaphorical statement *Cigarettes are virtual timebombs*, which is felt to be more metaphorical than both the simile *Cigarettes are like timebombs* and the qualified simile *In certain respects, cigarettes are like timebombs*, which in turn are more metaphorical than *Cigarettes are deadly, like timebombs*. The latter is a simile that even spells out the most relevant feature to be attributed to the topic, so that other features of *timebombs* that could be attributed to cigarettes, for example deadliness *after some time*, are sidelined (see Glucksberg 2001: 46–47).

Second, Glucksberg (2008: 75) suggests that metaphor and simile are not identical because similes tend to evoke less "emergent" properties than metaphors do. In the case of the metaphor *Some ideas are diamonds* and the corresponding simile *Some ideas are like diamonds*, emergent properties such as 'insightful' and 'creatively very unique' were more frequently evoked by the metaphor than by the simile, which more typically evoked properties such as 'shining', 'glittering', and 'desirable'. This suggests, following Glucksberg, that similes tend to activate the basic-level "literal diamonds" concept whereas metaphors activate an ad hoc superordinate "metaphorical diamonds" concept. Although this hypothesis seems overly binary, it does address an interesting question (see also Gleason 2009): Are certain linguistic constructions more prone to triggering mental imagery than others?

A classical reference on the language of metaphor is Brooke-Rose (1958), whereas Sullivan (2007) is a fuller and up-to-date CL treatment of constructions used in metaphoric language. According to Sullivan's (ibid.: 67) corpus account, which combines CMT with Construction Grammar and Frame Analysis, "most of the constructions used to communicate metaphor can be categorized into a few classes". The two most frequent classes are "predicate-argument constructions", such as *stocks soared* (ibid.: 71), Tennyson's *Now sleeps the crimson petal* (quoted in Steen 2009), or Borges's *Late in the afternoon/ the two or three colors of the patio got tired* (1923/1989: 23), and "preposition phrase constructions" with a possessive or genitive link, such as *the mind's eye*, *an explosion of geraniums*, and *the empty house of my memory*. Also important, although less frequent, are "predicating modifier constructions", in which the head noun/adjective/verb/ evokes the target domain and the modifier evokes the source, such as *a bright student*; "domain constructions", in which an adjective, adverb, or noun evoking the target domain modifies the head that evokes the source domain, such as *a mental exercise* or "water boulders like petrified fish" (Haesaert 2015: 283); and "copula constructions", such as *This surgeon is a butcher*; *Caroline is a princess; memory is a knife; all bodies will be burns*. Evidently, some types of constructions are "staple techniques" in certain movements or poetic voices, or else anathema in other contexts (Martens & Biebuyck 2013: 253, 255). Even more evidently, dense poetry piles up constructions.

Regarding poetic metaphor in general, understood as metaphor appearing in poetry, Sullivan (2007: 405) subscribes to Lakoff and Turner (1989) but also notes that "the unique effects of poetic metaphor are achieved through […] the choice of words, constructions, and other devices". Regarding constructions, Sullivan (2007: 417–418) observes that "the rarest of the basic metaphorically used constructions, equations such as *time is money* (accounting for 1.5 percent of

the metaphoric constructs in my corpus), appear to figure larger in poetry than in most types of language use", probably "because equations precisely specify a mapping" and therefore readily produce rich mental imagery, such as *The patio is the slope / down which the sky flows into the house* (Borges 1923/1989: 23). Other rare constructions that are more frequent in poetry include "equations involving apposition" (*The Sky! black cover*) and some other forms of equations, relative clauses and conditionals (for details see Sullivan 2007: 422–426). Furthermore, two constructions are unique to her poetic subcorpus: "parallelism", such as *The crown o' the earth doth melt. ... O, wither'd is the garland of the war, The soldier's pole is fall'n*, referring to Mark Antony's death in Shakespeare's *Antony and Cleopatra*, and "negation of the literal", such as Emily Dickinson's *I taste a liquor never brewed* (Sullivan 2007: 429, 432).

Finally, and as a matter of course, "poets and other authors sometimes leave a domain intentionally underspecified", indicating it only in the title or at the end of the poem, or leaving it entirely implicit. When left unspecified, the domain may be either relatively easy to retrieve by convention, as in Robert Frost's "The Road Not Taken", or not so easy at all, which may invite certain readers to interpret the mentioned domain non-metaphorically (Sullivan 2007: 436, 437). It is for example possible, albeit impoverishing, to read Albert Camus's *La peste* (1947) not as an allegory but only as a story about a city terrorized by the plague, or Melville's *Moby-Dick* (1851) only as the narrative of revenge on a whale and not as a political allegory about "the ship of state" that was "foundering" (Delbanco 2003: xx). Allegories are extended cases of metaphors *in absentia*, or what Peter Stockwell (2002: 107) calls "invisible metaphors". If we follow Lodge's (1992/2011: 143) idea that a full-blown allegory "does not merely suggest something beyond its literal meaning, but insists on being decoded in terms of another meaning", then *La peste* and *Moby-Dick* are not cases in point. In full-blown allegorical narrative, says Lodge (ibid., my emphasis), the stretched point-by-point correspondence between stated meanings and implied meanings "tends to work *against* what Henry James called 'the sense of felt life'", except in satirical masterpieces such as *Animal Farm*. Interesting in this regard are documented cases where an author intends an implicit extended metaphor to be allegorical, whereas the audience mainly finds poeticality in the literally stated meanings.

Complex discursive configurations invite "complex sets of mappings", which are "not advantages in most everyday language" yet fruitful in poetic texts (Sullivan 2007: 441). This is apparent, for instance, when David Byrne, in the Talking Heads song "Heaven", sings that

> *Everyone is trying / To get to the bar / The name of the bar / The bar is called Heaven*, […]
> *Heaven is a place / A place where nothing / Nothing ever happens*, […]
> *It's hard to imagine that / Nothing at all / Could be so exciting / Could be this much fun*.

These lyrics become poetic when the bar called Heaven is seen as a source from where to construct an implicit target or range of targets. The song then guides the listener to posit and construct topics or targets (people, their desires, and so on) and understand them in terms of the mentioned sources or vehicles—an operation that indeed requires complex mappings. At the same time, in the other direction, listeners may imagine a literal bar scene and indeed think of its guests as people looking for bliss, a heaven on earth, and so on.

In this regard, at least two more things should be stressed regarding directionality and the predicative force of the linguistic form in which a metaphor appears. First, on the microscopic level, each construction tends to commit or de-commit the utterer to a certain extent, hence each uttered metaphorical construction has more or less force when inviting the reader to perform a conceptual interaction between source and target. Todorov (1977: 105) refers, for example, to Empson's idea that assertion can exist without predication (that is, without subject-predicate structure) by naming something. The use of genitive metaphors such as *waves of immigrants*, for instance, is an Empson-like "Existence Assertion", a framing device that asserts without however taking the prototypical

form of assertion. In metaphor, as elsewhere, Empson-style assertion (i.e., the presupposition of the existence of something by naming it) is even stronger than plain assertion. In Snoek's *it's a pity/ there is no secret language/* […]*/ A language, as I said,/ that I can write with/ About love/ in the empty house of my memory*, the reader is instructed to assume as a fact, by means of an Existence Assertion, that the memory of the persona is an empty house (the translation is James Holmes's).

At the same time, the *textual* makeup of Snoek's poem—where *About love/ in the empty house of my memory* forms a stanza—allows and even invites the reader to give some thought to *the empty house of my memory*. This brings us to the second level of form: textual configuration can foreground constructions (cf. Stockwell 2002: 13–14) and make constructions interact. Like other texts, poems may not straightforwardly assert a metaphor, for example by means of direct equation, but rather configure a complex metaphor through various, and variously disposed, constructions. As RT scholar Pilkington (2000: 103, my emphasis) points out, a "good poem" enables its metaphors to be read in a rich way by activating "a wide network of contextual assumptions *prior* to the interpretation of the metaphorical utterance itself". Gil de Biedma (1968), for instance, metaphorically calls up some ordinary assumptions—life is a stage play, with death as an invisible background—in order to reverse the assumption by means of a related metaphor. According to Martens and Biebuyck (2011: 62–63), literary metaphors even differ from daily ones in that the former work mostly with information that is mobilized "intratextually", involving major portions of the surrounding text.[24]

In certain poetic text configurations, the readerly activity may call into question metaphor's irreversibility as theorized by Glucksberg, for example that the assertion *My surgeon is a butcher* is not reversible to the assertion *My butcher is a surgeon*. I have already suggested potential bidirectionality in Byrne's lyrics for "Heaven". Longer ago, in a sophomore paper for my French poetry class (1991), I made a similar argument concerning Baudelaire's poem "The Cat", as translated here by William Aggeler:

> Come, superb cat, to my amorous heart;
> Hold back the talons of your paws,
> Let me gaze into your beautiful eyes
> Of metal and agate.
> When my fingers leisurely caress you,
> Your head and your elastic back,
> And when my hand tingles with the pleasure
> Of feeling your electric body,
> In spirit I see my woman. Her gaze
> Like your own, amiable beast,
> Profound and cold, cuts and cleaves like a dart,
> And, from the head down to the feet,
> A subtle air, a dangerous perfume
> Floats about her dusky body.

My argument in the sophomore paper was that the poet persona not only likened the look of his woman (*son regard*) to the look of the cat he was talking to (*comme le tien*, "like yours"), but that he also likened the look of the cat to the look of his woman. *Non!* was my professor's short written evaluation. At the time I was convinced I was right, as in fact inspired by the (symmetrical) *tertium comparationis* view expounded by the professor himself, although I did intuitively understand his blunt rejection as well—a rejection I later saw more explicitly theorized by the notions of predication and irreversibility. As I reread the poem now, however, I happily stand by the reversibility argument of my sophomore paper. To be sure, the *cat*'s appearance and demeanor is predicated about the poem's topic (i.e., the *woman*'s appearance and demeanor), yet Baudelaire manages to

combine constructions and depict a scene so that the poem's topic is also, to some extent, the *cat* sitting before the poet persona and blending with the image of his woman.

To the extent that this is true, the poet radicalizes bidirectionality as he takes it from construction (or sentence) level to text level. On the constructional level, unidirectional assertion is unavoidable because, however much source and target interact, it is asserted that the vehicle applies to the topic, not that the topic applies to the vehicle. On the text level, however, this unidirectional tendency of assertion can be neutralized. The poem is mostly about his woman (who is likened to the cat), but also, I suggest, to some extent about this cat (who is likened to the woman).

4.7 Recommendations for Further Practice

The practice of CP metaphor analysis requires testing a large variety of insights against metaphors in poems, literature at large, and other poetic contexts, with a view of throwing light on the meaning of the poetic metaphor in its textual and contextual setting. To that end I now propose a template for analysis that summarizes a number of important propositions from various theories.

i. Linguistic metaphors are not 'surface' realizations. The specific metaphorical constructions and textuality are highly significant in poetic analysis.
ii. Poetic metaphors often leave the target domain implicit. Especially in complex or sustained metaphors, and obviously in allegories, the target may remain perfectly unstated. These are metaphors *in absentia*. As Stockwell (2002: 107) signals, "it matters quite a lot to literary interpretation whether the metaphors are visible or invisible", because the latter requires a great deal of creative input on the part of the reader.
iii. The implicitness of the target (or topic) suggests an array of inferentially weak—although poetically significant—implicatures for the reader to discover. This discovery process is the reader's creative attempt to satisfy the expectation of relevance guaranteed by communication. An implicit target requires readerly creativity and, possibly, multiple interpretations.
iv. Literature—especially poetry—is a genre context that calls for a maximax approach.
v. For the analysis of metaphors *in presentia*, where we find at least one linguistic item that signals the target, the term *topic* is more fortunate than *target* in one important sense: *topic* signals that poetic metaphors are a form of poetic communication. It is a structure of all communication that something new (a comment) is predicated about something already brought up or known (the topic). As Steen (2009: 215) writes, "topic interpretation […] is constrained by the specific demands of the utterance in the discourse in context, hinging on local and global referents and discourse topics". A topic that is present (or visible) and identified is a first explicit context that allows interpreters to ascribe meaning to the vehicle that is asserted about it. When an author likens something to *knives* (or *daggers*), it is obviously significant that this something is narrowed down to *bodies* (Cernuda) or *memories* (Hustvedt).
vi. Whereas Glucksberg, RT, and others have stressed this communicative aspect of metaphor use, CMT is better equipped to analyze the specific conceptual content that metaphors map from source (vehicle) onto a target (topic). Consider for example that Cernuda's *Otros [cuerpos son] como puñales* has been translated as either *Other bodies are like knives* or *Other bodies are like daggers*. Some Spanish readers interpret Cernuda as saying that some bodies not only threaten, hurt, and kill, but that they do so *in a backstabbing way*—a notion perhaps more readily associated with the ICM of *dagger* (and *puñal*) than with the one of *knife* (or the Spanish *cuchillo*).
vii. Likewise, or more radically, Eco (1983: 229, my emphasis, also 243, 247, 254) argued that metaphor interpretation works not with "dictionary" meaning, which is "supposed to set forth only those properties that are necessary" to define a concept, but with "encyclopedic" meaning, which "includes all those units of knowledge that concern the contexts in

which a given lexeme will occur" and is therefore "potentially *infinite*". Conversely, says Eco (ibid.: 256), "metaphor is the tool that permits us to understand the encyclopedia better. This is the type of knowledge that metaphor stakes out for us"—for example that DAGGER may have a more backstabbing quality than KNIFE.

viii. If we combine the maximax principle, the potential infinity of semiosis, and the mechanism of implicitness (RT's array of weak implicatures), we have a triplet that goes toward explaining why readers can "run" a poetic metaphor, to use the term of BT.

ix. Expert readers have access to specialist knowledge that allows them to run the metaphor based on information not contained in the poem. This expert knowledge includes literary expertise and obviously also biographical, historical, and social information. Some readers may for example know that Cernuda was gay and that he addressed his sexual orientation in poetry; some may also know that by 1931, when he published "Some bodies are like flowers" as part of his collection *Forbidden Pleasures*, he had become unapologetic in doing so. The poem has been interpreted by specialist readers as homoerotic, including S&M metaphors (Ulacia 1986: 70; Barón Palma 2002: 120).

x. A poetic metaphor usually does not stand isolated. On the one hand, texts give readers access to assumptions that allow them to 'adjust' a lexical item metaphorically, that is, to strip it down to its most relevant features. On the other hand, texts can mobilize semantic domains either in preparation of a *richer* understanding of the verbal metaphor, when it presents itself, or as a follow-up, as a posteriori enrichment.

xi. Although it is interesting for poeticians to ask if specific poetic metaphors tap into conceptual metaphors (e.g., in the sense that conceptual metaphors are highly accessible structures for interpretation), it is at least equally interesting to investigate how poetic metaphors are different from daily metaphorical thinking. CMT to some extent also suggests that poetic metaphor is about deviance: poetic "extensions of the used part", poetic "instances of the unused part", "novel metaphors", "composite metaphors", "explicit commentary" on the limitations of conceptual metaphors, the offering of an alternative. As Turner (1990) notes, poeticality can arise from violating principles, if readers somehow manage to ascribe meaning to the violation.

xii. Poetic metaphors are often imagistic. Unlike RT, which has denied that the surgeon-as-butcher can validly be taken to communicate images of a surgeon hacking at flesh, CMT co-established an *embodied* cognitive science that no longer treats mental imagery as a mere epiphenomenon of propositional cognition (see, e.g., Rohrer 2007: 341). Because (mental) imagery activates emotion circuits in the brain, the embodied meanings (imagery, gestures) triggered by metaphors are poetically relevant. Also, metaphoric mental imagery increases its emotional force if it accomplishes a figure-ground reversal or reconfiguration.

xiii. Blending Theory demonstrates that metaphor comprehension is not the figuring out of a *tertium comparationis*, not merely the mapping of a source onto a target (as in CMT), not merely the ad hoc adjustment of the vehicle so as to reach relevance with regard to the topic (as in RT and Glucksberg), but also the production of so-called "emergent" meaning. This emergent meaning does not belong to either source or target, nor to source *and* target, but to the blended concept of target-seen-as-source.

xiv. Cognitivism invites poetics to ponder poeticality in relation to perceived degrees of metaphoricity, as well as perceived degrees of metaphoricity in relation to textual and contextual embeddedness, especially genre. Out of context, the most salient meaning of conventional metaphors, such as *spill the beans*, is the metaphorical one ("tell people secret information") and not the literal meaning ("to spill something, namely beans"), hence the usual metaphorical meaning will be something ordinary, unnoteworthy, non-poetic. On the other hand, novel metaphors have higher degrees of perceived metaphoricity, certain genres

gear attention toward metaphoricity, and the increased awareness of metaphors in poetic texts tends to enhance metaphor appreciation and the emotional response to metaphor.

xv. The potential richness of a metaphor is a product of some conceptual aptness that makes it easy or relatively feasible to run the metaphor. Non-trivial apt metaphors, Eco (1983: 236, 243) suggests, are those that uncover hitherto hidden analogies in our "polydimensional" network of encyclopedic knowledge and our "way of naming concepts", whereas others argue that apt metaphors lay bare real, ontological similarities. On the first (constructivist) view, poetic genius reveals unexpected analogies between categories and domains of knowledge, on the second (realist) view it uncovers deep ontological analogies that objectively exist between things. In any event, both views keep referring to analogy. As even Glucksberg (2008: 79) eventually concedes, some notion of comparison or analogy cannot be entirely banned from metaphor analysis.

5. Future Directions

The predicate 'poetic' has a complexity that cognitive literary metaphor analysis can approach in paradigmatically distinct ways (see Caracciolo 2016). Poeticians and stylisticians investigate poetic metaphors in order to understand poeticality, and specifically metaphoric poeticality, which is their explanandum. Cognitive scholars often take the quality of poeticality for granted, predefine it in some specific or less specific way, and investigate whether it is associated with cognitive aspects of certain specifiable metaphors, which is their explanandum. Hermeneuticians investigate poetic metaphors for their meaning in a literary text, which is their explanandum. Scholars with an interest in poetic metaphor and cognition can belong to any of these groups. The main interdisciplinary challenges for these groups are paradigmatic—different interests, different methods, and different levels of explanation that are considered relevant or acceptable.

Whichever approach is chosen, we have seen that the poeticality of metaphors is associated with a whole range of mechanisms or properties. Poetic metaphors

- set a scene or thought before our eyes
- prompt an emotion-related image
- prompt an emotive Gestalt switch
- produce emergent meanings
- trigger qualia-like representations
- create an illusion or semblance of felt life
- extend or challenge daily metaphors
- are invitations to break predicative habits as unusual analogy is asserted and understood
- frame something known in an unexpected way, leading to insight, emotions, and shock
- allow for a rich running of the metaphor
- implicate readers by leaving the source implicit
- fluctuate and are revisable
- are intratextually prepared, elaborated, or revised
- are under no tight authorial control
- simultaneously activate qualitatively different meanings
- have bidirectional quality

Interestingly, these explanations mostly refer to the *special* character of poetic metaphor—to what I called the differential issue: they produce emotions via exceptional imagery, a reversal of the ordinary, a new insight into a situation, a new insight into the structure of specific concepts, a new insight into conceptual relations in our encyclopedia, a challenge of the common, an emergence

of meaning, an exceptionally rich conceptual interaction, a great gap between the explicitly stated and the inferable, a loss of authorial control, and an increased self-awareness of the interpreter. The aptness of poetic metaphors is not just an explanandum but also a starting point, an entrance door, a tool to understand the mind—the many mind*s*. It is here that hermeneutic approaches have an important role to play, because they show the heterogeneity of metaphor interpretation as carried out by variously specialized minds.

Cognitive poetic metaphor analysis needs to attend to all levels of communication, knowledge, and evaluation, such as the words, constructions, implicit elements, topic-vehicle interaction, textual configuration, genre embedding, assumable situation, cultural knowledge, and various individual perspectives of the participants involved. Regarding the analysis of poetic metaphor in narrative fiction, one question is: Which narrative participant uttered the metaphor in which narrative situation? Narrators may use metaphors as part of their voice; authors may put metaphors in the mouth of their first-person narrator in order to characterize that narrator; narrators may use metaphors in their intent to represent the story world as qualitatively experienced by characters (Caracciolo 2016); narrators may quote metaphors by characters in order to characterize those characters; or characters may be understood to use certain metaphors as part of the action logic in which they are engaged (for examples of some of these configurations, see, e.g., Martens & Biebuyck 2013; Caracciolo 2016). Other important questions are identified by Martens and Biebuyck (2011): Do metaphors contribute to the narrative dynamics? Is there a master trope in a narrative? Do metaphors compete on the authorial, narrational, or actional levels? Do certain tropes become ambivalent in the course of reading? Does the introduction of a metaphor at some point throw new retrospective light on earlier plain narrative sequences? Whether cognitivist or not, the analysis of metaphor in narrative fiction brings us to a specific genre that requires a profound knowledge of narratology, that other grand branch of poetics.

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Notes

1 Besides the already mentioned references, see, e.g., also Richardson 2006; Caracciolo 2013; Burke & Troscianko 2013; Harrison & Stockwell 2014; Cave 2014; Cave & Wilson 2018.

2 I will take CMT to refer to the research line of Lakoff and associates, not to the research initiated by Fauconnier and Turner (i.e., Blending Theory), although there are obvious institutional, personal, and intellectual connections between the two (see below).

3 It will not concern us here that Aristotle's notion of metaphor includes more phenomena (e.g., metonymy) than modern notions (see Ricœur 1975; Eco 1983).

4 To be precise, Black (1962: 34, 36) coined the 'substitution view' and 'comparison view' fallacies, which he associated with Aristotle by means of two short footnotes. In the substitution view, says Black (1962: 32, 36), "the word or expression having a distinctively metaphorical use within a literal frame, is used to communicate a meaning that might have been expressed literally", so that *Richard is a lion* "approximately means the same as" *Richard is brave* (32, 36). This makes metaphor a decoration (34). In the comparison view, a metaphor is "a condensed or elliptical simile", so that *Richard is a lion* is approximately the same as *Richard is* like *a lion (in being brave)* (36). The problem with the latter view, says Black (1962: 37), is the suggestion that metaphor merely signals resemblances supposedly existing "prior to the construction of the metaphor".

5 As Sullivan (2007: 31) notes, "there is no general agreement—nor even much discussion—on how to define the type of 'domain' used in metaphor". Generally, *domain* seems to refer to background knowledge whose structural links arise from—are grounded in—experience and then organize that experience as a complex whole with many components and relations.

6 Black (1962: 37) had already written that there are "cases" where "it would be more illuminating to say that metaphor creates the similarity than to say that it formulates some similarity antecedently existing". Lakoff and Johnson (1980) do not credit Black (1962) for this idea.

7 Inspired by Kant's notion of *schema* (1781), an image scheme is considered "more abstract than a [concrete] image but less abstract than a proposition" (Gleason 2009: 438 and references there).

8 Interestingly, Gleason (2009: 451) argues that "metaphor specific" imagery—what he calls the *visual template* of an image metaphor—is typically richer in detail than the quite abstract image schemes but somewhat more abstract or "sketched out" than specific detailed images because the visual template is a "greatest-common-factor image".

9 See also Halliwell (1986/1998: 90), who notes that Aristotle defines "the endowment not as a mysterious instinct but as 'the capacity to see resemblances'". Therefore, "although metaphor can be analytically examined and classified […] it clearly remains resistant, in Aristotle's eyes, to a 'technical' understanding […] The reason for this is that metaphor, although it *can* be regarded as a stylistic ornament alongside other types, is valued by the philosopher as a unique means of expressing certain perceptions" (ibid.: 349, original emphasis).

10 Based on psycholinguistic experiments, Giora (2008: 628, and references there) hypothesizes the salience-nonsalience distinction, which distinguishes between text interpretation that relies on salient lexical meaning (i.e., on coded meanings automatically activated by a lexical item) and interpretation that combines salient meanings with non-salient ones (i.e., derived from context). The salience-nonsalience distinction cuts across the literal-figural divide: the interpretation of metaphors is often exclusively based on salient meanings, which by themselves do not tend to produce poeticality, whereas the interpretation of certain literal expressions combines salient and non-salient meanings, which may produce poeticality under certain conditions. For Giora, what makes discourse aesthetic or poetic, is not the presence of metaphor per se, but rather the presence of an "optimally innovative stimulus", that is, a stimulus that activates a non-salient sense of an expression and a salient (unavoidably activated) one from which the non-salient one differs qualitatively. This poetic effect may happen in metaphor, as when the saliently literal *Their bone density is not like ours* is used metaphorically in a certain context, but it may also happen in "literals", as when the saliently metaphorical expression *spill the beans* is suddenly used literally in a certain context (ibid.: 154). Thus, metaphor can be poetic, but so can literals. What defines poeticality is an interesting combination of salient and non-salient meanings that needs to be processed.

11 My suggestion that mental imagery can "resolve" metaphors is inspired by Goodblatt and Glicksohn, who have argued that the reading of difficult poetic metaphors is a form of "problem solving [that] involves an act of perceptual and semantic restructuring" (2002: 428). A mental image of scattered geranium petals is for example a (mental) percept that resolves a strange image metaphor. The characterization of some imagery as "fanciful" is taken from Grady et al. (1997: 108).

12 Additionally, there is much experimental evidence that also refutes the Gricean-Searlean idea that metaphor understanding is a two-stage process (see Giora 2008 and references there).

13 Glucksberg's theory (i.e., metaphor understanding as inclusion in a category produced on the fly) is explicitly pitched against CMT (i.e., metaphor understanding as activating existent conceptual relations in the mind). Thus, for McGlone (2001: 95), an associate of Glucksberg, CMT falls prey to circular reasoning: "How do we know that people think of theories in terms of buildings? Because people often talk about theories using building-related expressions. Why do people often talk about theories using building-related expressions? Because people think about theories in terms of buildings." This is criticism also formulated by researchers closer to CMT (see Müller 2008: 16 and references there). However, the embodied-gestural research of Müller (2008) and other research (see Tendahl & Gibbs 2008: 1850) does offer empirical evidence that metaphors may appear dead on a systemic level but be awake or active in a specific discourse event. Research such as Müller's seems to turn the alleged circular reasoning into a kind of Kantian transcendental deduction—CMT has posited an abstract mechanism explaining empirical phenomena that would otherwise remain unexplained, such as source-domain-related gestures or source-domain-related mental imagery while producing supposedly dead metaphors (on the testability of CMT, see Gibbs 1994; and Tendahl & Gibbs 2008).

14 Incidentally, the negative class inclusion statement shows that metaphor is not a matter of literal falseness leading the interpreter to nonliteral truth (as some traditional pragmatic and other truth-conditional accounts suggest), because the negating sentence *is* literally true and nonetheless also meaningful in a metaphorical interpretation.

15 *This surgeon is a butcher* is perhaps less likely to be literal than *Caroline is a princess*, but everything always depends on context. When you say about your friend at a party that *This surgeon is a butcher*, a special effect may actually lie in the fact that the relevance of your utterance is unexpectedly to be sought in the literal meaning of the predicate. Some surgeons may also be butchers. A friend of mine is a certified butcher with a PhD in DNA analysis; and there are conceivable contexts in which it is relevant to state literally *This DNA analyst is a butcher*.

16 *Cognitive effects* of utterances on audiences are defined as either information that is relevant because it confirms and strengthens an existing assumption manifest to the hearer; or information that is relevant because it contradicts an existing assumption (and possibly eliminates it); or information that is combinable with an existing assumption and so yields a new assumption (see also Tendahl & Gibbs 2008: 1848).
17 This mutual adjustment process always happens, in literal and metaphorical communication, so that RT does not endorse the standard Gricean account of metaphor interpretation as a two-stage process.
18 Compare this with Grady (2007: 206–207), who concedes that there is continuity between metaphor and category accommodation but goes on to stress the importance of metaphor as a distinct phenomenon: "there is no sharp line between metaphor and cases where a category is 'stretched' to accommodate a new item […] Nevertheless, there is a massive body of indisputably metaphorical examples to serve as materials for study; the 'central' cases are clear."
19 See, e.g., Pilkington (2000: 94): "From the relevance theory point of view one would expect it to be the case that there is no fixed hierarchy within the assumptions stored in the encyclopaedic entry attached to a concept. Certain assumptions will become more highly salient in some contexts; other assumptions will become more highly salient in other contexts." This is true, of course, but concepts do have structure out of context. Here, Lakoff and Johnson (1980) would signal that the mind has a repertoire of ICMs to exploit; Schank and Abelson (1977) would signal that the mind's repeated confrontation with *similar* situations and scenarios has sedimented a repertoire of scripts to exploit. Tendahl and Gibbs (2008: 1835, 1859) wonder in that regard why RT "resists the notion of enduring metaphorical thought" and suggest that conceptual metaphors exist in our minds and can be activated as "parts of our cognitive environments". This should appeal to RT, they argue, given RT's interest in the degree of cognitive *accessibility* of assumptions.
20 Pilkington (2000: 166–169) does acknowledge (i) that the implicit background knowledge mobilized by metaphors is conducive of "mutually manifest" assumptions and hence a feeling of intimacy and (ii) that metaphors are suitable to communicate "a qualitative feel" and a precise and rich "phenomenal tone" when readers access "phenomenal memories", that is, remembered feelings of what certain things are like (ibid.: 156ff).
21 All visually non-impaired persons have visual mental imagery, but there are "high" and "low" visualizers, as measurable by for example the Vividness of Visual Imagery Questionnaire or VVIQ (see Marks 1973).
22 Carston (2018: 198) still claims that "mental imagery is not an essential component in the comprehension of language […] but it is often automatically activated in the minds of hearers or readers as a by-product", and that even in so-called creative metaphors, "imagistic effects" are "not essential", although they "can be as significant as propositional cognitive effects".
23 Somewhat relatedly, although without criticizing BT, Gleason (2009: 439, 458) argues regarding image metaphor that the mind can "mingle parts of disconnected visual images" (2009: 458) and "shift back and forth in the imagination" between different visual images but not "fuse the images" to "form a new image with all the features of both".
24 The textual or discursive surrounding of the metaphor should always be taken into account, because it may indeed mobilize a large array of meanings or may do the exact opposite (i.e., pin meaning down, textually or conventionally). The dominant xenophobic interpretation of *wave* in the combination *waves of immigrants* depends for example to a large extent on the surrounding xenophobic discourse, because by itself a wave can be a very positive thing—both literally (as when a wave of seawater gushes over us on a hot summer day) and metaphorically (as when you may like a certain wave of rock music).

Further Reading

Cave, T., & Wilson, D. (Eds.). (2018). *Reading beyond the code: Literature and relevance theory*. Oxford: Oxford University Press. (This collection of papers represents the recent engagement of RT with literary scholarship.)

Fludernik, M. (Ed.). (2011). *Beyond cognitive metaphor theory: Perspectives on literary metaphor*. New York: Routledge. (This collection of papers critically reflects on the applicability and use of CMT in literary studies.)

Gibbs, R. W. (2008). *The Cambridge handbook of metaphor and thought*. New York: Cambridge University Press. (This collection of papers summarizes a wide array of non-literary cognitive theories of metaphor, including CMT, BT, and RT, but also views not presented in this chapter.)

Goodblatt, C., & Glicksohn, J. (2010). Conversations with I. A. Richards: The Renaissance in Cognitive Literary Studies. *Poetics Today*, *31*(3), 387–432. (This paper provides a good starting point to understand today's main literary advocates of Bidirectionality Theory.)

Hogan, P. C. (2003). *Cognitive science, literature, and the arts: A guide for humanists.* New York: Routledge. (This is an early and excellent introduction to cognitive literary scholarship.)

Lakoff, G., & M. Turner (1989). *More than cool reason: A field guide to poetic metaphor*. Chicago: University of Chicago Press. (This is CMT's main monograph on poetic metaphor.)

Stockwell, P. (1999). The inflexibility of invariance. *Language and Literature*, *8*(2), 125–142. (This short article articulates a critique of Lakoff and Turner 1989.)

Related Topics

standard and extended conceptual metaphor theory; cognitive pragmatics; cognitive linguistics and discourse studies

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28

COGNITIVE LINGUISTICS AND DISCOURSE STUDIES

Ulrike Schröder

1. Introduction

In his classic work on the basic tenets of cognitive grammar, Ronald W. Langacker (2008: 457) postulates that discourse is the very basis of language structure. He explicitly refers to spoken discourse when he calls for the "conversational use of language" to be conceived as "primary" (Langacker 2008: 460). He also highlights the communicative perspective, arguing that in interaction, linguistic structures are displayed as instructions issued by the speaker for the addressee (Langacker 2008: 460). This basic conception of language reminds us of the almost forgotten writings by the academic outsider Phillip Wegener (1991 [1885]) at the end of the 19th century whose work laid the foundation for a pragmatic-cognitive view of metaphor. He presumed that the principal goal of talk is the persuasion of the interlocutor as a form of influence for triggering a certain action, a certain volition, or a certain state of consciousness. It is precisely this shift from an extracommunicative to a communicative viewpoint[1] that marks a growing amount of empirical research on discourse in the domain of cognitive linguistics (CL).

The recent increase and diversification of discourse studies in CL goes back to a development that was heralded at the beginning of the new millennium when cognitive linguistics began to divert its focus from mere universal matters to intralinguistic, sociolinguistic, cultural, as well as individual variation, together being responsible for the "social turn" (Geeraerts 2016: 527–528). Additionally, a further crucial redirection can be observed, already visible in Langacker's introductory quotation, that is, a shift from written to spoken discourse. While 'discourse' in CL was for a long time conceived in terms of a fusion of cognitive linguistics and critical discourse analysis (Dirven, Polzenhagen, & Wolf 2007; Hart 2015) with a special focus on metaphor, over the last ten years the picture has changed rapidly: CL has initiated and intensified research on dialogic data and multimodal interactional conceptualizations neglected over decades when it exclusively relied on monological and written data samples (Zima & Brône 2015: 485–487). Hence, the following overview will confine its attention to different domains of research on written and spoken discourse related to CL. As we will see, although metaphor still accounts for the highest proportion, especially during the last two decades, significant studies have evolved around topics such as metonymy, blending, construction, viewpoint, and discourse models in general.

2. Metaphors

One of the most basic insights of conceptual metaphor theory (CMT) is the 'highlighting and hiding effect'. This means that metaphors turn into tools for sanctioning actions, justifying inferences, or setting goals, as Lakoff and Johnson (2003 [1980]: 10–13, 67) illustrate by means of the conceptual metaphors TIME IS MONEY, TIME IS A VALUABLE COMMODITY, and TIME IS A LIMITED RESOURCE, as these metaphors involve a specific worldview, while other possible ways to conceive time are concurrently faded. Hence, conceptual metaphor plays an essential role in "the creation of meaningfulness, the interpretation of the world, and action orientation" (Debatin 1995: 225).[2]

As a consequence, shortly after its first success and diffusion, CMT has been adopted for critical discourse analysis (CDA). Lakoff himself investigates the political worldviews of conservatives and progressives in the USA, to find their underlying 'Strict Father' or rather 'Nurturant Parent' model (Lakoff 1996). Since the 1990s, a lot of research has been developed based on written media. Comparing the metaphorical elaboration of the changes after the end of communism in German and Russian newspapers, Baranov and Zinken (2003) reveal that each discourse is dominated by one key metaphor: TRANSFORMATION IS REBUILDING (*perestrojka*) in the Russian corpus and TRANSFORMATION IS A TURN (*Wende*) in the German corpus. However, these metaphors should be understood rather as 'discourse metaphors' as opposed to conceptual metaphors, since they are related to conceptual knowledge structures, cultural scripts, and stereotypes, as emerging in social interaction (Zinken & Musolff 2009). In a similar vein, Musolff (2003) coins the term 'metaphorical scenarios' when examining the political discourse about the development of the EU, pointing out that JOURNEY with its inherent concepts of speed, punctuality, delay, forward and backward movements, as well as impediments and derail, is used in British as well as German print media. However, in the British press, there is a higher tendency to warn people of the train travelling too fast, resulting in the risk of a disastrous end to the journey, while the German press instead highlights the decelerating effect of the train brakes. In another study on the NATION (STATE) IS A BODY metaphor in political discourse, Musolff (2017) shows that this generic metaphor, in English, German, as well as French, includes the aspects of LIFE CYCLE, ANATOMY-PHYSIOLOGY, STATE OF HEALTH, INJURY, and THERAPY. Now, in English discourse, the physical body of a prominent politician may be the ostensive target referent of the phrase *body politic*, while in Germany, the quasi-technical term in Nazi ideology *Volkskörper* ('people's body') is frequent because of the critical attention paid to Nazi-reminiscent vocabulary. Conversely, in French, *corps politique, corps électorale*, and *corps social* can be traced back to Rousseau's impact on revolutionary and republican thought.

Economy is another target domain that has been exploited with respect to conceptual metaphors, forming guidelines for action in companies, as well as constituting templates for framing business and negotiation in general. Koller (2004) takes the entrenched conventional metaphor BUSINESS IS WAR as a starting point for the elaboration of more specific sources for action fields such as WAR, SPORTS, and GAMES for marketing and sales, and FIGHTING, MATING, and FEEDING for mergers and acquisitions, although WAR metaphors are three times more frequent than MATING ones. She reveals that conventional expressions of those domains are most common, but also entire metaphoric scenarios, as well as novel realizations, such as "Dell's efficiency jihad", are frequently used. Koller interprets the results from her study in terms of their expression of capitalist and masculine views of business. Boers and Demecheleer (1997) have analyzed source domains in economic discourse based on corpora of English, French, and Dutch, revealing that HEALTH and WAR metaphors are more frequent in French and Dutch, whereas in English, PATH metaphors are prevalent; a result that is linked to the seafaring past of the United Kingdom. According to the authors, cultural models are also responsible for the higher number of GARDENING metaphors in the British corpus as compared to the French corpus, in which FOOD metaphors are five times higher in use.

The fundamental question to what extent our academic discourse is biased due to metaphorical perspectives had been discussed long before Lakoff and Johnson by philosophers, anthropologists, and even theologians since the 17th century; it would go beyond the scope of this chapter to present them all (Schröder 2012). Hans Blumenberg (1998 [1960]) might be the most prominent figure, who approached metaphor by his well developed 'epistemological metaphorology' by which he strives to uncover the overarching paradigms of each period in philosophical discourse. Metaphors direct our attention to certain aspects of the world (*Sichtlenkung*) and form 'guiding models' such as TRUTH AS LIGHT OR ACTOR, the WORLD AS LIVING BEING, CLOCK, SHIP, THEATER, OR BOOK (Blumenberg 1998 [1960]), REAL HISTORY AS NARRATION, LIFE AS SEAFARING, TIME AS SPACE, and DOCUMENTS AS SOURCES (Blumenberg 1971). In a similar vein, the text linguist and literary scholar Harald Weinrich (1976) points to compounds dominant in literature studies such as LOVE AS FEUDAL SYSTEM in courtly love lyric (*Minnelyrik*) or LANGUAGE AS PLANT, WORD AS COIN OR BUILDING BLOCK, and TEXT AS WEB in linguistics. The work of Lüdemann (2004) is directed to the different paradigms of sociological theory and discourse, such as the current idea of SOCIETY as a SYSTEM that is related to the idea of NATION AS SPACE, as well as the 19th-century concept of SOCIETY AS ORGANISM and the 17th-century idea of SOCIETY AS CONTRACT.

In the first decade of the 21st century, a new field of discourse studies was established by what Forceville and Urios-Aparisi (2009: 5) have called 'cognitive semiotics' or 'multimodal discourse', with analyses that take as their database comic strips, cartoons, advertising, video games, music, and film. This implies irrevocably leaving the grounds of static and entrenched metaphors since "the A is B formula disguises the dynamic nature of metaphor" (Forceville & Urios-Aparisi 2009: 12). Forceville (2008: 469–475) distinguishes three types of metaphor in advertisements: (i) 'pictorial metaphor' whose target and source are entirely rendered in visual terms, such as the prominent example of the integrated metaphor COFFEE MACHINE IS A SERVANT: Through the curved shape of the reservoir and a platform on which the cups must be placed, the object coffee machine suggests a servant or butler courteously serving coffee; (ii) 'multimodal metaphor', e.g., an advertisement for a Dutch TV channel showing a hybrid object simultaneously representing a Swiss army knife and a remote control pad with the *Avante* logo, accompanied by the text "Avante. A TV channel to explore. Space travel · military forces · submarines · motors · aerospace · expeditions · cars · boats · inventions." While source and target of the metaphor REMOTE CONTROL PAD IS SWISS ARMY KNIFE are already present in the hybrid image, the text helps to identify the remote control pad as being part of the metaphor and qualify the product as a typical 'boy's toy'; (iii) 'embedded multimodal metaphor', e.g., a short animation film that renders various embedded metaphors non-verbally by showing a baby growing into an old man, meeting many people, and adding all new insights and experiences garnered from these meetings in the form of pictograms into a balloon over his head, until the balloon becomes a weight under which he almost collapses as an old man. The film connects a variety of metaphors: LIFE IS A JOURNEY, KNOWLEDGE IS UP, DEVELOPMENT IS UP, as well as EXPERIENCES ARE A BURDEN. Schröder and Carneiro Mendes (2018) draw their attention to the TV series *The Wire* (2002–2008), an epic based on real police reports broaching the issue of the illegal drug trade constituting subuniverses in the post-industrial city of Baltimore. The authors not only illustrate how Forceville's 'multimodal metaphor' becomes visually and linguistically rich in the series by the overarching key GAME metaphor, but also how Kövecses's (2010) context-sensitive grounding model of metaphorical creativity can be applied to several particular situations at stake. In one sequence of the series, two young drug dealers of the Barksdale's drug area play a game of checkers with chess pieces and the young boss of the crew members passes by; he teaches them by explaining the rules of chess, in which he refers to the drug business and the positions of people involved. This mini-narrative (Forceville & Urios-Aparisi 2009: 12) multimodally inverts source and target, and the 'context-induced metaphor' (Kövecses 2010) CHESS IS THE BARKSDALE DRUG BUSINESS ORGANIZATION emerges in the discourse space.

While multimodality has begun to broaden the focus of discourse genres, corpus linguistics has brought discourse studies to a new era concerning metaphor as being systematically analyzed in large quantities of naturally-occurring data, as opposed to the introspection method by the first generation of CMT.

Concordancing tools provide each instance of the search term in the corpus on a separate line, accompanied by the immediately preceding and following co-text, and, additionally, tools such as the USAS also annotate words according to their semantic domains. This can lead to identifications of a much wider set of metaphors, as Semino (2017) shows in the case of WAR-related metaphors for cancer. The results include not only the lexeme "war" but also expressions such as "chemo veteran" and "invaders" for cancer cells. Based on the British National Corpus (BNC), Stefanowitsch (2005) investigates the distribution of 'city in the {center/heart} of NP', revealing that *city* occurs about twice as frequently as expected in the metaphorical pattern. The metaphorical use of *heart* is motivated by the metaphorical mapping THE CENTER IS THE HEART, being part of the more general OBJECT-AS-ORGANISM metaphor. By showing this tendency along a series of patterns, Stefanowitsch concludes that this metaphor preference occurs due to gestalt principles: small entity, simple shape, clear boundaries, concrete object or action. Similar to the study of Stefanowitsch (2005), Deignan (2005, 2008) shows how linguistic metaphors are constrained by their co-text. Corpus analysis reveals, for example, that the metaphorical meaning of "at any price" is more usual than its literal meaning, which always occurs concurrently with the presence of a lexeme from the semantic field of buying and selling. She also provides evidence from the Bank of English corpus that metaphorical evaluations may depend on different morphological inflections of a lexeme in real discourse. Whereas the singular noun "rock" rather has a positive metaphorical meaning ("a rock of stability"), the plural "rocks" tends to have a negative meaning ("ending up on the rocks").

Another way of refining methodology for finding metaphor in real usage that is of high relevance for discourse studies is represented by the Pragglejaz procedure (Steen et al. 2010), the MIP or MIPVU (Metaphor Identification Procedure VU University Amsterdam), that is used to identify a metaphor in context as such when the lexeme or phrase has a more basic contemporary meaning that is related to bodily action, concreteness, or preciseness, and, in general, is historically older. On her part, Lynne Cameron has developed an even more dynamic metaphor-led discourse approach in a search for 'metaphoremes', based on the insight that metaphoremes go beyond representational matters and should rather be conceived as patterns of linguistic, affective, cognitive, and pragmatic features (Cameron 2008). In her study on 'reconciliation talk' between the perpetrator of violence and the son of one of his victims, Cameron shows how JOURNEY and SEEING metaphors are mixed and developed into a coherent metaphorical scenario that shifts from vehicle expressions such as "glimpsing" to new antonyms such as "lock out", thereby stressing the contrasting aspects stemming from different domains (*SEEING* versus *MACHINE* metaphors) (Cameron 2016). As the author claims:

> In talk, metaphor is a shifting, dynamic phenomenon that spreads, connects, and disconnects with other thoughts and other speakers, starts and restarts, flows through talk developing, extending, changing. Metaphor in talk both shapes the ongoing talk and is shaped by it.
>
> *Cameron 2008: 197*

Likewise, Charteris-Black (2016) examines metaphors coming from interviews with people who have experienced chronic pain and use complex metaphors to describe it, ranging from repeated, extended, elaborated to mixed metaphors. He states that mixing metaphors occur mostly in the language of people who have experienced chronic pain, emphasizing the intensity of the embodied experience as 'out of control'. The clash of source domains symbolically re-enacts the chaotic and

disruptive experience. Conversely, repeating or extending metaphors is more likely to be used when the therapy or medication is successful (see also Semino 2017).

Finally, as a synthesis of spoken language analysis and multimodal approach, recently upcoming work on metaphor and gesture is dedicated to the fine-grained analysis of online production of metaphors. Cienki and Müller (2008) draw attention to verbo-gestural metaphors in interactional discourse focusing on metaphoricity as dependent on the dynamic flow of the speaker's focal attention so that metaphoricity turns into a question of sleeping and wakening metaphors. While monomodal metaphors only occur on one level—linguistically or gesturally—source and target of multimodal metaphors are predominantly represented in both modes co-expressively. The authors give the example of a woman who describes her teenage lover as becoming more and more clingy while concurrently opening her palms and closing them repeatedly. When someone states: "Either you're right you're wrong y'r black y'r white y'know", concurrently sweeping the right hand from left to right, the verbal metaphor relates to BLACK/WHITE whereas the gestural metaphor chooses the LEFT/RIGHT orientation, both mapped onto RIGHT/WRONG. Yet a monomodal metaphor is minimally activated while a multimodal metaphor generally is highly profiled and additionally frequently foregrounded by further means, such as marked prosody, speech pauses, lexical tuning devices, expansive use of gesture space, gaze direction, or metacommunicative gestures that place a metaphoric expression in the visual space (Cienki 2008; Müller & Tag 2010: 94–100). Additionally, Müller (2008) also focuses on the pragmatic impact of metaphoric gestures, since they not only fulfill referential but also performative, as well as metanarrative functions. Thus, the palm-up-open-hand gesture may present an argument as obvious to the hearer, the brushing aside gesture may move an unpleasant argument away, and frequently goes together with discourse markers such as "anyway".

3. Metonymies

Metonymy has been understood as a "cognitive process in which one conceptual entity, the vehicle, provides mental access to another conceptual entity, the target, within the same idealized cognitive model" (Kövecses & Radden 1998: 39). That is to say, while metaphor establishes symmetrical correspondences between two domains, metonymy sets correspondences in an asymmetrical way "by conceptually *foregrounding* the source and by *backgrounding* the target" (Barcelona 2002: 226). For Littlemore (2015: 22–41), the taxonomy of metonymy, as proposed by Radden and Köveceses (1999), serves as a starting point for distinguishing between WHOLE AND PART as well as PART AND PART metonymies in real world data in order to describe their function in discourse, based on occurrences in the Bank of English, the BNC, as well as the WebCorp: She reveals that the predominating PHYSICAL PART FOR WHOLE metonymies mostly involve body parts. Often, tokens such as "The *hired hands* are here" (BofE) have strong depersonalizing effects as they reduce the individual to his or her most relevant attribute, what is also prevalent in sexism where metonymies are particularly offensive due to the imagery they evoke: "I couldn't bear the way men regarded me as just a *pair of legs*" (BofE). Another salient type of metonymies in real discourse are those involving the 'constitution ICM' as reflected in the token "He presented a *paper* to the Cambridge Philosophical Society" (BofE). Here, an object's constitutive material is used to refer to the object itself, and the metonymy reflects the necessary knowledge of the particular meaning attached to language by different discourse communities as an important prerequisite to its comprehension. The grammatical form of use can also point to the discourse function of the metonymy. Compare "Yoko had a separate closet just for her *furs*" (BofE) with "Politically-correct women can no longer wear *fur*" (BofE). The use of the plural form in the first token emphasizes the fact that the wearing of fur indicates wealth whereas the use of the singular form in the second token evokes a disapproving context in which *fur* is evaluated negatively. In the category PART FOR PART metonymies, Littlemore

shows that PRODUCER FOR PRODUCT metonymies in tokens such as "He decided to buy himself a *Rolex*" are frequently used for expensive, high-quality products. Place for inhabitants metonymies often have a strong hyperbolic effect and can create 'feel-good stories' by tokens like "The *entire village* is expected to give samples at a local blood unit" (BofE).

Work on the relationship between metonymy and metaphor has been initiated by the pioneering study of Goossens (1990) who coins the concept of 'metaphtonymy' to refer to the two frequent phenomena of 'metonymy within metaphor' (*bite one's tongue off*), as well as 'metaphor from metonymy' (*close-lipped*). While Goossens still links his concept to the small scale of particular expressions, Denroche (2018) introduces the term 'text metaphtonymy' in order to refer to discourse as illustrated by an ad on the London Underground for recruiting volunteers for the London 2012 Olympic Games:

> You know when your mum's coming round to your flat and you give the place a quick tidy? Well that's exactly what we're doing. Except our 'flat' is London and our 'mum' is the rest of the world coming round. So we're cleaning London in time for the London 2012 Olympic Games. But that's a big job so we're asking people like you to lend us a hand. *We have litter to pick, graffiti to scrub, and flowers to plant*. […]
>
> *Denroche 2018: 7*

The ad is composed by the extended metaphor LONDON IS A FLAT and additionally includes an embedded 'metonymy cluster' with the list of tasks which have to be carried out before the games begin.

Corpus data (Deignan 2005; Charteris-Black 2003; Deignan 2008) have revealed a large number of linguistic expressions to be generated by the interaction between metonymy and metaphor, possibly higher than either pure metaphor or pure metonymy. Additionally, the boundaries are not always as clear as the introspective examples given by the first generation of cognitive linguistics suggested. Deignan (2008: 192) illustrates this point based on occurrences found in real data related to the expression 'to keep an eye on': (i) "This means that while Julia is cooking she can still *keep an eye on* their two young children" (metonymy); (ii) "Often a scheme will need backing for several years. During this time the Director [will] *keep an eye on* its progress" (metaphor from metonymy); (iii) "[The job] entails collecting the rent and *keeping an eye on* some housing association flats" (unclear). In a comparative corpus study between key linguistic body items in English and Italian, Deignan and Potter (2004) examine the lexemes *nose*, *mouth*, *eye*, and *heart*, as well as their Italian equivalents *naso*, *bocca*, *occhio,* and *cuore*. The most striking finding is that the most common usage occurs as an interaction of metaphor and metonymy, e.g., in metaphorical expressions, metonymically grounded and post-modified, such as *mouth of the river*. The majority of expressions in both languages are derived from metonymic uses such as *mouth*/*bocca* standing for speaking or eating, as in the conventional expressions *put words in someone's mouth*, *mouth-watering*, or *live hand to mouth*.

Almost all studies on multimodal discourse following the theoretical framework of Forceville and Urios-Aparisi (2009) have thrown new light on the interaction between metaphor and metonymy. Hidalgo-Downing and Kraljevic's (2013: 164–168) work on 52 advertisements for information and communication technologies published at the beginning of the 21st century illustrates that point. One ad shows a close up of a green light on a red background in a square form underneath a larger green square which contains the text:

> *Dreams made real.*
> More superhighway, less road rage. Data jams. Internet interruptions. Drops. Crashes. Seems like it's always rush hour out there. But with Agilent systems and technologies,

> the world's major communications networks move faster, handle more, avoid trouble and merge effortlessly. Happy motoring.
> Agilent Technologies.
> Innovating HP way.
>
> *Hidalgo-Downing & Kraljevic 2013: 166*

The basic metonymic chain implies (i) the green traffic light that stands for the whole traffic light in a part-for-whole relationship, and (ii) the whole traffic light that stands for the permission to start moving in an instrument-for-action metonymic relationship. Additionally, these metonymies give access to the two metaphors related to the interaction of image and text: INTERNET IS A HIGHWAY, and THE ADVERTISED ICT COMPANY IS A GREEN LIGHT.

In the field of gesture studies, the work of Mittelberg and Waugh (2009, 2014) has shown that most metaphorical interpretations of gestures inherently involve the interpretation of metonymy as a first step whereby gestural sign formation comprises abstraction as "the singling out of salient features or decisive moments of entities, ideas, actions, or events whether experienced many times before or imagined for the first time" (Mittelberg & Waugh 2014: 1747). Thus, the transition from literal to metaphorical understanding in the case of a hand gesture drawing a frame of a story proceeds in a first step by drawing traces of angles in the air that give a hint for the frame as a whole. Then, in a second metaphoric step of meaning construction, this frame might be interpreted as the frame of a story being told (Mittelberg & Waugh 2009: 337).

4. Blending

Fauconnier and Turner's work is the indispensable starting point for dealing with blending in discourse. Fauconnier (1997: 192) gives an example from a newspaper's editorial to discuss our enormous capacity to perform significant creative online blending in everyday action and speech: "The U.S. is in a position to exhume itself from the shallow grave we've dug for ourselves". Like many blends in everyday discourse, this comment builds on the conventional grave-digging metaphor concurrently elaborating a novel blend, in which the depth of the grave is mapped onto the seriousness of the difficulties, while the grave digger is represented by a dead individual who resurrects by being exhumed. Fauconnier and Turner (2002: 65–67) also pay attention to multimodal discourse. In their classic 'Bypass' example, one sees an ad by the Education Excellence Partnership Website, 2001, that is meant to persuade readers to support the fight against falling standards in American schools. The ad shows three doctors in an operating room who are, however, only about seven years old. It says: "Joey, Katie and Todd will be performing your bypass". Below the picture the ad explains that doing anything sophisticated requires sophisticated learning, but that America's kids are getting dumbed-down curricula. The authors analyze the ad by showing that in a first input space, one can find children yet to be educated, while in the second input space, one can find doctors with a formal education. The conceptual integration network created here compresses relations on a cause, space, identity, change, and time level inside the blend. Turner (2015: 225–228) argues that ads and posters as multimodal discourse sources generally contain projections of deictic and indexical communicative elements providing a very tight compression for a vast mental web as a "set of mental spaces that are activated and connected as one is thinking about a topic" (Turner 2015: 212). For instance, 'the face' of 'Uncle Sam' 'looking out' of the recruiting poster, and pointing his finger, saying "I want you for U.S. Army" represents such a compression *par excellence* since there is no single Uncle Sam, no particular 'I', no particular 'you', and no particular discourse directed to one person only.

Although blending theory is concerned with online production, it has been criticized that it is limited to cognition, leaving out interactional phenomena by extracting and isolating the expressions it wishes to analyze from all communication contexts (Brandt & Brandt 2005).

Schröder's (2015) more complex and comparative study on written and spoken Brazilian and German discourse about society, 2005–2008, has unveiled for the German data a much greater tendency towards activated 'compound image schemas' that also might be described as conceptual blends. These correspond to the changes that German society had undergone at that time, such as VERTICALITY + PATH, CONTAINER + PATH, or VERTICALITY + CONTAINER + PATH. However, a closer examination of discourse-specific scenarios revealed how semiotic blends attain context-specific, semantic-pragmatic relevance through online constructions. The Brazilian data contained blends characterized by higher imageability, like personification, and fewer image-schematic blends. Schröder underscores how the extension of blending theory by semiotic elements—such as the 'relevance space' that integrates the whole setting in which communicators have certain intentions and negotiate meanings (Brandt & Brandt 2005)—is as essential for an appropriate understanding of the contextual and cultural character of such integration networks as the extension of a discourse perspective on conceptual blending for the description of innovative moments with a high and more elaborated metaphorical density.

An important contribution to the study of the discursive development of meaning construction is exemplified by Oakley and Coulson (2008) who conduct an analysis based on a radio interview with the former White House Special Advisor on Counterterrorism, Richard A. Clarke, in which the conventionalized expression 'connecting the dots' is creatively elaborated. The interviewer introduces the expression by asking whether the different agencies—FBI, CIA, and NASA—were unable to "connect the dots", referring to an already conventionalized use of this phrase in the 9/11 context. Additionally, the expression has an entrenched literal meaning because of the game Connect the Dots, as well as in relation to the entrenched conceptual metaphor KNOWING IS SEEING. Later, Clarke denies the position of another politician by insisting: "but there are some *dots* that *come out screaming at you*". In this blend, the dots are not pieces of a larger picture, but sentient beings in their own right participating in 'fictive interaction' that emerges "from the intersection of cultural, linguistic, and situational knowledge in the service of the interconnected demands of discourse coherence and argumentative goals" (Oakley & Coulson 2008: 47). Pascual (2008) reveals how 'fictive interaction blends' emerge in institutional interaction as simplex blends resulting from the conceptual integration of a mental space with the frame of face-to-face conversation as occurring in court interaction. Based on official court transcripts, televised material, as well as ethnographic notes from three high-profile murder trials in the USA, she shows that closing argument rebuttals construct such scenarios in which, for example, a plaintiff lawyer 'responds' directly to the prosecution team as if it were present and as if the speech were not directed towards the members of the jury but to the judge or the defense counsel, who in fact could have talked one or two days before (Pascual 2008: 84).

5. Constructions

Construction grammar holds that grammatical knowledge involves form-meaning pairs not compositionally derivable by their parts and exhibiting varying degrees of schematicity ranging from lexically specific to fully schematic, so that the classic opposition between syntax and lexicon no longer stands (Goldberg 2006: 5). For more or less three decades, research on constructions was strictly limited to introspectively generated examples before there was a rising interest in the interactional meaning and function of constructions in discourse where they are not simply instantiated as 'prepackaged wholes'. Both research areas, CxG, as well as CL, maintain a non-reductionist and maximalist approach working holistically by integrating syntactic, prosodic, lexical, pragmatic, sequential, and gestural information into the turn-constructional units or constructions (Auer 2006: 291–294; Fried & Östman 2005). Fried and Östman (2005: 1763–1773), for example, have studied the Czech National Corpus (PMK) and describe how the subordinating conjunction *jestli* introduces 'quoting questions', 'polite

questions', as well as 'rhetorical questions' in spontaneous discourse. The authors establish a functional map of *jestli*-patterns concluding that all uses have to do with the conceptual idea of expressing indirectness. Auer (2006: 304–311) observes 'bipartite constructions with projecting *so*' in German on the basis of examples from the first season of *Big Brother* in Germany, as well as job interviews and group discussions. His results reveal uses of *so* (i) as a quotative particle in displaced speech: "und ich *so*" ("and I like"); (ii) as a pre for 'big packages': 'es IST so' ('it IS like'); (iii) or as a degree-consecutive construction: "ich bin: — *so* weit Untn; ich KANN einfach gar nimmer weiter runter" ("I'm so down I can't go any deeper"). Having only one part, such as in "s=is mir *SO* WURSCHT" ("I don't care at all"), the construction turns more evaluative and *so* functions as an emphasis particle. Based on 100 tokens of three different German corpora, Deppermann (2006) analyzes 'deontic infinitive constructions' which correspond to a grammaticalization of elliptic modal constructions which express (i) the act of 'giving permission' as in "erst hausaufgaben dAnn fernsehen" ("first homework, then watching TV"), said by a father to his son; (ii) the act of 'complaint', such as "jetz machste- (-) hh erst mA: l dein zImmer"—"Immer Aufräumen" ("now you'll first do you room"—"always tidying up"), as a son's answer to a father's request; (iii) or "jetzt den kopf zu mIr drehen" ("now move the head towards me"), as the act of a 'request' formulated by a doctor. One effect of 'deontic infinitive constructions' is the indetermination of the agent which bears rhetoric advantages as opposed to modal constructions or imperatives (Deppermann 2006: 242–249).

Construction grammar has only recently started to extend the analysis of larger-than-the-sentence patterns. Hence, there are also bigger units forming 'constructional discourse', such as Wellerisms which are sayings of the form "*It all comes back to me now*, said the captain, as he faced into the wind". They demand specific circumstances that have to hold. In the Swedish context, (i) as a responsive act (interaction) they sequentially follow what someone else from the same community has said to enhance camaraderie; (ii) they are used to anchor the speakers to a joint cultural history (coherence); (iii) additionally, they include affect (involvement). These factors have to be described together with other factors such as (iv) discourse patterns (recipes, fairy tales, etc.); (v) particular activities (argumentative, descriptive, narrative, etc.); (vi) grounding (figure, ground); (vii) nonverbal aspects (gestures, position, gaze); (viii) sociolinguistic variables (age, gender, education, etc.) (Östman & Trousdale 2013). Antonopoulou and Nikoforidou (2011) claim that discourse patterns could be seen as contexts of expectations we can easily find in telephone-call openings, as conversation analysts have shown. The construction in this case is composed by (i) a semantic frame: a telephone call among friends; (ii) discourse roles and actions: summons-answer, identification-recognition; (iii) elliptic fixed formulas, declaratives and interrogatives; and (iv) drop-lists: "hello", "This is X", etc. How to integrate the situational context of discourse in the study of constructions in interaction is a question Fischer (2006) has addressed. In contrast to conventional formulas such as "get well" that are stored as stable, fixed patterns and whose meaning is immediately activated by a specific frame, other expressions are situationally embedded. She illustrates her point by an analysis of the particle *okay* in interactional discourse that roughly reveals tokens related to an 'okay-check', an 'okay-agree', an 'okay-feedback', an 'okay-framing', an 'okay-comply', as well as an 'okay-repair' (Fischer 2006: 349–354). In a further study, Fischer (2015) analyzes the construction "oh" (Heritage 1984) with its cognitive meaning as a construction in the interactive exchange that can be schematized in four steps:

A: repairable
B: repair initiation/understanding check
A: repair/confirmation/disconfirmation
B: *oh*-receipt

"Oh" indicates that the speaker has undergone some kind of 'change of state' and fulfills an interactional task, since it is regularly followed by an assessment, so that it results in the schema '*oh*-PLUS-ASSESSMENT' after informing, as a form-meaning pair (Heritage 2005; Fischer 2015: 569).

6. Viewpoint

The experience of alter ego's actions builds the underlying basis for our ability to treat other humans as conscious social agents like ourselves. As a consequence, language prompts us to 'run' simulations in the brain which are necessarily viewpointed, and communication activates the embodied neural system's representation of viewpoint. According to Sweetser (2012), the following range of factors compose a linguistic viewpoint: (i) local reference of speaker and addressee (*here*, *there*, etc.); (ii) temporal reference of speaker and addressee (*now*, *tomorrow*, etc.); (iii) what the speaker and addressee are assumed to *know*, *think*, *presuppose*, etc.; (iv) reference identity (determiners *a*, *the*); (v) speaker's construal of the social interaction (address forms, honorific markers); (vi) epistemic stance (connectives and evidential markers *if*, *when*, etc.); (vii) speaker's assumption (presuppositional lexical items); (viii) what speaker and addressee feel; (ix) framing (someone is *thrifty* as opposed to *stingy*); (x) speaker's emotional assessment (affective markers). As an example, take the social viewpoint that shifts when a senior male university professor at the Sorbonne is about to introduce an honored speaker who is concurrently his friend. As they chat before the talk, they address each other by first names and use the informal French second-person pronoun *tu*, but switch to *Professor X* using the formal address pronoun *vous* when the official welcome over the microphone initiates implying "the others" viewpoint (Sweetser 2012: 8–12).

In discourse studies, 'viewpoint' is of critical importance as the conceptualizer's perspective on an event or a scene can be understood as the way a language user is mentally simulating the event he or she is reporting. In direct speech, for example, in "The man said, I ate a lobster" the quotative prompts the listener to shift viewpoint from the 'Base Space', that is, the speaker's reality, to the 'Story Space', that is, the referent's reality (Parrill 2012: 98–102). Nikiforidou (2012) has studied narrative, monologic text types that reveal a construction prototypical for the 19th-century novel: the co-occurrence of a past tense verb with a proximal temporal deictic as reflected in the 'Past + *now*' construction including a shift in perspective from the narrator to a vantage point close to or inside the narrated event(s). Additionally, Vandelanotte (2012) relates viewpoint to direct, indirect, and free indirect speech or thought involving different degrees of narrator's influence in speech and thought of the agent: While direct speech or thought (DST) indicates a complete deictic shift to the represented speaker's deictic center, free indirect speech or thought (FIST) is typically characterized by a partial deictic displacement, such as the 'Past + *now'* construction reflects. Indirect speech and thought (IST) also allows a minimal shift. Vandelanotte introduces 'distancing indirect speech or thought' (DIST) as a further step on this cline, where typically the reported material is presented from the single deictic viewpoint of the current speaker in a syntactically freer kind of syntax. Compare: "John will be late, he said" (current speaker's viewpoint but other's source—DIST) versus "He would be late, John said" (represented speaker's viewpoint—FIST). According to Vandelanotte (2012: 210–211), the 'discourse distance' inherent to DIST allows the current speaker to use the submerged represented speaker's thought or utterance for current discourse purposes, such as providing evidence or expressing irony.

McNeill (1992: 118–119) was one of the first to attend to viewpoint in gesture. In his psychological-cognitive but also interactional-pragmatic approach to gesture he distinguishes two ways in which gestures could convey viewpoints of actions that are being described: either by the Character's Viewpoint (C-VPT), by which the narrator in discourse adopts the perspective from the inside of the story and, for example, moves his arms up and down, as if climbing a ladder. In opposition to that, he could also make the hand form the character as a whole and causes it to rise upward, not being part of the scene, incorporating an Observer Viewpoint (O-VPT), keeping distance from

the story itself. That is, an O-VPT gesture excludes the speaker's body from the gesture space while the C-VPT is participative. Narrators occasionally combine O-VPT and C-VPT gestures simultaneously, creating Dual Viewpoint gestures (McNeill 1992; Parrill 2012). Applying viewpoint to gesture in discourse in order to advocate an embodied and multimodal understanding of language, cognition, and interaction, is a current field of research gaining more and more attention. Mittelberg (2017) follows McNeill's and Parrill's insights on dual viewpoint and illustrates how multiple viewpoint construction is realized in experiential immersion when people describe spatial experiences, e.g., regarding their childhood memories about their living space. One German architecture student describes how she went down the staircase every day to get to kindergarten from a 'mixed viewpoint': the speaker's body, head, and eye gaze show someone observing a scene from above, but at the same time, her index finger portrays her own action from the observer's viewpoint while she is verbally describing it in detail using the first-person singular. In addition to gesture, Sweetser and Stec (2016) show the importance of different multimodal articulators such as hands, torso posture, as well as head orientation, and especially face expression and gaze, as indicating viewpoint shift during oral narrations. These include discourse uses of gaze marking memory access by looking upwards or downwards demonstrating 'thinking', 'checking' for approval from an interlocutor, as well as content uses such as alternation between enacted character's gaze. While hands, for example, can act in the Story Space by representing an official's document-holding activity, the narrator's face and gaze may be turned away from the Story Space towards the Real Space interlocutor to answer an interpolated question. This is called 'viewpoint embedding': "Both narratorial body and character body are enacted simultaneously, and the result is a vivid embedding of one embodied viewpoint within another" (Sweetser & Stec 2016: 240).

7. Discourse Models

As we have briefly seen in the introduction, there are also a few attempts to present cognitive frameworks for discourse analysis as a whole. Langacker's (2008) path-breaking work on discourse has set the agenda for basic concepts. Of crucial importance is Langacker's (2008: 466–468) 'current discourse space' (CDS) as a mental space comprising those elements and relations construed and shared by speaker and hearer as a basis for communication at a given moment in the flow of discourse. It is composed of a 'viewing arrangement' constituting the relationship between the conceptualizers and the object of conception. A situation described can be observed, recalled, or imagined, and the interlocutors participating in a profiled relationship have a dual role as both subject and object of conception. Two further important principles for Langacker (2008: 493) are coherence and cohesion. He understands discourse as the construction of a mental path from given to new with the subject as an accessible starting point of departure. Thus, he explains why "I looked in the kitchen. Several dead rats were on the counter" sounds odd while "I looked in the kitchen. On the counter were several dead rats" works well: The counter is already accessible in the CDS, although not explicitly mentioned. But the kitchen has been introduced, and one expects to find a counter in it. Hence, with attention focused on the kitchen, the counter becomes an accessible location.

Langlotz (2015) takes Langacker's CDS model and connects it with CG and Barsalou's dynamic model of situated conceptualization to sketch a grounded socio-cognitive model of meaning construction in context. His aim is to bridge the gap between situated interactional negotiation of meaning, on the one hand, and discursive knowledge that underlies speech genres in the form of genre-simulators, on the other. In order to illustrate his point, he discusses two sequences in a Swiss tourist office; one sequence follows a prototypical script while the second one deviates from it, thereby revealing how institutionalized talk-in-interaction is managed locally and opportunistically. According to Langacker's CDS, the local management of a conversational turn follows

the 'prospective' and the 'retrospective' orientation of a linguistic expression. Speaker and hearer engage in joint orientation towards a referential entity that is in their mutual focus of attention, called a 'viewing frame'. By mutually engaging, interactively negotiating, and coordinating their reciprocal instructions to modify the CDS, the communicative partners can dynamically construe complex structures of meaning. Barsalou's (2005) model of situated conceptualization helps understanding that when activating a concept in a specific situation, cognizers re-enact perceptual experiences in the form of situated conceptualizations by 'simulations'.

Hart (2015: 327–329) builds on Croft and Cruse's (2004) construal operations classified as instantiations for four general cognitive principles: (i) Gestalt, (ii) Comparison, (iii) Attention, and (iv) Perspective, to which four 'discursive strategies' correspond: (i) structural configuration strategies involve the imposition of a particular image-schematic representation; (ii) framing strategies concern the attribution of particular qualities to entities, actors, actions, relations, and processes; (iii) identification strategies concern the salience by which social actors are represented in the conceptualization; (iv) positioning strategies can be spatial, temporal, or modal, and are related to viewpoint. According to Hart, all cognitive principles and discourse strategies bear ideological potential. As an example take (iii) Attention: Profiling invokes an ACTION schema. However, an agentless passive construction profiles only that portion of the schema downstream of the PATIENT, as can be seen in the headline: "Seven killed in Afghanistan Koran burning protests", in which the agents of 'killing' are not specified.

8. Conclusion

The chapter has aimed to provide an introduction to the development of discourse studies in the research field of cognitive linguistics. Three specific objectives have been proposed: (i) to show how the variety of concepts used for approaching discourse has considerably increased during the last 20 years. Hence, we cannot talk any longer about metaphor as being the overall dominating cognitive tool for doing discourse analysis; (ii) to widen the scope with the aim of showing that discourse studies go beyond the mere critical discourse analysis perspective; (iii) to illustrate how interactional spoken and multimodal discourse approaches set a new agenda and new challenges for current studies, as well as for the future.

Notes

1 The phonologist Gerold Ungeheuer (1979: 97) introduces both terms assuming that every human being experiences communication twice: (a) as a communicator during the execution of communicative acts employed to achieve reciprocal understanding; and (b) as a (self-)reflexive observer who tries to categorize and analyze the means of communication from an external point of view.

2 "Sinnstiftung, Weltdeutung und Handlungsorientierung".

Further Reading

Dancygier, B., & Sweetser, E. (Eds.). (2012). *Viewpoint in language: A multimodal perspective*. Cambridge: Cambridge University Press. (This volume brings together contributions from a cognitive perspective on narrative, literary, linguistic, and gestural phenomena revealing the role and structure of viewpoint by investigating communicative choices across various modalities and discourse contexts.)

Forceville, C., & Urios-Aparisi, E. (Eds.). (2009). *Multimodal metaphor*. Berlin and New York: Mouton de Gruyter. (This volume portrays the shift from metaphor understood as merely a mode of language towards its multimodality by taking into account written language, spoken language, static and moving images, music, nonverbal sound, and gestures.)

Hart, C. (2015). Discourse. In E. Dabrowska & D. Divjak (Eds.), *Handbook of cognitive linguistics* (pp. 322–346). Berlin and Boston: De Gruyter. (This handbook chapter focuses on discourse in cognitive linguistics, understood as language in social practice, specifically on media and political discourse, in order to show

how language functions ideologically. By doing so, it represents the most recent developments at the intersection between cognitive linguistics and critical discourse analysis.)

Oakley, T., & Hougaard, A. (Eds.) (2012). *Mental spaces in discourse and interaction*. Amsterdam and Philadelphia: John Benjamins. (This volume brings together studies in the realm of discourse as an area of research within the mental spaces and conceptual integration framework that reflects two major developments, one being related to contextual and situational factors of blending operations and meaning construction, and the other being related to its new diversity of approaches from pragmatics, text linguistics, discourse studies, and interactional studies.)

Zima, E., & Brône, G. (2015). Special issue on cognitive linguistics and interactional discourse. *Language and Cognition*, *7*. (In this special issue, articles are brought together that show how to conduct studies in the realm of spoken language from a cognitive perspective. They discuss the current state of art of cognitive linguistics with regard to interactional discourse since one basic assumption of cognitive linguistics is that usage-based models of language are grounded in multi-party language use.)

Related Topics

construction grammar and frame semantics; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; construal; grounding; multimodality

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29

SIGNED LANGUAGES AND COGNITIVE LINGUISTICS

Sherman Wilcox and Rocío Martínez

1. Introduction

Signed languages are natural human language used by deaf people around the world as their native or primary language. 'Sign language' is a broad category which includes signed languages such as American Sign Language (ASL), Brazilian Sign Language (Libras), Catalan Sign Language (LSC), and many others which are used by a relatively large community often across multiple continents, and village sign languages which arise when a number of deaf children are born into an insular indigenous community.

Signed languages are not universal; each signed language is a distinct language. Signed languages are related in language families. The French Sign Language family, for example, includes French Sign Language, American Sign Language, Brazilian Sign Language (Libras), Tunisian Sign Language, Russian Sign Language, and others. The British Sign Language family includes Australian Sign Language (Auslan), New Zealand Sign Language, Sri Lankan Sign Language, and others. Linguists have documented more than 140 signed languages. This number is likely under-representative, as new signed languages are discovered every year.

2. Historical Perspectives

A number of myths and misunderstandings have pervaded our understanding of signed languages. For centuries, signed languages were not considered to be language. Rather, they were regarded as depictive gestures lacking features of language such as phonology, morphology or word formation, and syntax.

It is often reported that signed languages are young languages. The historical and social situation in which signed languages arise and are used is undoubtedly complex. More than 90% of deaf children, for example, are born to hearing parents and thus must acquire signed languages in situations other than the home. Nevertheless, it is reasonable to assume that deaf people have always formed linguistic communities of various sizes in which signed languages were used. Pierre Desloges describes such a linguistic community in 18th-century Paris. Desloges became deaf at the age of seven from smallpox. As an adult, he wrote a treatise describing the Parisian deaf community, noting that: "There is no event in Paris, in France, and in the four corners of the world that is not a topic of our conversations" (1779, as reported in Lane & Grosjean 1980: 123–124). We have

even earlier reports of deaf signers. The Roman rhetorician Quintilian made passing reference to the use of gestures by deaf people in his *Institutes of Oratory*.

The view that signed languages are merely pantomimic gestures culminated in the debate over the use of speech versus signing in the education of deaf children that took place during the Milan Conference of 1880. Supporters of speech maintained that signed languages lacked any features of language and thus were not suited for developing the minds of deaf children. Giulio Tarra, one of the proponents of speech, proclaimed that children who are taught to sign are defiant and corruptible. He attributed this to the disadvantages of signed language, claiming that they cannot convey number, gender, person, time, nouns, verbs, adverbs, adjectives (Lane 1984). Because of this, educators maintained that signed languages cannot elicit reasoning, reflection, generalization, and abstraction. These views persisted into the 20th century, with psychologists, educators, and linguists continuing to deny the linguistic status of signed languages, maintaining that they were harmful for intellectual, educational, and language development.

Another common misunderstanding is that signed languages are representations of spoken languages—that ASL, for example, is a signed representation of spoken English. Signed languages are independent languages with their own lexicons and grammars. Like spoken languages, signed languages are naturally developing human languages. There are, however, sign systems created to represent spoken/written language. Such a system, called 'methodical sign', was used in early French deaf education and influenced the historical development of American Sign Language (ASL). The use of methodical signs was rejected in France. The first American school for the deaf, established in Hartford, Connecticut in 1817 by Thomas Hopkins Gallaudet and a deaf teacher from the Paris school, Laurent Clerc, at first used methodical signs, which had been adapted to represent written English. After only a few years of use, the system was also discarded in the Hartford school and other American schools for the deaf, citing the fact that methodical signs were burdensome and their use impeded the progress of deaf students.

The view that signed languages are merely depictive gestures and not linguistically structured was most powerfully manifest in the claim that they lack duality of patterning, that the meaningful elements of these languages are not formed from a finite set of meaningless elements. Stokoe (1960) dispelled this view with his pioneering description of the phonology of American Sign Language (ASL). Stokoe demonstrated that signs consist of analyzable units of sublexical structure. Stokoe coined the term 'chereme' for these units, the structural equivalent of the phonemes of spoken languages. Stokoe analyzed the phonology of signs into three major classes: handshape (the configuration that the hand makes when producing the sign), location (the place where the sign is produced), and movement (the motion made by the signer in producing the sign). Battison (1978) added a fourth class, orientation (the direction the hand faces when producing the sign).

3. Critical Issues and Topics

3.1 Iconicity and Signed Languages

The pervasiveness of iconicity in signed languages was widely acknowledged by early sign linguists. For instance, Klima and Bellugi (1979) state that a sign is iconic when elements of its form are directly related to visual aspects of what is denoted. Likewise, Wilbur (1987: 162) defines iconicity as "a reflection in language of the actual state of affairs in the real world". Valli and Lucas (1995: 6) regard the iconic relation to be one in which "the form of the symbol is an icon or picture of some aspect of the thing or activity being symbolized".

Even though iconicity in signed languages was recognized from the beginning, it was considered a problematic issue. Thus, these initial acknowledgements of the iconic nature of signed languages were often made in the context of reasons to diminish its role in the grammar of signed languages. Frishberg (1975), for example, showed that the iconic aspect of the signs is eroded over time, which

means that they become more opaque and, thus, arbitrary. Klima and Bellugi (1979) argued that the grammar of a signed language such as ASL submerges iconicity.

The main reason for this approach was that early research on signed languages often had an implicit goal of demonstrating that signed languages are natural, human languages. At that time, the most effective way to demonstrate that signed languages exhibit the basic properties of language was by reference to Saussure's principle of arbitrariness, as well as other structuralist principles. The observations of extensive iconicity in signed languages appeared to conflict with Saussure's claim that a defining characteristic of the linguistic sign is the arbitrary relation of *signifiant* to *signifie´*. The initial definitions by sign linguists typically viewed iconicity as a direct, non-interpreted relation between linguistic form and reality. These definitions were closely connected to transparency. According to Klima and Bellugi (1979), the most iconic signs are the ones that are highly transparent, which means that a non-signer would be able to understand the meaning of the sign from its form alone.

Once the linguistic status of signed languages was established, signed language linguists began to re-examine the concept of iconicity in the light of different theoretical assumptions. It is here that cognitive linguistics has the most to contribute to the study of iconicity. Within a broader functional paradigm, the pervasiveness of iconicity had started to be documented at different levels of spoken languages (Bolinger 1949; Haiman 1980). Iconicity soon became a topic of research within functional signed language linguistics.

Based on Langacker's theoretical model of Cognitive Grammar, Wilcox (2006) reconsiders iconicity in the light of a cognitive linguistic perspective. Wilcox claims that both semantic and phonological structures reside within a language user's conceptual space. The typical case for language is that the semantic and the phonological poles of symbolic structures reside in distant regions of conceptual space. This great distance in conceptual space is the basis for Saussure's contention of *l'arbitraire du signe*. Alternatively, when the phonological and semantic poles of signs reside in the same region of conceptual space, arbitrariness is reduced. According to this cognitive iconicity model, cognitive iconicity is defined not as a relation between the form of a sign and a real-world referent; rather, iconicity is a distance relation between structures in multidimensional conceptual space. The cognitive view of iconicity takes culture and conceptualization into account. According to this view, iconicity is not regarded as a direct relation between the form of the sign and an objective, non-interpreted reality, but as a symbolic relation that is motivated by embodied experiences common to all humans, as well as by our experiences as members of particular cultures, communities, and societies.

Within a cognitive perspective, iconicity and transparency are fundamentally different, because the former is subjectively mediated by the signer's construal of form. Occhino et al. (2017) carried out an empirical study of perceived iconicity of native and foreign signs by members of two deaf communities, American and German, who use two different signed languages (American Sign Language and German Sign Language). Signers performed iconicity judgment tasks to determine whether they showed preferential sensitivity to the iconic construals consistent with their native signed language. The results showed that the signers consistently found their native signs to be more iconic than foreign signs. These results thus suggest that the perception of iconicity is intimately related to language-specific experience and unrelated to transparency.

Iconicity in signed languages is receiving more research attention than ever before. Linguists and psycholinguists are drawing attention to the role of iconicity in language acquisition, language processing, language development, and the evolution of language in both signed and spoken modalities (Vinson, Cormier, Denmark, Schembri, & Vigliocco 2008; Thompson, Vinson, & Vigliocco 2009; Perniss, Thompson, & Vigliocco 2010; Perniss & Vigliocco 2014; Armstrong, Stokoe, & Wilcox 1995).

3.2 Metaphor and Metonymy in Signed Languages

Metaphoric expressions had been described in pioneering work in signed languages, even before Lakoff and colleagues proposed the Conceptual Metaphor Theory (Lakoff & Johnson 1980; Lakoff 1987). In the first ASL dictionary, Stokoe, Casterline, and Cronenberg (1965) devote a section to metaphor. Wilbur (1987) describes several lexical metaphors in ASL. For instance, the metaphor HAPPY IS UP is observed in signs like LAUGH, CHEERFUL, and HAPPY. The metaphor NEGATIVE IS DOWN is seen in signs such as IGNORE, LOUSY, and FAIL. Phyllis Wilcox (2000) studies metaphors in ASL discourse within the cognitive framework. She approaches the study of metaphor in lexical signs and also in more complex and creative metaphoric expressions.

Conceptual metaphor has been studied in a wide range of signed language expressions, from the most basic units to extended discourse in different discursive genres, such as Italian Sign Language poetry (Russo 2005; Russo, Giurana, & Pizzuto 2001); ASL narratives of personal experiences (Wilcox 2004a); and political discourse in Argentine Sign Language (Massone & Martínez 2013), among others.

Signed languages are highly productive in the creation of expressions based on the metonymic linking of two conceptual elements within the same domain. Several types of lexical metonymies occur in ASL and LSC (Wilcox, Wilcox, & Jarque 2003). The metonymy PROTOTYPICAL CHARACTERISTIC FOR WHOLE ENTITY appears in the signs for 'bird', 'horse', and 'cow', which depict prototypical physical properties of these animals: the beak, the ears, and horns, respectively. ACTION FOR INSTRUMENT metonymies use the action of the hands in interaction with some object to represent the instrument. The metonymy PROTOTYPICAL ACTION FOR ACTIVITY is quite productive. Here, the hands and their movement represent a prototypical action used with an object. The LSC signs DRINK-BEER, DRINK-BRANDY, DRINK-RUM-AND-COKE use specific handshapes representing an agent's interaction with a container of a specific, prototypical shape, as well as movements characteristic of drinking from these containers, to represent the activity of drinking specific types of alcoholic beverages.

Several LSC signs recruit a metonymy in which a salient characteristic of a well-known person is used to represent a more general quality. These metonymies typically involve metonymic chains. Thus, the LSC sign CHARLIE-CHAPLIN is a compound that iconically and metonymically depicts Chaplin's characteristic moustache and his particular style of moving a cane in circles. The sign is metonymically extended to mean 'person moving fast'.

Martínez and Morón Usandivaras (2013) document two conceptual metonymies that are highly productive in the creation of concrete signs in Argentine Sign Language (LSA): PROTOTYPICAL CHARACTERISTIC OF THE ENTITY FOR THE WHOLE ENTITY and PROTOTYPICAL ACTION OF THE ENTITY FOR THE WHOLE ENTITY. LSA signs such as HOUSE, TREE, and BALL metonymically depict a prototypical physical characteristic of the entity: the gable roof of the house for the whole house, the outline of the tree for the whole tree, the rounded shape of the ball for the whole ball. LSA signs such as BOAT, SWIMMING-POOL, and CHESS represent a prototypical action associated with the entity: the up-and-down movement of the boat for the whole boat, the action of swimming for the swimming pool, and the moving of the pieces of the game for 'game of chess'.

Conceptual metonymy not only has been studied in concrete signs in different languages, but also in other types of expression, such as signs related to perception (Wilcox & Wilcox 2013), name signs (Wilcox et al. 2003), and multiword units that have been created through lexicalization processes (Jarque et al. 2012).

Even though conceptual metaphor, conceptual metonymy, and cognitive iconicity are distinct phenomena, signed language researchers have found that many signed language expressions integrate these cognitive processes in quite complex ways. Taub (2001) describes many ASL lexical signs that have been created by two conceptual mappings: a metaphorical one from concrete to abstract conceptual domains, and an iconic one between the concrete source domain and the

linguistic forms that represent it. The target domain is presented using an iconic depiction of the source domain. The ASL sign THINK-BOUNCE is an example of integrating metaphoric and iconic mappings. The sign consists of an iconic depiction of a projectile bouncing off a wall and metaphorically denotes a failure of communication.

Wilcox (2000) has described a complex way in which metonymy, iconicity, and metaphor interact. The ASL sign THINK-HEARING derives from a sign that is often glossed as SAY, articulated with circular movements of the index finger at the mouth. SAY is iconic, the circling movements representing breath emanating from the speaker's mouth. The exhaled air metonymically represents the speech produced by the person. SAY has been semantically extended to mean 'hearing person'. Thus, speech is here a synecdoche in which the act of speaking stands for the hearing person doing the speaking. This meaning is metonymically extended to represent the thoughts and culture of hearing people who speak.

The sign HEARING-PERSON can be placed at the forehead, creating further metonymy and metaphor. The forehead is a metonym for the brain, which serves as an ontological metaphor for a container of thought processes. When these thought processes are considered to be a hearing person's thought processes, the extended meaning compares the deaf person's thinking with the way a hearing person thinks. The metonymic expression THINK-HEARING takes on a metaphoric mapping. The sign no longer metonymically refers to voice production, to a hearing person, or even to the extended metonym for the culture and values of hearing people. THINK-HEARING refers to a person who has at least some degree of hearing loss, but thinks like a hearing person, a deaf person who embraces uncritically the ideology of hearing people. To call a deaf person THINK-HEARING is an emotionally-charged accusation.

3.3 Mental Spaces and Blending in Signed Languages

Mental space and conceptual blending theory (Fauconnier & Turner 1996) have also been adopted for the description and analysis of signed languages. In his first approach to this topic, Liddell (1995, 2000) identifies three mental spaces used in ASL discourse: real space, surrogate space, and token space. In later work (Liddell 2003), the tripartite mental structure of space is no longer used. Instead, his proposal relies on real space and blended spaces. Also working in mental space theory, Dudis (2004) describes a construction which he terms "body partitioning". In body partitioning, a part of the signer's body is used to represent one character in a story while another part depicts a second character. For instance, to narrate the event in which a person gets punched in the face, the signer produces a conceptual integration containing two participants, the victim and the assailant, as well as a relation between the two (punch). The signer's body may become partitioned into two zones representing the two participants. If the event is narrated from the victim's perspective, the victim is mapped onto the signer, whereas the assailant is mapped onto the signer's forearm. The relationship between the two is constructed by the movement of the forearm toward the victim's jaw.

3.4 Evidentiality and Modality

Fictive discourse and fictive questions have been shown to play important roles in the linguistic realization of evidential functions in Catalan Sign Language (Jarque & Pascual 2015, 2016). Constructed dialogue may be used as an evidential strategy to express source of information. In some cases, this constructed dialogue is fictive, that is, it is a report of dialogue that never did actually take place. These researchers have also shown that linguistic elements such as eyebrow raising of the interrogative construction used for genuine information-seeking questions may also be only linguistic means of expressing restrictive and non-restrictive relative clauses.

Wilcox and Shaffer (2017) report on evidentiality in three signed languages: American Sign Language (ASL), Brazilian Sign Language (Libras), and Catalan Sign Language (LSC). They suggest that evidentiality relies on cognitive processes of simulation and subjectification. Their cognitive approach shows that evidentiality, epistemic modality, and mirativity are primarily expressed through grammaticalized facial markers in signed languages, rather than by means of manual signs.

Siyavoshi (2019) offers a Cognitive Grammar analysis of modality in Iranian Sign Language (ZEI) aimed at analyzing two linguistic channels: facial and manual. Her analysis uses two models from Cognitive Grammar, the Control Cycle, and the Reality Model, to classify modals into two kinds, effective (i.e., root or deontic) and epistemic, suggesting that effective modality tends to be expressed on the hands, while facial markers play an important role in marking epistemic modality.

In ZEI, as in many signed languages, the face plays an important role in the expression of effective modality; it is also commonly the only means of expressing epistemic modality. By positing an epistemic core in effective modality, Siyavoshi suggests that Cognitive Grammar provides a theoretical basis for these findings. Further research on modality is described in section 3.6 on signed language and gesture.

3.5 Pointing in Signed Languages

Pointing is a ubiquitous feature of signed languages. Wilcox and Occhino (2016) offer a Cognitive Grammar (Langacker 1987, 2008) analysis of pointing in signed languages. They claim that pointing is symbolically complex; that is, pointing is a construction consisting of two component structures: a pointing device and a Place (Place is capitalized to indicate that it is the name of the symbolic structure; location is the term for the phonological pole of Place). Both components of the pointing construction are symbolic structures consisting of a form, the phonological pole, and a meaning, the semantic pole. The schematic meaning of the pointing device directs attention. The schematic semantic pole thus is dependent, making reference to some autonomous element which is the focus of attention. This focus of attention is the function of the Place symbolic structure. The phonological pole of the Place is a spatial location in the current ground. The schematic semantic pole of Place is 'thing', defined quite generally as a region in some domain of conceptual space.

One construction in ASL that uses Place is the Proxy-Antecedent construction. In the Proxy-Antecedent construction, the signer produces a noun antecedent and then points to a location, thereby creating a Place and establishing a correspondence between the noun and the schematic semantic pole of the Place. The Proxy-Antecedent construction incorporates as part of its unprofiled base the expectation that the noun associated with this Place will be referred to later in the discourse with an anaphor, a point to the same Place. Thus, by directing attention to the same phonological location, the Place, the signer indicates that the semantic poles of the two Place symbolic structures conceptually project to the same entity: they are conceptually *coreferential*. Another function of pointing is nominal grounding (Martínez & Wilcox 2019). For example, the Proxy-Antecedent construction grounds a noun antecedent through the directive force meaning of the pointing device, creating a nominal and identifying it in the shared intersubjective conceptual space created by the interlocutors through their interaction in the ongoing discourse.

Martínez and Wilcox (2019) also introduce the concept of placing. In placing, rather than directing attention, signers articulate the sign at a location that falls within the addressees' focus of attention. Two types of placing are identified: *Placing-for-Creating* (create-placing) and *Placing-by-Recruiting* (recruit-placing). Both pointing and create-placing create a new Place symbolic structure, which may be later recruited in a recruit-placing construction. Pointing and placing are used for, among other purposes, tracking referents in discourse.

3.6 Signed Language and Gesture

Although linguists have demonstrated that signed languages are not simply unanalyzable, depictive gestures, recent research has begun to explore the relation between signed language and gesture. This work can be classified into two major themes: (1) the historical development by which gestures used in a hearing community are incorporated into a signed language, thus becoming fully part of the sign linguistic system, and (2) the claim that some signs and sign constructions are fusions of linguistic and gestural material, so-called "sign-gesture fusions".

The first approach is based on grammaticalization theory (Bybee 2006; Hopper & Traugott 2003). Grammaticalization is the process by which lexical material becomes grammatical material. Working within this framework, linguists have demonstrated that gestures used in the surrounding language community are incorporated into a signed language as lexical signs. These lexical signs then grammaticize, forming new grammatical signs. For example, a gesture meaning "to leave or depart" common in the Mediterranean region (Morris, Collett, Marsh, & O'Shaughnessy 1979) was incorporated in old French Sign Language (LSF) as the sign PARTIR "to leave". This sign also appears in ASL as documented in films of older signers from 1913. Both LSF and ASL also have a sign meaning "future" which is formationally closely related to the "depart" sign, thus demonstrating a grammaticalization path starting with a gesture becoming a lexical sign, and then acquiring grammatical meaning marking future (Janzen & Shaffer 2002).

Similarly, Armstrong, Stokoe, and Wilcox (1995) showed that the ASL modal sign CAN is derived from the ASL lexical form STRONG. Noting that the sign for 'strong' is very similar to CAN, Long (1918) noted that the difference lies in the way the hands are moved. For 'strength' they are moved somewhat sidewise with a slight circular motion. The source for the lexical sign STRONG is a gesture indicating strength, commonly expressed by moving the fists in an outward or downward motion so as to indicate upper body strength. Grammaticalization has been described for a number of signed languages (Xavier & Wilcox 2014; Shaffer, Jarque, & Wilcox 2011; Pfau & Steinbach 2011; Wilcox, Rossini, & Antinoro Pizzuto 2010).

Wilcox (2004b, 2009) has proposed two routes by which gesture becomes incorporated into a signed language. The first route, described above, begins when a manual gesture enters a signed language as a lexical sign and develops through grammaticalization into a grammatical morpheme. The second route proceeds along a distinctly different path. The source is not the manual gesture itself; rather, it is the *way* that a manual gesture is produced, the sign's *manner of movement*, as well as various facial, mouth, and eye gestures that may accompany a manual gesture or sign. Upon entering the linguistic system, these manners of movement and facial gestures follow a developmental path from paralinguistic (prosody or intonation) to grammatical marker.

As an example of the grammaticalization of manner of movement, in many signed languages the manner in which a modal sign is produced indicates strength of the modal. Jarque (2006) notes that manner of movement is used to indicate differences in modal strength and to mark deontic versus epistemic function in Catalan Sign Language. Modal strength is also marked in Italian Sign Language by weak or strong articulation of the base movement.

Manner of movement also grammaticizes to indicate verb aspect. Pizzuto (1987) observed that temporal aspect can be expressed in Italian Sign Language via systematic alterations of the verb's movement pattern, specifying for example the "suddenness" of an action by means of a tense, fast, short movement (e.g., the distinction between *to meet* and *to suddenly/unexpectedly meet someone*). Conversely, a verb produced using an elongated, elliptical, large and slow movement specifies that an action is 'repeated over and over in time' or 'takes place repeatedly in time' (e.g., to constantly telephone or to always be on the telephone).

The second route also characterizes the grammaticalization of facial displays. Facial displays play a significant role cross-linguistically in signed languages. In addition to expressing emotion, facial gestures mark a variety of grammatical functions such as interrogatives, topics, adverbials,

conditionals, imperatives, and more. These facial displays often begin as gestural expressions. For example, brow furrow is well documented as a display of physical or mental exertion. Darwin (1872: 221) noted that brow furrow marks "the perception of something difficult or disagreeable, either in thought or action". Brow furrow marks a number of grammatical meanings across several signed languages, including wh-questions, imperatives, and root or deontic modality.

Recently, some sign linguists have proposed that certain signs are not purely linguistic; rather, they claim that these signs and sign constructions are "language-gesture fusions" (Fenlon, Cooperrider, Keane, Brentari, & Goldin-Meadow 2019; Hodge & Johnston 2014). One such claim concerns pointing signs. Pointing signs are quite common across signed languages, functioning as deictic and anaphoric pronouns, possessive and reflexive pronouns, demonstratives, locatives, body part signs, and indicating verb agreement. The gesture-language fusion claim is most clearly made in the case of personal pronouns. Meier and Lillo-Martin (2013) observe that the first-person pronoun in ASL is fully specified phonologically, a point to the center of the signer's chest. However, they claim that the locations to which non-first person signs point cannot be enumerated in a listing of sublexical phonological units: signers point to an open-ended set of locations. They conclude (2013: 163) that

> first-person points, but not non-first points, can be specified entirely in terms of the phonological units that form lexical signs … In contrast the locations in space of non-first person points appear to be gestural in as much as the direction of pointing is—when the signer is referring to an individual who is present at the conversation—determined by the referent's physical location in the environment.

This same argument is extended to the marking of verb agreement, in which agreement is marked by location in space.

The gesture-fusion claim requires that linguists identify criteria by which gesture can be reliably and objectively distinguished from language. One proposal that has been offered (Sandler 2009) is that gestures are holistic and synthetic; they are lacking in hierarchical and combinatoric properties; they are idiosyncratic—different speakers or even the same speaker may use different gestures to represent the same image; and gestures are context-sensitive: their interpretation depends on the linguistic context. Linguistic structure, on the other hand, is componential, combinatoric, and hierarchically organized. Linguistic signs such as words are highly conventionalized in form, meaning, and distribution. Clearly, however, these criteria face problems. Language is both conventional and unconventional—innovation by definition establishes new, unconventional expressions. So is gesture: emblems or recurrent gestures are conventional, whereas idiosyncratic or innovative gestures are, by definition, not conventional. Language is gradient. As Bybee (2010: 2) observes, "All types of units proposed by linguists show gradience, in the sense that there is a lot of variation within the domain of the unit (different types of words, morphemes, syllables) and difficulty in setting the boundaries of the unit."

Another option has been to propose modality-free definitions of gesture (Okrent 2002), based on degree of conventionalization (how conventionalized must something be in order to be considered linguistic?), site of conventionalization (i.e., what kinds of conventions are linguistic conventions?), and restrictions on combination (what kinds of conditions on the combination of semiotic codes are linguistic conditions?). Answers to these questions are not offered, and indeed it is not clear how these questions can in fact be answered.

For these and other reasons not all sign linguists accept the language-gesture fusion claim. A strong rejection of the claim that gestural components are combined with language elements in essential areas of signed language grammar was offered by Dotter (2018). Recently, Wilcox and colleagues (Wilcox & Occhino 2016; Occhino & Wilcox 2017; Martínez & Wilcox 2019) have proposed a cognitive grammar account of pointing that does not require evoking gesture.

Noting these difficult issues, Kendon (2017: 30) observed that "'gesture' is so muddied with ambiguity, and theoretical and ideological baggage, that its use in scientific discourse impedes our ability to think clearly about how kinesic resources are used in utterance production and interferes with clarity when comparing signers and speakers". Kendon has gone so far as to propose abandoning the categories 'gesture' and 'sign' altogether, instead focusing on a comparative semiotics of what he terms visible bodily action as it is used in utterances by speakers and by signers.

In a similar vein, Wilcox (2019) suggests that rather than being categories that are objectively definable independent of an observer, 'language' and 'gesture' are historical-cultural constructs—that is, they are folk classifications. Determining whether a perceived visible bodily action, what cognitive linguists would term a usage-event, is 'language' or 'gesture' is a categorization problem made by a culturally- and socially-embedded language user, a matter of "what counts" as either language or gesture. Whether deaf and hearing people share the same folk classifications of "what counts" is an open question, although research suggests that the answer is likely to be quite complex, involving such factors as social-cultural background, linguistic and social context in which the judgment is made, hearing status of those making the judgment, and more (Kusters & Sahasrabudhe 2018).

4. Future Directions

The field of cognitive linguistics has contributed significantly to advancing our knowledge of the nature of the world's signed languages. Aspects that play a central role in signed languages, such as iconicity, metonymy, and metaphor, which went unexamined under structuralist and formalist approaches, have received much-needed attention from cognitive linguists. Nevertheless, much more research within cognitive linguistic theory is needed. Blending and mental space theory is only recently being applied to understanding discourse aspects of signed language. Such core areas of grammar as evidentiality, mood and modality (Shaffer & Janzen 2016), cognitive or usage-based morphology (Lepic & Occhino 2018), the windowing of attention (Leeson & Saaed 2004), referent tracking (Perniss & Özyürek 2015), and nominal and clausal grounding, require much further study. The question of what is language and what is gesture has emerged as a complex issue in signed language research. Cognitive linguistics is uniquely positioned to address this question, since it does not assume a modular view of the language faculty. General cognitive abilities are assumed to underlie linguistic ability. Cognitive linguistic theory makes it possible for future research to integrate a linguistic approach and a more ethnographic approach to how language users categorize perceptible usage events.

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Related topics

standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; iconicity; grammaticalization, lexicalization, and constructionalization; cognitive linguistics and gesture

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COGNITIVE LINGUISTICS AND GESTURE

Julius Hassemer and Vito Evola

1. Introduction

The contemporary interdisciplinary domain of gesture studies is heavily rooted in the cognitive linguistics enterprise (Evans, Bergen, & Zinken 2007), especially concerning its "cognitive commitment" (Lakoff 1990: 40), aligning gesture research within research on cognition. There is a growing body of literature highlighting that gesture may very well be part of language competence, playing a decisive role in language evolution and development (see infra). The dual cognitive and social function of gestures is the primary focus in gesture studies, with gestural phenomena being viewed as offering "a window into the mind" and playing a vital role in social interactions.

After providing a historical perspective and a brief overview of some fundamentals of gesture studies, this chapter will focus on functional and formal aspects found in gesture studies emphasizing their relationship with cognitive linguistics. The chapter will then discuss the need for research on gestural meaning-making, or "gesture phonology", and gesture categorization before highlighting future directions in the area of human computer interaction.

2. Historical Perspectives and the Emergence of Modern Gesture Studies

Only since the 20th century (particularly the second half) have gestures been studied with direct relation to language, as opposed to (more broadly) communication. Classical interest in gesture (Cicero, Quintilian) was focused on its relation to rhetoric and how it could be used in oratory (Kendon 2004). Later, in the 17th century, statesman and philosopher Francis Bacon endorsed more research into gestures, "the language of the eye". This was followed up by his contemporary, physician John Bulwer, who saw gestures as a universal language, relating gestures to early signed languages. In the 19th century, antiquarian Andrea de Jorio, the first ethnographer of the body and language, focused on gesture as part of everyday interaction and as a means to better understand a specific culture, in his case the Neapolitan. In the same century, physician and psychologist Wilhelm Wundt contributed what could be called the first semiotic categorization of gesture.

Despite some historical attention to gesture's relation to language, cognition, and culture, the 20th century showed a decline in gesture interest, partially because gesture was viewed as a 'natural' form of communication (i.e., not language proper) governed by 'low-level' cognitive processes, which were of less interest to linguists studying intentional, 'high-level' cognition.

Under the category of nonverbal communication, psychologists and psychiatrists saw gesture as part of those "techniques which are relatively unconscious and only imperfectly subject to voluntary control" (Bateson 1968: 615; see also Ekman 1969; Friesen 1969). Chomsky's work around the 1960s "had the consequence of changing the primary enterprise of linguistics away from describing languages towards that of describing the mental apparatus that enables language", and partly thanks to the so-called "cognitive turn" in psychology and linguistics which Chomsky's work contributed to, gesture studies were found to have a new relevance (Kendon 2004: 83).

In the meantime, however, a second strand of research was developing, dealing more with the anthropological than the psycholinguistic. The earliest research, which would inspire future gesture studies, was that of anthropologist David Efron, a student of Franz Boas. In his dissertation work (1941), Efron's research intended to challenge Nazi "scientific" racial theories that gestures are determined, not so much by language, but by biological descent, by comparing gestural styles of thousands of Jewish and Italian immigrants in New York.

Oxford anthropologist Adam Kendon's earlier research, decades later, picks up from where Efron's leaves off, inspiring a new generation of gesture scholarship thanks to an interdisciplinary collaboration with psycholinguist David McNeill. Kendon (2018) notes that McNeill's seminal paper, "So you think gestures are nonverbal" (1985), lays the foundation of much of today's gesture studies (despite McNeill's many references to previous gesture research, including Kendon's own). In this paper, McNeill argues that speech and gesture's tight relationship is indicative of a shared psycholinguistic "computation" during language production (and hence, gestures ought not to be treated as "nonverbal"), where language is produced in concert across the modalities of speech and gesture. Both Kendon and McNeill are widely regarded as the fathers of gesture studies.

Other catalysts for the heightened interest in gesture was an increased awareness of sign linguistics by linguists and psychologists, the growth of research in cognitive linguistics, and a revived devotion to language-origin studies, to which gesture would offer substantial insights. With the foundation of the journal *Gesture* in 2001 and the International Society for Gesture Studies (ISGS) in 2002, gesture researchers from various disciplines gained a forum, which helped in consolidating gesture studies today.

3. Gesture Studies: Topics and Research

Speakers and signers of all languages gesture as they engage in discursive interactions. As Sweetser (2007) notes, during language acquisition children naturally learn how to coordinate and integrate the gesture-speech complex of their specific linguistic system. This integration is so tight that people tend to produce disfluencies in their speech when they are forced not to produce gestures with their hands and as a result start gesturing with other parts of their body, such as their heads (Krauss et al. 2000; Alibali, Kita, & Young 2000). People gesture as they are talking on the phone despite their listeners not being able to see them, and congenitally blind people who have never seen people gesturing produce gestures as well. Gesturing thus appears to have both a productive function (for the speaker) and a communicative function (for the listener). This section touches upon the fundamentals of gesture's tight relation to speech and language, cognition, and social interactions, as described in gesture studies.

Gestures are performed in three-dimensional space, and they afford encoding in space imagistically abstract thought not encoded in speech, as well as representing spatial relations, shapes, and forms. For example, it may be more efficient when at a bakery to identify the desired pastry by pointing and gesturing its shape than to use words. Gesturing, moreover, allows people to communicate in environments where speech is prohibited or not accessible, as is the case for factory workers in noisy environments (Harrison 2015) or in silent contexts such as monasteries (Umiker-Sebeok & Sebeok 2011).

Gestures also are performed in time, and can be analyzed temporally as a series of distinct phases (e.g., Kita, van Gijn, & van der Hulst 1998). Typically, a gesture will begin with a *preparation* phase, in which the hand is moved away from a *rest* position; it will then enter an *expressive phase* (which can be either a meaningful movement—a *stroke*—or a meaningful static configuration—a *hold*) before there is a *retraction* to a rest position or another gesture phase. Aside from the expressive phase, all phases are optional.

Gestures are artifacts of human phenomenological conceptualization and are codependent on the speech-language with which they are affiliated. One fundamental of gesture studies is McNeill's (2000) description of gestures being temporally co-timed and semantically co-expressive with their co-speech affiliates. Gestures are synchronous with their affiliated speech 90% of the time, and they "anticipate the speech in their preparation phase, and synchronize with it in the stroke phase, which is timed to end at or before, but not after, the peak syllable" (McNeill 2000: 42). Gestures produced during stuttered speech are also "stuttered" and resume when vocal fluency has been recovered (Mayberry & Jaques 2000). Furthermore, the meaning expressed in the gesture is context-sensitive and semantically and pragmatically related to the co-speech. For example, the gesture stroke a speaker might produce while uttering *I bought a new vase* will be co-timed with the spoken word *vase* (and not on other words) and will provide integrating information not encoded in the speech track about the vase itself (e.g., height, width, shape).

McNeill (1992, 2006) provides a primary distinction of "gesture types" (especially manual ones), placing them along what he calls "Kendon's continuum". The continuum spans different degrees of conventionalization and different degrees of dependency on speech (see Figure 30.1).

At one extremity are *signed languages*, which are extremely conventionalized and have the same properties as spoken languages, which they end up substituting.

Emblems, or "quotable gestures", are gestures proper to a culture and which, while they may be shared or recognizable by other cultures, are not universally comprehensible. These gestures, like the thumbs up-"good" or the ring-"OK" gestures, are often produced without speech (but see Kendon 1995) and are highly conventionalized both in their meaning and in their form.

Pantomime is "a gesture or a sequence of gestures conveying a narrative line, with a story to tell, produced without speech" (McNeill 2014: 2). It can be performed with the whole body, intentionally including facial expressions and gaze, as well as complex interactions with the imaginary scene.

Speech-framed gestures are those gestures which take the place of a linguistic slot in the speech where the gesture represents, for example, an action (e.g., "And the two cars just went [two hands embodying cars and making a crashing motion]").

Gesticulations, more commonly referred to as co-speech gestures, are those more spontaneous body movements accompanying discourse which embody an ad hoc meaning related to the spoken utterance. They have become the prime focus of research in gesture studies to the point that they are often referred to as "gesture" *tout court* in the literature.

Scholars have argued for different categories of gesture, for example based on their function (referential vs. pragmatic, Kendon 2004; representational vs. discursive, McNeill 1992; Cienki 2013; see also Mittelberg & Evola 2014). Referential or representational gestures have been described as

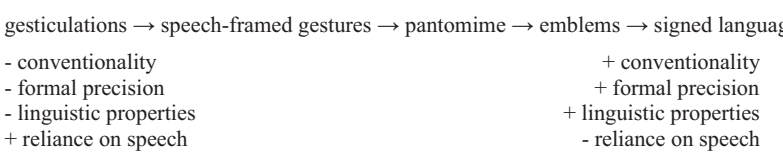


Figure 30.1 Kendon's continuum
Source: Following McNeill 2006.

iconics, in the case where a semiotic relationship of similarity is created between the form of the gesture and its referent (the "vase" example); *metaphorics*, where gestures have a metaphorical relationship with their referent (e.g., pointing up to tell someone to increase the volume); *deictics* or pointing gestures to spatially locate concrete objects or persons but also abstract ones (as when assigning discourse referents to different locations in the gesture space, e.g., saying "Ella was here and Farin over there" and pointing to two different locations in space to disambiguate anaphoras of the grammatical sentence) or pointing to objects or persons that used to be present in the physical space ("phantom pointing", e.g., pointing to the chair of someone who left the room while continuing to talk about him). Other gestures accompanying speech may have no representational function and only a discursive or pragmatic one, for example *beats* which are those gestures which serve to evidence discursive content and are highly co-timed with the affiliated speech (e.g., a repetitive up-down motion with the hand while saying "Thomas went on and on and on about photography"). Recent neural data suggests that different brain regions are activated depending on gesture types (e.g., Bernard, Millman, & Mittal 2015; Joue et al. 2018, 2020).

Another construct that is dealt with symbiotically by gestural and linguistic studies is metonymy, which is related to metaphorics. Gestures can be metonymic in relating to concrete objects (Bouvet 2001; Mittelberg 2006; Cienki 2007), like when pretending to hold a cup, where the object is to be imagined external to the hand. In contrast to this "external metonymy", an example for "internal metonymy" (Mittelberg & Waugh 2009) would be the index and middle finger moving alternately (pointing downwards) to stand for 'walking', where an immediately represented characteristic part of a referent stands for the whole referent (the person walking).

As Kendon (2000) argues, whether or not gesture should be definitively considered part of language or not depends on how we define language. However, it is hard to deny a tight relationship between how gestures are used during talk, in both spatiotemporal terms and in terms of the information content being communicated cross-modally. One potential key difference between "words" (and "signs" of signed languages) and "gestures" is that they serve different yet related functions in discourse: gestures proffer the specialized affordances of encoding spatiotemporal information more immediately than speech (as evidenced by the indexical use of pointing) and of contributing to the regulation of the discourse through beats and changes of posture.

It should be noted that, besides the types of gestures that are often described in gesture studies which express or refer to some sort of external representation (be it "in the world" or related to the discourse at hand), humans produce other body movements that may be interpreted as expressions of more interior states, or self-focused body movements (Evola & Skubisz 2019), which include "adaptors" (Ekman & Friesen 1969), such as fidgeting and other purely nonverbal and physiologically-based behaviors.

Because of the strong alliance between gesture and language, it follows that different linguistic systems include different gestural systems. Examples of gestures variability across linguistic and cultural systems will be described below.

4. Gesture Function: Cross-Linguistic and Cross-Cultural Research

The tight informational and communicative integration between speech and affiliated gestures lies not only at the level of using language while speaking-gesturing. With the understanding that cognition is from the perspective of the "extended mind" (Clark & Chalmers 1998), which puts the brain in relation to the body as well as the person's situated environment, language (which in our view includes gesture) influences and is motivated by the external world of speaker-gesturers and their representations of it. For cognitive linguists, language and gestures as produced by individuals are based on shared patterns of usage of cultural models of embodied cognition, where meaning is formed by and emerges from an encyclopedic knowledge as it is shared and used by individuals.

Research in gesture production has evidenced systematic variations of gesturing patterns across languages which encode information differently from a linguistically typological standpoint. One well-documented typology, stemming from Talmy's (1985) research, categorizes how different languages represent motion events. Motion events, or expressions of (literal or metaphorical) objects moving following a path and manner of motion, have different syntactic structures depending on the type of language encoding them, and this is represented both in speech and in gesture. English (together with other Germanic, Finno-Ugric, and Slavic languages) uses particles in the verb phrase to show path of motion and is thus classified as a satellite-framed language, whereas Romance languages (along with Semitic, Turkic languages, as well as Basque, Greek, Japanese, Korean, and also American, Netherlands and most other signed languages) are classified as verb-framed languages, where motion verbs typically encode path, leaving manner of motion to be expressed in a complementary way (Slobin 1997, 2004; Slobin & Hoiting 1994; Talmy 1985, 2000). For example, in English, an expression like *the ball rolled down the hill* encodes manner (*rolled*) and path (*down*) with a single clause and one co-speech gesture (e.g., creating a circular downward gesture), whereas Spanish would typically encode manner and path as two separate chunks of information (*the ball was rolling as it descended the hill*) and in two different co-timed gestures (a circular "rolling" gesture and a separate "downward" path gesture; see *inter alia* Kita & Özyürek 2003). The argument is that speakers of these two language types follow different patterns of thinking-for-speaking (Slobin 1996) about motion both in language and in gesture. Studies of second-language speakers, where their L1 and L2 differed typologically, have shown that even when speakers used the L2 verbal form correctly, they tended to use the gestures of their L1 (Stam 2006; Tellier 2008). The patterns that a language uses (especially an L1) to chunk information influences gestural representation, due to the tight cognitive integration between language and gesture.

Gesture research has contributed to discussions in linguistics regarding the systematic cross-linguistic variation of word order. The majority of language families (56.6%) commonly represent simple transitive events following a subject-object-verb (SOV) order, with 13% using subject-verb-object (SVO) order, and verb- or object-initial order being preferred in about 11% of language families (Hammarström 2016). In one study by Goldin-Meadow and colleagues (2008), speakers of different word-order type languages were asked to describe events nonverbally by miming the events using gestures without speech. The word order of the participants' respective language did not have an effect on their gestural representations, and participants consistently preferred the gestural analogue of SOV. In another study by Özçalışkan, Lucero, and Goldin-Meadow (2016), English- and Turkish-speakers were asked to describe motion events verbally (in their respective language) and nonverbally (using silent gestures). The two groups differed as expected in the verbal condition, however there was no language effect in the nonverbal (silent) condition, with both groups packaging path and manner in a conflated fashion and following the gestural analogue of SOV word order. This research contributes to the hypothesis of an SOV-order predominance in the early stages of spoken and signed languages, with variations being introduced historically (e.g., Futrell et al. 2015).

Cross-linguistic research of gesture has often dealt with more cultural aspects of linguistic communities, that is to say, with features dealing more with how the speaker-gesturers' communities are gesturally-linguistically representing shared conceptual constructs (as opposed to dealing with grammatical structures of different languages; see Cienki 2013, *inter alia*). Gestural deixis is one of many other conceptual-representational phenomena which exhibit high gestural variability both in form and reference across cultures.

Pointing, or spatially locating and communicatively indexing objects via gesture, is a universal exclusive to humans (Kita 2003), despite some animals being able to respond appropriately to pointing gestures produced by humans. It is considered perhaps the most primitive form of communication and a "precursor of language" both in phylogeny and ontogeny (Enfield, Kita, & De Ruiter

2007). Children start pointing just under one year of age (Butterworth & Morissette 1996; Cochet & Vauclair 2010), first with declarative pointing followed by imperative pointing (Camaioni et al. 2004), and the onset of pointing gestures developmentally is indicative of joint attention, crucial for theory of mind, as well as being critical to language development. Cross-cultural variation in gestural deixis, or pointing, has been reported by many scholars (see Kita 2003). Kendon and Versante (2003: 109) describe six contrastive variations of manual pointing in Neapolitan, for example where a pointing with palm down indicates distinguishing an object from a collection, foregrounding it as the topic of discourse, versus a pointing gesture with palm to the side as an object of referent which is not the focus of discourse. The authors conclude that "the form of pointing adopted by a speaker is systematically related to the way the object being referred to is presented in the speaker's discourse". Wilkins (2003) argues that pointing with an extended index finger may not be cross-culturally the canonical way of pointing, with pointing being performed often in less obvious ways such as via head-tossing, lip-pointing (Enfield 2001), and nose-pointing (Cooperrider & Núñez 2012). Cross-cultural variability in deictic systems has also been noted with reference to time (see Núñez & Sweetser 2006 for a discussion of the Aymara's gestural deictic system with reference to temporal events), frames of references (Levinson 1996), and epistemic stance in religious discourse (Evola 2010).

5. Gesture Form: "Phonological" Differences with Spoken Language

Up to now, this chapter laid out the symbiosis between the fields of gesture studies and cognitive linguistics. They both concern communication modalities, and they can both be used as a window onto important aspects of human existence, be they inner structures (cognition) or outer ones (culture and social practices). Furthermore, modern gesture studies emerged and developed somewhat dependent on theoretical advances in linguistics. As mentioned in the introduction, we will also look at gesture in its own right and compare its structure to approaches and insights in cognitive linguistics. Underestimating the importance of analyzing the structure of a phenomenon itself is a problem of behavioral studies in general: "interaction practices have been used to illuminate other things, but themselves are treated as though they did not need to be defined or were not worth defining" (Goffman 1971: xi). For a young, interdisciplinary field like gesture studies, there is an even stronger temptation to use the methods and analyses of neighboring disciplines rather than to define structural elements of gesture in its own right.

It is true that important strategies of meaning-making occur equally in gesture and in language, including iconicity, metaphorical and metonymical mappings, and indexical structures. Further, gesture studies can profit from linguistics with its disproportionately greater range of knowledge accumulated over the centuries. Yet, all of this may also lead to an undue linguistic bias or create the impression that language and gesture should be equal or at least very similar in structure. Linguistic theory, or theory derived from linguistics, could be assumed to account for all meaning-making in gesture. Misconceptions of that kind are quite natural given the influence of linguistics, especially the area most closely related to gesture: cognitive linguistics.

Gesture and language are two formally different modalities. They differ almost non-overlappingly in how they are produced and perceived. Speech is produced orally by manipulating mostly less visible parts of the body from the diaphragm to the tongue, transmitted acoustically, and perceived aurally. Gesture is produced by visibly evident body parts, transmitted electromagnetically (by light), and perceived visually. This means that the very basis of meaning—performing a specialized action that is expressive and communicative—differs vastly for gesture and speech. The process of producing meaning-distinguishing units (in speech: phonology) and meaningful units (in speech: morphology) cannot be the same because the physical manifestations of speaking and gesturing are so diverse, affording different kinds of information. To assess this difference is a challenge in current

gesture studies since the knowledge is very one-sided, with very little work on what could be called "gesture phonology" or "gesture morphology".[1] To date, it is still unclear how exactly humans make the semiotic leap from perceiving gestural motion to interpreting gesture form and function.

It is a basic insight that language is rather digital and analytical in nature and gesture rather analog and synthetic; also in their temporal unfolding, language and gesture are "different in every way" (McNeill 1992: 19). Fittingly, basic structures of meaning-making are different. In gesture, there is no syntax like in language, no grammar, no words, no prefixes or suffixes, no nouns and no verbs (but see research on young sign languages in Haviland 2013; Abner et al. 2019). Gesture uses different expressive resources and conveys different kinds of information, by different strategies. If there are no verbs and nouns in gesture, what are the categories that gestures come in?

As was described above, McNeill (1992) most popularly distinguished gestures into iconics, metaphorics, beats, cohesives, and deictics. While McNeill (2005) himself clarifies that these categories are not exclusive, they are still widely used categorically in empirical investigations (which is problematic). There are vague overlaps in gesture categorizations, for example in those by Wundt (1904) or Ekman and Friesen (1969) or more recent proposals by Müller (1998, 2014), Poggi (2008), Streeck (2008), and Talmy (2018). Categories often encompass deictic gestures, conventionalized gestures or emblems, and different kinds of representational gestures (also called depicting or referential gestures). Despite the clear opposition between specific communicative actions, no one classification is widely used and accepted as standard. Some categorizations also do not serve as a comparable coding scheme for empirical data, which requires "mutually exclusive and exhaustive codes. This means that only one code can be associated with a particular event (mutually exclusive) but that there is some code for every event (exhaustive)" (Bakeman & Gottmann 1997: 26). Exceptions are Hassemer and McCleary (2018, see below), and the "NEUROGES" coding system for psychological states associated with body motion (Lausberg & Sloetjes 2009). These problems in gesture categorization raise the suspicion that we lack a novel perspective on meaning-making in gesture. The remainder of this section will be used to highlight what the confines of this collaboration are. We will argue for the existence and relevance of gesture phonology and touch upon what basic tenets may look like.

There are many insights into what gestural meaning-making on a phonological level is. Consider for example Mandel's seminal article "Iconic devices in American Sign Language" (1977), which lays out numerous design features of meaning creation in a visual modality. Mandel astutely describes a range of iconic strategies that systematically use handshape and motion to draw attention to locations, areas, and volumes of space. He can do so because he clearly separates conventionality, the semiotic mapping strategy that does not require any resemblance of the gestural action to the referent, from iconicity, the strategy that particularly exploits all the potential of visual configuration and movement to be expressive. Excluding conventionality from the analysis lays bare what iconicity is and exposes its modality dependence. It also shows that a category of 'iconics' is much too coarse for a phonology of gesture, which, unlike language, uses diverse iconic strategies as the central source for meaning.

We will walk through the process of conveying meaning in a single, everyday gesture in order to sample the diversity of iconic strategies. When someone wants to highlight something she says, or present a conclusion, she may present her loosely cupped hands with the palms facing upwards: a palm-up open-hands gesture. We can ask how this rather lax motion of specific body parts can afford communication. While the gesturer may be walking, turning her head to look at different people, the observer has to recognize particularly the hands—being moved forward and then held—as a gesture, and not any other body part's action. Langacker (2008) describes the communicative notion of bringing one part of a concept to the foreground as "profiling". If the observer did not perform such a profiling operation, the meaning of this gesture would not be attainable and communication would not be possible—neither would it be if he left out any of the preceding operations—because 'a hand held palm up' is not the meaning of this gesture, and the profiled shape of the articulator needs to be interpreted further.

When humans interact with objects, they establish contact with them, for example pushing something, squeezing it, or securing something between body parts. The gesturer's palm-up open-hands gesture exploits our pre-existing knowledge of the interplay of physical entities. The observer of our example gesture thus does not just see cupped hands, but identifies specifically the surfaces of the palms as meaningful, since they demarcate the area that makes contact with the imaginary object that is part of this gesture. So on top of the hand as meaningful articulator, the surface of the palm is profiled. The next two processes can also be described as central cognitive-linguistic mapping processes. Mittelberg and Waugh (2009) describe their comfortable coexistence, as well as their order, in an article entitled "Metonymy first, metaphor second". "External" metonymy is the process of recognizing the shape and location of an imaginary object by being adjacent to the palms' surfaces (Mittelberg & Waugh 2009: 340). Only when the observer has taken this step can the metaphor of HOLDING AN IMAGINARY OBJECT IS PRESENTING AN IDEA be applied. The phonological analysis of gesture from the articulation to its meaning (as done in this example), is called *gesture-form analysis* (Hassemer & McCleary 2018; Hassemer 2016).

While successfully using cognitive linguistic analogies, the example shows the analysis of meaning-making in gestures to be very different from linguistics. In gesture, meaning rests on a series of spatial (i.e., geometrical) operations that define all following forms. Metonymic and metaphorical mappings also have a very *spatial* realization in gesture. When we contrast this with linguistic metaphors, even those that draw on spatial-motoric source domains, such as "I lay down my life for the sheep" (John 10:15; King James Version), we see that the linguistic metaphor is much less 'spatially specific'. The spatial nature of the gesture modality, in contrast, was ubiquitous throughout the above analysis, especially when close to the articulatory base (Figure 30.2). Note that the gesture example above was chosen specifically because it accommodates cognitive linguistic theory. Other, more speech-independent gestures like pointing or indicating size, shape, or path show even more geometrical, speech-independent structure (Hassemer & McCleary 2018). Besides the apparent spatial nature of gestures, experimental work suggests that people (with low verbal fluency) who are proficient at spatial visualization use the gesture modality more frequently (Hostetter & Alibali 2007).

In this section, we briefly introduced basic questions of gestural phonology, and the challenges the young field poses with regard to basic categories that would allow for comparative empirical analyses. While gesture was shown to contribute to cognitive linguistics and be receptive to cognitive linguistic theory for high-level mappings like metaphor and metonymy, there is a research gap on the phonological, or formal, level and in describing the heterogeneity of iconicity. A demand for research systematizing the functioning of bodily communication comes also from industry,

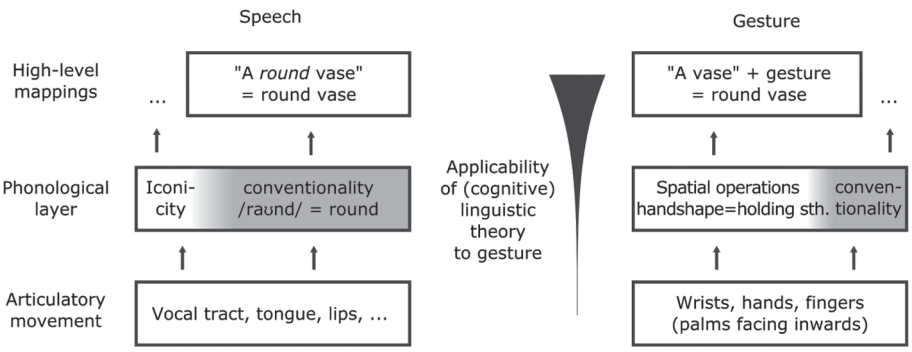


Figure 30.2 Low-level (bottom two rows) and high-level (top row) analysis of speaking or gesturing about a *round* vase, with regard to the applicability of cognitive linguistic theory. Note the spatial operations specifying iconicity occupying a greater area within the phonological layer of gesture.

which could profit from capturing the geometrical (i.e., algorithmically describable) models of the different strategies of meaning-making in gesture.

6. Future Directions: Language and Gesture in Human-Computer Interaction (HCI)

Besides the need for a gesture phonology, there are other areas in gesture studies and cognitive linguistics attracting future research, like the relationship between gesture and speech in language evolution (e.g., Fay et al. 2014), gestures in child development (e.g., Goldin-Meadow & Alibali 2013), and the relationship between gestures and signs in signed languages (e.g., Goldin-Meadow & Brentari 2017). In light of the limited scope of this chapter, we will focus on one area of particularly high potential for gesture research from a cognitive linguistic perspective: human-computer interaction.

Already in 1980, Richard Bolt (1980: 262) claimed that, in his pioneering speech-gesture machine, "voice and gesture inputs … converge to provide a concerted, natural user modality"—a phrase akin to how a user experience designer may introduce a cutting-edge multimodal interface today. Nevertheless, 40 years later the otherwise booming field of HCI is still a niche interest area within the fields of cognitive linguistics and gesture, and research on cognitive linguistics and gesture in HCI outlets is even more rare. The divide between HCI and the phenomena discussed in this volume is too large, and HCI's interest in gesture studies approaches too vague, to lay the blame on a general skepticism of HCI towards more qualitative research. For the immense advances in speech recognition and considerable evolutions in gesture recognition, approaches from cognitive linguistics and gesture were not frequently consulted; as in the words of the speech recognition pioneer Fred Jelinek: "Anytime a linguist leaves the group the recognition rate goes up" (cited in Jurafsky & Martin 2009). Despite these sobering assessments, this section will offer an optimistic perspective on prospective inputs from gesture studies for HCI by showing how the technology behind current HCI systems relies on categorization systems of human communication. We will further touch upon how gestural HCI may benefit from intuitive gesture repertoires and theoretically grounded multimodal interaction concepts, and how HCI may enter the relationship between cognitive linguistics and gesture studies through providing a testbed for these concepts and providing further insights.

The technological capabilities of both speech and gesture recognition systems are unthinkable without the algorithms and statistical models called machine learning (specifically deep learning/deep neural networks), which is often linked to the distant goal of creating "artificial intelligence". The form of machine learning most widely used in today's software is 'supervised' learning, in which the system's training data, for example videos of people performing gestures, is labeled. This means that clear gesture categories are a necessary condition for machine learning, thus relying on work on gesture structure on gesture taxonomies (Hassemer & McCleary 2018).

The software used in speech recognition is fueled by machine learning technology, too, but the hardware has always been a simple microphone (as the input is ordinary speaking). In contrast, gesture recognition hardware systems of the past decade underwent the invention of altogether different sensory apparatuses (and the question of which gestures perform best for a given system is entirely open). There is a large group of optical motion capture systems, used also in gesture studies (Hassemer 2016, including open-access motion-capture data; Baytaş, Yantaç, & Fjeld 2017), but also inertial, mechanical, and magnetic systems (Troje 2002; Brodie, Walmsley, & Page 2008). Yet, many of these forms of motion capturing—for character animation in films, for medical diagnostics, and also for scientific investigation—are very expensive for widespread use in gesture research.

Gesture recognition became mass-marketable in 2010. Microsoft's infrared system Kinect opened up full-body gesture tracking to a large audience, including scientific studies (Rümelin, Marouane, & Butz 2013; Tscharn et al. 2017; Trujillo et al. 2018). In 2012, the matchbox-sized

infrared controller Leap Motion appeared. The device can be either placed on the table top or attached to the front of a virtual reality headset to track hand motion. These and other infrared solutions enabled gesture controls in cars, drones, PCs, mobile devices, gaming, as well as virtual and augmented reality. Infrared systems are comparatively cheap and allow light-agnostic capture. Despite the tendency of using gesture controls in products applications, they have yet to become an indispensable part of any product. Besides performance issues, this may be due to poor designs and limited knowledge about gesture.

Moreover, different sensor strategies not yet part of a mainstream product are beginning to enter the market. One strategy goes back to simple video data of the form that can be recorded by any regular camera. This recognition strategy, followed for example by Güler, Neverova, and Kokkinos (2018, including open-access code and movement tracked data), relies solely on software, including machine learning algorithms specialized in moving images—in contrast to static pictures as used for example in the large field of facial recognition. Further, a new hardware *and* software system called Soli was announced in 2015 by a research group at Google led by Poupyrev (Lien et al. 2016). Soli is a small radar chip, which captures small finger gestures that imitate miniature actions such as index finger and thumb touching (e.g., imitating pressing a button) or sliding them carefully along one another (imitating turning the dial of an analog wrist watch). These micro-gestures are very discreet, and radar can also track gesturing in one's pocket. HCI concepts for such a system use manipulatory micro-actions seldom found in natural gesturing as gesture commands and thus bridge the gap between communicative action and instrumental action (Cadoz 1994).

The sensor systems across infrared, video, and radar and across different capturing volumes and distances require qualitative and quantitative research on a broad spectrum of gestures, including gestures performed by different parts of the body and micro-gestures. Gesture studies can further contribute to defining gesture repertoires, optimizing the user experience, but also improving technical development in the form of better machine learning results. Supervised machine learning is a tool that automatically finds subtle differences across given categories of data. Given that across gesture types meaning-creation is systematically different even in gestures that look very similar (Hassemer & Winter 2016, 2018), gesture studies can help to find those gesture types that are maximally different, for machine learning to exploit these differences for better prediction accuracy.

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Note

1 In this chapter, we use the terms *phonology* and *phoneme* for gestural meaning-making. The term "phonology" is inappropriate for gesture, since it deals with how sound creates meaning. Attempts to create an appropriate term for visual modalities, like Butterworth's (1970) "kinesics" and "kines", which fittingly relates to any *movement* and thus encompasses multiple articulators, have failed. The terms from sign linguistics "cherology" and "chereme" from Ancient Greek "hand" (Stokoe 1960) also were not able to catch on.

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Related Topics

embodiment; multimodality; culture in language and cognition; signed languages and cognitive linguistics

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31

COGNITIVE LINGUISTICS AND TRANSLATION STUDIES

Kairong Xiao

1. Introduction and Definitions

1.1 Linguistics and Translation Studies

Translation studies is understood to be closely connected with linguistics since, just as Baker (2000) claims, any discussion of translation inevitably draws on some set of assumptions concerning the way language is structured, manipulated, or used for certain purposes or cultural values. Linguistics, as the academic study of languages, not only inspires all forms of linguistic activities (including translation and interpreting) with its theoretical and empirical findings, but also takes translation as a trial of the applicability of its theories. It is in this sense that Baker (2005) summarizes two patterns of relationship between linguistics and translation studies, namely the linguists' interest in seeing translation as a perfect source of contrastive examples, and trying out their favorite linguistic theories on translation on the one hand, and the translation scholars' concern with finding theoretical concepts, frameworks, or analytic tools applicable to translation research on the other. These two patterns of interest in the connection between linguistics and translation studies have characterized almost the whole history of modern linguistics and translation studies, with ups and downs, featuring a love-hate relationship (Fawcett 1997; Rojo & Ibarretxe-Antuñano 2013).

In the history of translation studies, linguistics has played a crucial role, mostly as a source of inspiration for translation scholars' theoretical modeling and data analysis, characterized by several generations or brands of linguistic approaches to translation, such as structuralist (Nida 1964; Vinay & Darbelnet 1958/1995), systemic-functional (Catford 1965), and relevance theoretical views (Gutt 1991) of translation. Over the years, translation studies has gone through different stages of development, with differing roles of linguistics, from the analysis of language units below sentences to textual analysis, from prescriptive to descriptive studies, from the focus on language operation or translation shifts to the focus on functions, communicative effects, and ideological issues of discourse (Nida 1964; Delisle 1980; House 1997; Wilss 1982; Hatim & Mason 1990; Baker 1992; Neubert & Shreve 1992, etc.).

From the beginning, especially when modern translation studies began in the 1940s and the 1950s, translation scholars started to look to linguistics for theories or concepts that could be applied to the modeling of translation in the justification that since language is the raw material of translation it is reasonable that linguistics has something to offer for translation. Therefore, translation studies began as a branch of linguistics or comparative linguistics (e.g., Holmes 1972/2000) and has

gained great momentum of development with inspiration from the linguistic theories of meaning, structures, functions, contexts, etc., and has developed abundant concepts, thoughts, ideas, and theories. The following are some of the core concepts and ideas assumed by the earlier linguistic approach to translation.

1.1.1 Translation as Equivalence

Translation consists in achieving a certain degree or form of equivalence or the equivalent effect between source text (ST) and target text (TT) so that the TT could be considered as a translation of the ST in the first place. Scholars thus attempted analysis of certain levels of language structures to find types of equivalence in translation (Nida & Taber 1969; Toury 1980; Pym 1992, 1995; Baker 1992).

1.1.2 Translation as a Linguistic Operation

Catford is a strong upholder of the idea that "translation is an operation performed on languages" (Catford 1965: 1). According to him, translation is a process of substituting textual materials. For many linguistic scholars, a translation theory should draw on a certain linguistic theory to develop translation strategies based on the structural analysis of the source language or contrastive analysis of the two languages concerned, such as the componential analysis by Nida (1975) or the translation shift theory by Catford (1965).

1.1.3 Meaning as an Entity

At least until the 1990s, an objectivist and static notion of meaning had been held by many scholars in the field of translation studies, which postulates that meaning is something that is contained in the language, and exists outside the language user's mind, and is something that could be apprehended, deverbalized, and transferred intact into another language. One example is the Interpretive Theory of Translation by Seleskovitch and Lederer (1984). Similar views are held by Oettinger (1960: 104), who suggests that "keeping significance invariant is the central problem in translating between natural languages", and Ross (1981: 8), who believes that "a translation ought to have the same meaning as the original".

1.1.4 Translation or Translator as Subordinate to Source Text or Source Text Author

For most of the linguistic tradition of translation studies in the 20th century, translation has been assigned a subordinate status, whose quality is judged by the degree of its faithfulness or similarity to the source text. The translator is often conceptualized through metaphors as a servant or at least in a less active role in meaning-making.

The above ideas starting from linguistics towards translation have time and again met criticisms, thus putting linguistics and translation studies in a troubled relationship (Fawcett 1997: 1). For one thing, a linguistic approach to translation has been criticized for its narrow view of what translation is and for deriving rules of translating from separate language units (Snell-Hornby 1988/1995: 3). For another, linguistic analysis is also criticized for being focused too much on linguistic forms, irrespective of the contextual, cultural, and cognitive constraints (Malmkjær 2018). More criticism was made, especially in the 1980s through the 1990s, by scholars outside the linguistic framework who began to see translation as cultural and political manipulation. The criticisms of the linguistic approach to translation studies that center around issues such as being too narrow in the analysis unit, too focused on linguistic forms, static notion of meaning, and the (improper) view of the less

active role of the translator in meaning-making would find their best remedies in cognitive linguistics, an interdisciplinary branch of linguistics developed within the past 30 years or so.

1.2 Cognitive Linguistics and Translation Studies

Cognitive Linguistics, with its focus on the relationship between language and mind, has developed a set of theoretical tools that might be applied not only to monolingual data but also to bilingual or multilingual practice such as translation. The basic assumptions held by cognitive linguists, such as cognitive commitment, embodied cognition thesis, encyclopedic view of meaning, meaning as conceptualization, claim of discourse as a usage event, assumption of lexis and grammar as a symbolic unit, among others, provide a valid foundation for the theoretical construction needed in Cognitive Translation Studies (the need as specified by Shreve & Angelone 2010; Halverson 2010; Muñoz 2017; etc.). As it happens, some of the theoretical tools have found effective applications in the cognitive approach to translation studies, such as conceptual metaphor and metonymy (Tabakowska 1993; Mandelbit 1996; Tirkkonen-Condit 2002), categorization and protype semantics (Halverson 1999a, 2002), frame semantics (Vanneren & Snell-Hornby 1986; Vermeer & Witte 1990; Rojo 2002b; Boas 2013; Xiao & Wen 2013; Xiao 2017), construal and cognitive grammar (Tabakowska 1993; Halverson 2013). Some other theories that might prove potentially applicable include theories of image schema, mental spaces, conceptual blending, iconicity, and textual and discursive cognition, most of which have been touched upon in Rojo and Ibarretxe-Antuñano (2013) and Wen and Xiao (2019).

2. Historical Perspectives

Starting in the 1990s and well into the first two decades of the 21st century, a marked transition in translation studies is seen in the shift from the non-humanized model to human-centeredness or human-factor focus (the two phrases used by Tabakowska (1993) and Halverson (2013)). Abundant works (such as papers, monographs, collections, handbooks, and proceedings) have been devoted to the application of Cognitive Linguistic frameworks to the cognitive aspect of translation. This section reviews some of the earlier attempts (in the 1990s and early 2000s) for a historical perspective, and more up-to-date research is introduced in section 3 (Critical Issues and Topics) and section 4 (Current Contributions and Research).

2.1 Relevance and Translation

Relevance Theory put forward by Sperber and Wilson (1986/1995) is not a Cognitive Linguistic theory in the full sense, but it could be regarded as a study of language and verbal communication in the scope of first-generation cognitive science. Sperber and Wilson (1986/1995) believe that human verbal communication is "an ostensive-inferential communication", which follows a cognitive principle of relevance by which human cognition tends to be geared to the maximization of relevance, a communicative principle which means every utterance conveys a presumption of its own optimal relevance. They also believe that human cognition is either descriptive by establishing resemblance between external world and mental representations, or interpretive because it is a resemblance between two mental representations. Gutt (1991) applied Relevance Theory to translation studies by suggesting that translation is a case of optimal interpretive resemblance so that "two utterances or two ostensive stimuli interpretively resemble each other to the extent that they share explicatures and/or implicatures (Gutt 1991: 44). However, it is the task of the translator to judge how relevant all aspects of the ST contents are and to transfer ostensively all those relevant aspects to the target readers. Gutt's attempt to describe translation in terms of a general theory of communication and to explore the mental faculties of the translator has had far-reaching significance

and attracted both follow-ups and critical discussions, such as Tirrkonen-Condit (1992), Malmkjær (1992), and Thomas (1994).

2.2 Cognitive Linguistics and Poetics of Translation

Tabakowska (1993) is probably one of the earliest to take a cognitive stylistic approach to translation by attempting a cognitive reinterpretation of equivalence based on Langacker's view of grammar as imagery (Langacker 1987) and Jakobson's "equivalence in difference" (Jakobson 1959). She claims that Langacker's cognitive grammar theory sees grammar as imagery and offers translation studies a theoretical framework for the "humanized" analysis which was lacking in previous Chomskyan linguistics (Tabakowska 1993: 4). Therefore, by adopting Cognitive Linguistics as the theoretical basis, she demonstrates a cognitive poetic analysis of translation with a focus on the "human factor" in cases of translating imagery (Tabakowska 1993: 78–100). Tabakowska not only is one of the earliest scholars to explore the application of Cognitive Linguistics as an approach to translation studies, but also made a strong call for the study of the human factor, conceptualization, and construal operations in translation research, which would later become the core concepts and basis of the Cognitive Linguistic framework of translation.

2.3 Conceptual Metaphor and Translation

Conceptual Metaphor Theory proposed by Lakoff and Johnson (1980) is one of the most productive theoretical tools, with widespread applications to translation studies based on the fundamental view of seeing metaphor as a way of thinking rather than a special linguistic device. Conceptual mapping between domains could be traced for construal operations in translation so as to solve the problem of "translatability" of metaphors, with differing theoretical analysis by different scholars, for example, imagery equivalence by Tabakowska (1993), and domain conflict by Tirkkonen-Condit (2002). Metaphor has also been used to conceptualize the relationship between ST and TT in the sense that translation is a mapping between ST as one domain and TT as the other. It is in this sense that D'Hulst (1992) suggests that conceptual metaphor is helpful in building translatological models (Muñoz 2013: 81).

2.4 Frame Semantics and Translation

Frame Semantics developed by Fillmore (1968, 1977, 1985) relates language to experience and describes meaning as the conceptual representation in the mind of the speaker. As an earlier version, scenes-and-frames semantics had been applied by some German scholars in different interpretations of translation studies. Vannerem and Snell-Hornby (1986) suggest that frames are linguistic forms to evoke the scenes behind the text so that the text will be comprehended capturing the scenes related to the frames in it. Vermeer and Witte's (1990) interpretation of frames is closer to the deverbalization model by Seleskovitch (1968) in the sense that frame as the codification of a scene will be transferred intact or transformed through channel operations. Kussmaul (2005, 2007) studied the role of mental images (such as visualization) in the translator's meaning construction and production of coherence. Rojo (2002a, 2002b) established a frame analysis model by taking the social context into account for the processing of cultural differences through the case of humor translation. Xiao (2017) proposed a frame-operation model as a type of re-conceptualization in translation for an account of the knowledge management in literary translation. Frame Semantics has found more vitality in its application to computational lexicography to build up bilingual or multilingual FramNets to be used as tools for human and machine translation, as has been investigated by Boas (2005, 2009, 2013).

2.5 Some Other Attempts

In addition to the aforementioned prominent fields, scholars have also focused on specific concepts or theories of Cognitive Linguistics for the discussion of translation or translating process. The notion of "prototype" or "prototypical effect" has been applied to the definition of "translation" and alternative translations for the same source text (Snell-Hornby 1998/1995, Halverson 1999a, 1999b, 2002). Some theories of Cognitive Linguistics have been combined with concepts or theories of bilingualism or multilingualism for the discussion of bilingual conceptual representation and its implications for translation (for example Pavlenko 2009; Ruiz et al. 2008, Halverson 2013). More recent attempts have been made at applying Cognitive Linguistic theories to the interpretation of the features of translational language (namely the translation universals) derived from corpus methods. For example, the "Gravitational Pull Hypothesis" proposed by Halverson (2003, 2010) suggests that features of translational language like normalization or conventionalization (Baker 1993) might be the result of the cognitive salience of high-level schemas and/or prototypes within schematic networks, which is termed as "gravitational pull". That is to say, linguistic forms associated with highly salient cognitive structures are more likely to be overrepresented (Halverson 2003: 218). Some other researchers apply Cognitive Linguistic theories to redefine traditional translation concepts such as equivalence (Tabakowska 1993; Halverson 2013; Rojo & Ibarretxe-Antuñano 2013) and translation shifts (Chesterman 2000; Halverson 2007), etc.

3. Critical Issues and Topics

3.1 Key Tenets and Principles of Cognitive Linguistics

Cognitive Linguistics, as a modern school of linguistic thought, an intellectual movement (Langacker 1991), and an enterprise (Evans, Bergen, & Zinken 2007), has been rapidly thriving in different directions and various fields since its emergence in the 1970s out of the research of a number of scholars who turned their attention from formal approaches to language to the relation of language and mind. Cognitive Linguistics is more often seen as a research approach with a common set of commitments and principles that have subsumed a diverse range of theories about language. Since its major concern is the investigation of "the relationship between human language, mind and socio-physical experience" (Evans, Bergen, & Zinken 2007: 2), Cognitive Linguistics has afforded translation studies some potential inspirations on the conceptual basis of language, comprehension of the source text, and meaning-making in the target text, etc. The following section introduces some of the core tenets of Cognitive Linguistics in relation to translation and their implications for translation studies (for a more detailed overview of Cognitive Linguistics please refer to Evans & Green 2006; Geeraerts & Cuyckens 2007, etc.).

3.1.1 The Two Commitments of Cognitive Linguistics

Cognitive Linguistics comprises two main branches: cognitive semantics and cognitive approaches to grammar, underlying which are two key commitments and several different guiding principles. The two key commitments are "Generalization Commitment" and "Cognitive Commitment" (Lakoff 1990; Evans & Green 2006). The "Generalization Commitment" refers to the description of the characterization of the general principles that are applied to all aspects of language, with the implication of rejecting the formalist "module" or "subsystem" view of language and acknowledging that various aspects of language (phonology, semantics, syntax) share fundamental organizational features based on human cognitive abilities. This commitment ensures a common set of principles (such as categorization, prototype effect, metaphor, metonymy, etc.) to be applied in the study of all language phenomena and a holistic as well as a vertical approach to the study of

language (Evans, Bergen, & Zinken 2007: 4). For translation studies, this is of fundamental significance, as the generalization approach to language analysis may serve as a good remedy for the linguistic approach to translation studies that had been criticized for being too narrow in its analysis unit by the cultural approach, especially of the 1990s.

The "Cognitive Commitment" assumes that language is a part and a reflection of general human cognition. That is to say, there is no cognition specific to language or any independent module uniquely responsible for language processing. This means that all models of language should be established in accordance with what is known about human cognitive systems. A logical consequence of this commitment is that all linguistic activities are cognitive by nature and influenced by cognitive constraints. This has some significant implications for translation studies in the sense that translation, as a most complex cognitive activity (Hurtado Albir, & Alves 2009: 54), could and should be studied from the conceptions and theoretical frameworks of cognitive science, including Cognitive Linguistics.

3.1.2 The Guiding Principles of Cognitive Linguistics

The two commitments are the two pillars underpinning the "mansion" of Cognitive Linguistics, with specific guiding principles and tenets that might be used as analytic tools for language studies and translation research. The first group of principles is about the conceptual structure and its role in meaning construction (conceptualization), including the embodied cognition thesis, the encyclopedic view of meaning, and the assumption of meaning as conceptualization, among others. Specifically, the embodied cognition thesis states that the conceptual structure is embodied so that the linguistic meaning could not be studied without the consideration of human bodily experience. The encyclopedic view of meaning entails the idea that semantic structure is conceptual and meaning representation is encyclopedic. Different from the so-called "objectivist semantics", cognitive semanticists maintain that linguistic meanings are associated with the concepts in the speaker's mind rather than the entities in the external world. It is related to the postulate that lexical meanings do not just consist in the dictionary definitions but are dynamic in nature and emergent with the lexical concepts as "points of access" to the repositories of relevant knowledge (Langacker 1987). The conceptualization assumption of meaning holds that meaning is not contained in language, and that language functions only as a prompt for the construction of meaning. Therefore, meaning is constructed conceptually and conceptualization is understood as meaning construction.

Based on the general guiding principles, there are some specific theoretical views that are of great relevance to translation studies, including the views summarized by Evans, Bergen, and Zinken (2007: 13):

(i) There is no principled distinction between semantics and pragmatics.
(ii) Encyclopedic knowledge is structured.
(iii) Encyclopedic meaning emerges in context.
(iv) Lexical items are points of access to encyclopedia knowledge.
(v) Encyclopedic knowledge is dynamic.

In the cognitive approaches to grammar, there are also several important guiding principles, including the symbolic thesis and the usage-based thesis. The symbolic thesis assumes that the grammatical structure is symbolic in nature and its basic unit is a symbolic unit of form-meaning pairing. The usage-based thesis holds that the speaker's knowledge of language (and hence the meaning and properties of language) is derived from the situated use of language. This leads to the refusal of the distinction between knowledge of language and use of language, semantic meaning and pragmatic meaning, competence and performance, etc.

3.2 Implications of Cognitive Linguistics for Translation Studies

The above-mentioned tenets and principles held by cognitive linguists not only have far-reaching significance for the study of language, but more importantly have contributed to the emergence of some innovative ideas on translation, which serve as some core conceptions in the emerging field of Cognitive Translation Studies (Halverson 2010, 2013, 2017). Some of the innovative views and their implications are summarized below.

3.2.1 Start of Cognitive Approaches to Translation

The emergence of cognitive approaches to translation studies has been the most remarkable development of research in translation studies. The cognitive approaches to translation have come into being as a result of two scientific and practical trends. The first trend is the rapid development of cognitive science, people's growing interest in the miracle of mental activities, and the increasing need of artificial intelligence. The second is the advancement of research facilities (including hardware and software technologies), which have offered us more possibilities of researching into cognition (Wen & Xiao 2012), including cognition in language and translation.

The emergence of Cognitive Translation Studies implies some significant transitions and changes in translation studies, or at least the development of a new subfield as a complement to the existing fields in translation studies. First, there is the emergence of the cognitive paradigm in translation studies, including the use of cognitive theories (models, concepts, tools, or frameworks from cognitive science) and methodologies (such as those from the fields of psychology or neuroscience). Second, in translation studies, there is an increasing focus on cognitive aspects of translation, translating, or translator behavior, for example the conceptual basis of language, the conceptualization approach to meaning, the mental or physical process of translation, translator competence and its acquisition, translation as a social phenomenon, etc. Before the emergence of Cognitive Translation Studies, product and function-oriented research was dominant, with rapid expansion in corpus-based research since the 1990s. For most of the 20th century, process-oriented research was the least developed of the three Descriptive Translation Studies branches depicted by James Holmes (1972/2000). Since the 1990s and especially the 2000s, explosive research has been seen on translation process and translator behavior. Third, the translator is now the focus. As Tabakowska (1993) and Halverson (2013) put it, in most of the 20th-century translation studies, both literary and linguistic approaches to translation focused on "texts" and "systems" instead of human beings and their actions (as also suggested by Pym 2010: 84). In the cognitive paradigm of translation studies, there is a shared call for more focus on the role of the translator and translator agency (Halverson 2013: 35), or a more "humanized" translation studies (Tabakowska 1993: 5). In this sense, a Cognitive Linguistic approach is needed because the cognitive view sees language action (including cross-linguistic activities such as translation) as dynamic conceptualization where the language user (the translator as the crucial user in the case of translation) plays the key role of a conceptualizer through cognitive construal operations. In other words, a Cognitive Linguistic view of translation requires that observation should be made on the participants and their agency in translation.

3.2.2 Translation as Cognition and (Re)conceptualization

Translation is a bilingual or multilingual activity that is assumed to involve operations on language (Catford 1965). However, the traditional concepts of equivalence, translation shifts, ST-TT correspondence, are less valid in the Cognitive Linguistic account of translation because in the cognitive paradigm translation is not a static transfer from one language to the other, but rather a dynamic construal of meaning-generating act where the source text serves just as the device for

prompting the knowledge needed for meaning generation. That is to say, meaning is not contained in the source text, but generated in the translator's mind while translating through the activation of relevant knowledge, and construed to form the meaning potential to be generated by the target readers in their reading of the target text. Therefore, there is no sameness or contrastive relationship between ST and TT. They are but linked conceptually to be meaning generation potentials. It is in this sense that Halverson (2013: 37–48) deconstructs the "source-target equivalence" and re-terms "ST" as "anterior text" and "translation shifts" as "construal operations".

Fundamentally, translation is a conceptualization or re-conceptualization process. Scholars such as Halverson (2007) and Rojo and Ibarretxe-Antuñano (2013) define the conceptualization in translation as construal operations in the same way as the monolingual act in the sense that in both monolingual and translational act the conceptual content is construed to be linked to the linguistic form. According to Halverson (2013: 48), translation as a construal operation involves the translator's contextualized interpretation of the anterior text (i.e., the ST in traditional terminology), the translator's knowledge of the conventionalized construals, and the online creative generation of translation. In other words, translation is the conceptualization through two or more language activations and construal.

Translation has also been described as a re-conceptualization process by Lewandowska-Tomaszczyk (2010) or a frame operation by Xiao (2017). According to Lewandowska-Tomaszczyk (2010), translation involves a series of cycles of re-conceptualization of the message expressed by the source language text. The message intended by the ST author will first be re-conceptualized by the ST receivers, and then the translator and eventually the TT receivers. In Lewandowska-Tomaszczyk's view, each comprehension act (of the ST and the TT) is a re-conceptualization process and meaning is (re-)constructed in all cycles of comprehension. That is to say, there is no intact meaning transfer across texts, but rather flows from discourse to discourse in each translational act. Lewandowska-Tomaszczyk (2010) also uses construal dimensions such as granularity, focusing, prominence, and perspectives to the meaning generation through re-conceptualization.

Xiao (2017) uses semantic frame as an analytic tool to establish a Frame Operation Model of re-conceptualization. This model suggests that the cognitive processing in translation involves the translator's activation of source language (SL) knowledge through the reading of ST and a re-conceptualization to the target language (TL) meaning potentials for the TT receivers to apprehend. Frame as the mental representation of knowledge offers a good analytical tool for the re-conceptualization. The Frame Operation Model of translation comprises cases of frame correspondence and the translator's operation of frames. Frame correspondence occurs when correspondent or similar frames could be activated in SL and TL cultures. When direct correspondence is difficult to be achieved due to the difference between SL and TL cultures, translators might need to perform operations on frames activated through the reading of ST, such as reducing or adding frame elements, adjusting frame levels, or transplanting SL frames.

Through different theoretical models, the re-conceptualization accounts of translation share the view that translation is cognitive because underlying the observable language shifts are actually the conceptual operations in the translator's mind.

3.2.3 Dynamic and Usage-Based View of Translation

The dynamic and usage-based view of translation holds that translation is a discursive act in which meanings are conceptualized or reconceptualized by the language users (author, SL reader and TL reader, and translator) in a dynamic manner by way of drawing on their full range of knowledge. The usage model of Cognitive Linguistics suggests that each linguistic act is discursive with no distinction between semantics and pragmatics so that meaning is derived by the language user in his/her discursive act. Applied to translation studies, it suggests that translation is a usage event and a dynamic meaning construal, in which the translator as the translating individual is put in the

crucial center as the core cognizer of the situation, the conceptual basis of language and the discursive event (Halverson 2013). In the view of Cognitive Linguistics, meaning of the discourse is conceptualized and subject to objectification, subjectification, or other construal operations such as specificity, trajectory/landmark alignment, prominence, perspective, among others. Croft and Cruse (2004: 98) propose four concepts of dynamic construal of meaning, namely the contextualized interpretation, purport, constraints, and construal operations, which depict how meaning is generated in each discursive act. Halverson (2013: 36–37) adapts the four concepts to a detailed depiction of the dynamic usage-based model of translation, a crucial model that emphasizes the role of the translator's processing of encyclopedic knowledge in the translational act and serves as a best remedy for the weak points of linguistic approaches to translation that were criticized earlier by some cultural or literary theorists.

4. Current Contributions and Research

4.1 Cognitive Linguistics as a Source of Theoretical Models for Cognitive Translation Studies

As was explained in section 3.2, Cognitive Translation Studies has been developing at an accelerating speed with increasing momentum in the past 30 years as a result of methodological advancement and research inspirations from neighboring disciplines such as psychology, neuroscience, and cognitive linguistics (see Shreve & Angelone 2010; Schwieter & Ferreira 2017; Sun & Xiao 2019, for a panoramic view of the field).

Despite the rigorous development gained through empirical research, one of the greatest challenges that Cognitive Translation Studies faces is theoretical construction and model building. As Shreve and Angelone (2010: 12) warn, without a robust theoretical apparatus, it is not possible for us to "integrate and consolidate the massive amounts of empirical data into a consistent understanding of translation and cognition". Muñoz (2017: 559) also cautions that many cognitive translation research projects did not actually rely on solid theoretical foundations and some projects "have been happy to simply pile up their results into a common pool" as if the data themselves were "self-explanatory".

Cognitive Linguistics offers an ideal source of theoretical affordance. Some scholars, either Cognitive Linguists or translation scholars with a strong interest in Cognitive Linguistics, have devoted papers or books to the construction of cognitive translation theories and models, among which are three milestone books on applying Cognitive Linguistics to the theoretical model building of Cognitive Translation Studies. The first book is a monograph by Tabakowska (1993), the earliest systemic attempt at a poetic theory of literary translation based on Langacker's cognitive grammar. The second is a more comprehensive book edited by Rojo and Ibarretxe-Antuñano (2013) entitled *Cognitive Linguistics and Translation: Advances in Some Theoretical Models and Applications*, suggesting that its aim is to build cognitive models of translation based on a wider range of topics in Cognitive Linguistics. This book highlights five significant aspects of applying Cognitive Linguistics to translation (Rojo and Ibarretxe-Antuñano 2013: 14), quoted as follows.

(1) Theoretical aspects of Cognitive Linguistics and translation
It consists of an introduction by the editors and three thought-provoking papers by Halverson, Muñoz and Martín De León. The three papers address the theoretical basis, methodological issues and epistemological discussions of converging Cognitive Linguistics and Translation Studies. These papers might be recommended as a starting point for anyone interested in a Cognitive Linguistic approach to translation researches.

(2) Meaning in Cognitive Linguistics and translation
This group of papers represents the adoption of the cognitive semantic theories to the study of translation, such as frame, conceptual metaphor and metonymy.
(3) Constructions in Cognitive Linguistics and translation
This part adopts the theories of cognitive grammar as an approach to translation, with the symbolic nature and meaning-paring property of grammar as the basis to probe into the classical question of the hard choice between form and meaning in traditional translation studies.
(4) Culture in Cognitive Linguistics and translation
Although culture has been a traditional topic in translation studies, Cognitive Linguistics has offered some innovative views of culture, such as cultural conceptualization and situated meaning construction. Papers in this group are entitled "a cognitive view on the role of culture in translation" and "cultural conceptualization and translating political discourse" and address questions of cognitive cultural conceptualization and translation, a new direction with promising potentials for further exploration.
(5) A step beyond Cognitive Linguistics and translation
The final part of this book also adopts a cross-disciplinary approach by combing Cognitive Linguistics and psycholinguistics to explore the possibility of applying the psycholinguistic theory and methodology to translation studies, including experimental lexical semantics by Feist (2013) and a general psycholinguistic perspective by Hatzidaki (2013).

A more recent book co-authored by Wen and Xiao (2019) devotes, in addition to the introduction and conclusion, each of its 12 chapters to a specific Cognitive Linguistic theoretical model and its implication for translation. This book covers such topics as categorization and translation, conceptual metaphor and translation, conceptual metonymy and translation, polysemy and translation, iconicity and translation, subjectivity and translation, frame and translation, construal and translation, conceptual integration and translation, relevance and translation, and textual cognition and translation.

4.2 Emerging Topics in the Cognitive Linguistic Approach to Translation

Apart from the aforementioned topics and theoretical models of Cognitive Linguistics on translation, some more topics and trends are emerging as new models with promising potentials to be explored. Some of the prominent areas and topics are as follows.

4.2.1 Cognitive Explanation of Translation Universals

Corpus-based translation studies as one of the vigorous branches in translation studies has produced a number of features of translational languages. These features are also called translation universals, defined by Baker (1993) as "features which typically occur in translated text", including for example simplification, explicitation, normalization, and leveling out (the translated text to gravitate around the center of the continuum rather than move towards the fringes). These features might be seen as the linguistic features of translated text since they are summarized through a large-scale observation of texts in the corpus. However, these features simply remain the description of translational languages with less theoretical value if not properly explained. Halverson (2003) suggests that cognitive grammar offers an appropriate explanatory framework for translation universals. Since then, Halverson (2003, 2010, 2013, 2017) has been developing a "Gravitational Pull Hypothesis" to account for the role of cognitive salience in producing translation universals. A further development is the combination of cognitive grammar and bilingualism models in the test of the Gravitational Pull Hypothesis. Muñoz (2013: 86–87) also calls for a cognitive interpretation of translation universals by introducing Langacker's (1987) construal dimensions.

4.2.2 Integration of Cognitive Linguistics with Neighboring Disciplines

In addition to the application of Cognitive Linguistics to translation, cross-disciplinary integration is becoming more evident, including the integration of Cognitive Linguistics with bilingualism or multilingualism, with the study of the bilingual conceptual representation as a potential model for the study of the relationship between the SL and TL conceptual representations in the translator's mind. The following are some of the questions that might be of interest. Is there an order of dominance between the conceptual representations of the two languages involved in translation? Is the translator's activation of languages similar to or different from the bilingual's activation? Schwieter and Ferreira (2017) review how the concepts of bilingualism and multilingualism such as working memory, multilingual lexicon, language control, and lexical selection, are related to translation and interpreting studies.

Recently, neurolinguistic models and methods have been used for the study of the mental mechanism and its role in translation. Neurolinguistic findings have also been applied to improving the performance of machine translation, such as Scott (2018), who simulated the cerebral mechanism in the design of a machine translation model to cope with the problems of complexity and ambiguity, suggesting that neurolinguistics might contribute to further advances in machine translation in the technological instantiations.

4.2.3 Socio-Cognitive Approach to Translation

The socio-cognitive approach to translation is characterized by the combination of cognitive and sociological approaches to the study of translation as something that happens in specific cultural environments and is dependent on those environmental conditions. The socio-cognitive approach adopts a situated, embodied cognition view of translation (see Risku 2002; Risku & Windhager 2013). Applying the concepts of situated cognition, actor-network theory, and activity theory, Hanna Risku and his colleagues have been carrying out ethnographic studies on translation activity and its changes through participation observation (Risku 2014, 2017). This coincides with the embodied cognition view of meaning in Cognitive Linguistics. Lakoff and Johnson (1980) believe that meaning is grounded in bodily experience such as image schemas, while Glenberg (1997) suggests that meaning is grounded in action. These ideas might be incorporated into the situated-cognitive view of translation to develop "a theory of situated imagination in translation, in which the processes of meaning construction are modeled taking into account the support of internal representations in a dynamic way" (Martín de León 2013: 113).

5. Research Methods

As was noted earlier, methodological innovation has been one of the most rigorous aspects of development in translation studies in the past 30 years, especially the innovation from the dominance of theoretical or conceptual methodology to the increasing use of empirical and experimental research methodology, thanks to the advancement of research tools (Xiao & Wen 2012). These new methods have not only largely enriched the methods available for different research designs but also ensured the research findings are based on empirical and experimental evidence. In terms of the focus of observations, Saldanha and O'Brien (2013) classify translation research methodologies into four major types: product-, process-, participant-, and context-oriented research methods. This classification also works for the methods adopted in the Cognitive Linguistic approach to translation studies. A crucial point that we need to bear in mind is that the methods used for the observation of either the product, process, participant, or context do not just serve for the methods or focus of observation, but also serve for the aim of research design from certain theoretical hypotheses, in which Cognitive Linguistic theories might work properly. At the same time, a specific method

might not be used alone in every instance, and translation study is increasingly moving towards the integration of more than one method in one piece of research.

5.1 Product-Oriented Research Methods

Product-oriented research focuses mainly on the textual product that is the outcome of the translating or interpreting process for either a descriptive/explanatory or an evaluative purpose. Usually the analysis of certain texts in the context of production and reception is used to infer the translator's decision making and the cognitive process. As Saldanha and O'Brien (2013: 50) explain, the major methods used in the product-oriented research include critical discourse analysis (CDA) and corpus-based studies. For a Cognitive Linguistic study of translation, CDA is used to explore the issues of ideology in the translation of various genres in Cognitive Linguistic frameworks of language, meaning, and cultural conceptualization, and with the recent frameworks of Critical Cognitive Linguistics (Dirven, Polzenhagen, & Wolf 2007; O'halloran 2003; Stockwell 1999). Corpus-based methods are usually used to identify features or regularities of translational languages with either comparable or parallel corpora to find patterns distinctive of translated texts. In Cognitive Translation Studies, corpus-based methods are applied either to get linguistic evidence for a certain theoretical hypothesis, or as a complement to the process-oriented experimental methods since the integration of corpora and experiments will make up for the defects of each method and "approach the phenomena from a multiplicity of perspectives" (Gilquin & Gries 2009: 9). Given the fact that corpus-based translation studies has been developed into a subfield of translation studies, and that a number of research findings (such as the translation universals) await theoretical explanations, the corpus-based methods will be combined with Cognitive Linguistic theories for the theoretical models with explanatory power for corpus findings such as the Gravitational Pull Hypothesis proposed by Halverson (2003). Another area of applying product-oriented methods in Cognitive Translation Studies is the research on machine translation and/or post-editing product to evaluate the quality of machine translation in comparison with human translation, for instance the research by Yamada (2019) and Jia, Carl, and Wang (2019).

5.2 Process-Oriented Research Methods

Process-oriented research aims to understand the translator behavior, competence, expertise, the cognitive processes, and the relationship between cognition and the translated product (Saldanha & O'Brien 2013: 109). Muñoz (2010) suggests that the notion of translation process should be understood on three levels: (1) the translator's mental states or operations in translation, (2) the sub-tasks of translating, such as reading, typing, researching, etc., and (3) the situatedness of the physical whole process of translation from commissioning of translation project to the receipt of the final translated product by the addressee. As process research gathers data on the online processing by translators, it is deemed to be based on observational evidence, but criticized for the lack of ecological validity. Therefore, process research is often used together with the product-oriented method. The commonly-used empirical methods and tools for gathering process data include introspective methods such as think-aloud protocols (TAPs), retrospective methods such as dialogue protocols or cued retrospection, keystroke logging (for example with Translog), screen recording, eye-tracking, neuro-imaging (such as functional magnetic resonance imaging and positron emission tomography), and galvanic skin response (GSR).

5.3 Participant-Oriented Research Methods

Participant-oriented research not only focuses on the human agents in the translation process, especially the translators, but also includes the interaction or relationship between the

translators and other participants, often with a socio-cognitive approach. As Saldanha and O'Brien (2013: 150) suggest, participants are understood in two senses: the participants involved in the translation process, such as translators, trainers, students, commissioners, etc.; and the participants involved in the research process. That is to say, participant-oriented research follows a social constructivist epistemology in the sense that the knowledge is constructed among the research participants. Therefore, it is human-centered and sociological in nature. The frequently used methods are questionnaires and interviews. In Cognitive Translation Studies, questionnaires and interviews are usually used as complements for product- or process-oriented data, or more often used in the socio-cognitive approach to the interaction between environment, technology aids, and translator behavior.

However, as was mentioned earlier, any method has its defects. A multiplicity of methods, also termed triangulation, have been increasingly used, such as the integration of screen-recording and TAPs (Angelone 2010), keystroke logging and eye-tracking (Dragsted 2010), corpus analysis, keystroke logging, eye-tracking, and retrospection (Alves et al. 2010).

6. Future Directions

Cognitive Linguistics has been developing for more than 40 years, but the attempt at developing a Cognitive Linguistic framework for translation has been rather recent. Cognitive Linguistics has updated our views on language, meaning, and translation, enlarged the focus of translation studies, brought about the transition to more humanized and translator-centered research, and offered some theoretical frameworks and analytic tools. However, further development of Cognitive Translation Studies requires more contributions from neighboring disciplines, especially theoretical constructions from Cognitive Linguistics, since theoretical models are "the paramount concern" for Cognitive Translation Studies (Shreve & Angelone 2010).

First, some Cognitive Linguistic theories that have been used as the framework for Cognitive Translation Studies might need further exploration, elaboration, modification, or extension to be able to address a wider range of topics. Frame Semantics, for instance, might be further developed into a multilingual model for contrastive studies of frames between different languages.

Second, the theoretical models and frameworks of translation based on Cognitive Linguistics should be constructed in close connection and interaction with empirical research. On the one hand, the theoretical construction should take into account its contribution to experimental design and its verifiability or falsifiability by the empirical research. On the other hand, the theoretical construction should respond to the findings of the empirical research so that the theories will be revised and adapted. More importantly, a number of theoretical models have been proposed and need to be re-adapted to empirical research. The translatability of conceptual metaphors is one case, which is gradually being included in experimental research by different scholars.

Third, Cognitive Linguistics might be integrated with other fields of cognitive science to offer a theoretical basis for the models of translational cognition, for instance, psycholinguistics, bilingualism, neurolinguistics, cognitive poetics, cognitive anthropology, among others. This is because translation is linguistic, bilingual, cross-cultural, context-dependent, and cognitive by nature and research on the cognitive aspects of translation needs theoretical and methodological inspiration from more subject fields than just Cognitive Linguistics. A more promising prospect is a time when Cognitive Translation Studies, Cognitive Linguistics, and other neighboring fields form a reciprocal and interactional relationship in the sense that their inspiration is multidirectional among each other rather than unidirectional from other fields towards Cognitive Translation Studies.

Further Reading

Tabakowska, E. (1993). *Cognitive linguistics and poetics of translation*. Tübingen: Gunter Narr. (One of the earlier explorations of translation from the perspective of Cognitive Linguistics with some inspirational ideas on adopting Cognitive Linguistic theory in the modeling of translation.)

Rojo, A., & Ibarretxe-Antuñano, I. (Eds.). (2013). *Cognitive Linguistics and translation: Advances in some theoretical models and applications*. Berlin and Boston: Mouton de Gruyter. (A very comprehensive book dedicated to the theoretical issues and specific topics of applying Cognitive Linguistic theories to translation studies.)

Schwieter, J. W., & Ferreira, A. (Eds.). (2017). *The handbook of translation and cognition*. Hoboken, NJ: Wiley Blackwell. (A practical handbook with a wide coverage of the theoretical and methodological issues in Cognitive Translation Studies, including those concerning Cognitive Linguistics and translation.)

Saldanha, G., & O'Brien, S. (2013). *Research methodologies in translation research*. London and New York: Routledge. (A researcher-friendly book on the research methodologies in translation studies, arranged in a clear order with detailed explanations of how to carry out the translation research and including most cognitive translation research methods.)

Related Topics

cognitive semantics; cognitive grammar; Construction Grammar and Frame Semantics; conceptual metonymy theory revisited: some definitional and taxonomic issues; culture in language and cognition; image schema; iconicity

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COGNITIVE LINGUISTICS AND LANGUAGE PEDAGOGY

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1. Introduction

This chapter explores how cognitive linguistics (CL) may inform, inspire, and enhance language pedagogy. It is important to note that while language pedagogy refers to language teaching methodology and practice in general, this chapter focuses on foreign/second language pedagogy. The reason is twofold: (1) there is a strong need for foreign/second language learning in our increasingly globalized world, and (2) foreign/second language learning and teaching are very challenging endeavors. For simplicity purposes, however, language pedagogy, rather than foreign/second language pedagogy, will be used hereafter. The chapter will cover the following issues: (i) historical perspectives on language pedagogy including new perspectives offered by CL, (ii) critical issues and topics related to the application of CL to pedagogy, (iii) current contributions and research, (iv) recommendations, and (v) future directions in this area of work.

2. Historical Perspectives

Historically, key linguistic theories (e.g., structuralism, behaviorism, generativism, and functional linguistics) have had a significant influence on language pedagogy, with each providing some theoretical foundations for one or more of the dominant language teaching methods in the past century, such as the Audiolingual method and the Communicative Language Teaching (CLT) method. This section provides a brief overview of these theories and their respective influences on language pedagogy.

2.1 Structuralism and Behaviorism

Structuralism (Saussure 1916; Bloomfield 1933) is known for its attempt to provide a scientific description of language based on behaviorism and for its treatment of language as a hierarchical system made up of discrete syntactical and lexical units. Behaviorism (Skinner 1957) views language use and learning essentially as stimuli-bound behavior and holds that language is learned based on behaviorist reinforcement principles whereby children make associations between language and meaning via language stimuli accompanied by positive reinforcement for correct responses and negative reinforcements for incorrect responses. Structuralism and behaviorism greatly influenced

language pedagogy during the 1940s and 1950s, especially the Audiolingual method, which focuses on the accurate learning of language form by having learners perform repeated pattern drills on the language rules being learned.

2.2 Generativism

Like structuralism, generativism (Chomsky 1957) treats language as a system of formal rules, but it differs from the former by focusing mainly on syntax, i.e., on syntactic rules that are responsible for generating all the possible grammatical sentences in a language. Furthermore, it postulates the existence of a universal grammar, which is a subconscious innate system in the human brain that can be easily activated by language input, resulting in successful language acquisition. This innate theory of language acquisition rests largely on an assumed paucity of language input and a supposed ease with which children acquire a language, but both assumptions have been seriously challenged by empirical studies in the past two decades (cf. Tomsello 2003). Yet, long before it was questioned, this innate theory indirectly helped the development of Krashen's (1981) "acquisition vs. learning" hypothesis, according to which language acquisition is an unconscious natural process whereas language learning is a conscious process involving explicit learning, but learning does not lead to acquisition. This view about language acquisition has in turn led to language pedagogies that de-emphasize explicit learning of grammatical rules, as shown in the Natural Approach for language teaching developed by Krashen and Tracy (1983) and the aforementioned CLT, which emerged in the 1970s partly as a response to the failures of traditional teaching methods such as Audiolingual and Grammar/Translation. It is important to note, though, that generativism was not a major influencing theory for CLT. The main theories that helped the development of CLT were Hymes's (1971) concept of communicative competence, and functional linguistics, particularly Halliday's (1973) systemic functional linguistics, described immediately below.

2.3 Systemic Functional Linguistics (SFL)

As its name indicates, SFL focuses on language function rather than form, the focal point of traditional linguistics. This shift from language form to function has had a significant impact on language pedagogy as evidenced by CLT's focus on the ability to use language for various communicative functions. CLT deserves brief attention here because, with its focus on language use (i.e., the ability to communicate) rather than on form, CLT has become arguably the most dominant teaching method since the 1970s and the last well-known teaching method thanks to a fundamental shift of the language teaching profession's interest from teaching methods to successful teaching principles and strategies since the 1990s (cf. Kumaravadivelu 2006). One other important new perspective brought by SFL is its lexico-grammatical approach to language, i.e., instead of treating lexis and grammar as two rigid separate domains, SFL views them as the two ends of one continuum. Such an approach to language has challenged the traditional language pedagogy where lexis and grammar are taught as two entirely separate skills.

2.4 Cognitive Linguistics

As a major new linguistic theory, CL views meaning as central to the study of language. More importantly, CL offers some new perspectives about language and language acquisition which, as Taylor (1993) noted more than 20 years ago, should have important implications for pedagogy. The following are some key new perspectives from CL.

- Language is a symbolic system signifying human conceptualizations where cognitive processes, such as construal and metaphor, play a crucial role. Due to different cultural experiences,

conceptualizations may vary across languages leading to differences in linguistic forms (Robinson & Ellis 2008; Taylor 1993; Tyler 2012).

- Language is a system made up of symbolic units or constructions (i.e., pairings of form and meaning), including fixed, partially-fixed expressions, and schematic constructions or "schematizations of particular expressions" (Langacker 1991: 46). A schematic construction enables speakers to quickly produce new utterances "in conformity with the specifications of the schema" (Taylor 2002: 233). This CL view of language being composed of symbolic constructions collapses the traditional rigid separation between lexis and grammar.
- Linguistic forms are generally not arbitrary, but motivated based on our embodied conceptualizations. Embodied (sensorimotor) experience thus plays an important role in language use and learning (Holme 2009, 2012; Lakoff & Johnson 1999). Exploring the motivations of language usages should make language learning not only more effective but also more interesting than teaching language as an arbitrary system (Boers 2000; Langacker 2008; Taylor 1993).
- Language knowledge is usage-based, rather than innate, i.e., "language is learned from input, using general cognitive mechanisms, sensitive to type and token frequency, resulting in item-specific knowledge and more abstract categories of form-meaning relationships [i.e., schematic constructions]" (Robinson & Ellis 2008: 494). This usage-based theory of language knowledge contrasts sharply with the generative theory of language knowledge being composed of highly abstract rules. In this usage-based theory, language acquisition is essentially the acquisition of the aforementioned three types of constructions that vary in the level of schematicity (Goldberg 2006; Holme 2009): (i) filled constructions (the least schematic and hence least productive), e.g., the past tense morpheme *ed* and the idiom *cut corners*, (ii) partially-filled constructions, e.g., *put someone/something down* and *the Xer the Yer* construction shown in *the more you practice, the better you become*, and (iii) un-filled constructions (the most schematic and productive), e.g., the ditransitive *Cause to Receive* construction as used in *give/send/cook/knit someone something*.

3. Critical Issues and Topics

As relatively new perspectives, CL theories about language and language acquisition naturally challenge some of the existing pedagogies built on traditional linguistic theories. For example, traditional linguistic theories view language usages as being largely arbitrary. Such a view would discourage languages learners and teachers from exploring the motivations behind language usages, which could in turn lead to an overreliance on memorization, making language learning uninteresting and likely less effective. Inspired by CL, many language researchers and educators have explored the motivations of language usages in pedagogy and produced positive results (e.g., Boers 2000; Cho 2010; Hill 2015; Liu 2010; Tsai 2020; Tyler 2012; White 2012). However, with CL being a relatively new comer in the field, research on how its various new theories may inform and inspire language pedagogy has been limited, considering especially the promising potential impacts they may have on pedagogy (Boers 2011, 2013; Littlemore & Juchem-Grundmann 2010). Much more work is thus needed. The following questions are several major critical issues that have been and are still being explored in our endeavor to develop effective CL-informed/inspired pedagogy (CL-IIP hereafter). Each of these major issues includes a few sub-issues/topics.

3.1 How Can the Conceptual Nature of Language Be Capitalized on for Language Teaching?

Because differences across languages in structure and usage have often resulted from different conceptualizations, learning an L2 necessarily involves learning new conceptualizations and categorizations (Robinson & Ellis 2008; Taylor 2012; Tyler 2012). In fact, L2 conceptualizations

and categories are often "in direct competition with those of the learners' L1" and they "represent alternative ways of construing the same reality" (Ellis & Cadierno 2009: 111–12). In this sense, "learning a language involves learning how to construe the world" in this language (Tyler 2012: 86) and requires "re-thinking" in communication (Robinson & Ellis 2008: 499). Consequently, L2 learning is a much more complex and difficult process than L1 learning. Helping L2 learners succeed in their effort is, therefore, a great challenge for language educators including those working with CL-IIP. So far, except for the use of conceptual metaphors to help teach various lexical items, such as idioms and phrasal verbs (as will be shown in the Current Contributions section below), most of the studies on applying conceptualization to language teaching have remained largely theoretical, consisting mainly of either theory-based discussions about why and how conceptual understandings should be taught in L2 teaching, or CL theory-guided examinations of the differences between learners' L1 and L2 conceptualizations (e.g., De Knop & De Rycker 2008; Holme 2012). The work of the latter type is largely contrastive analysis although it differs from behaviorist contrastive analysis in that it is "covert" rather than "overt" and its focus "is not on the distribution of formal elements per se, but on the meanings symbolized by the units" (Taylor 1993: 213). Overall, there has been limited empirical work that actually implemented and tested specific CL-IIPs in teaching conceptualizations for language learning. Hence, how to help language learners successfully acquire L2 structures and usage by understanding the underlying conceptualizations has remained a critical issue for researchers and teachers working on CL-IIP.

3.2 How Can CL Concepts and Analysis Be Made Accessible to Language Learners and Incorporated Naturally into Language Teaching?

Related to the challenges involved in conceptualization-based language teaching is the issue of how to make CL concepts and analysis accessible to language learners. It is a fact that CL has many important concepts that are often unfamiliar to language learners (in fact, even unfamiliar to many linguists who have not studied CL). Explaining and applying these concepts in language teaching naturally involves some CL analyses and explanations aimed to help learners understand not only the concepts, but also, more importantly, the whys and hows of the language structures and usages being taught. Such explanations and analyses, however, take time and are sometimes quite taxing on learners' cognition. In fact, as Broccias (2008) and Tyler (2012) have acknowledged, the need of such explanations/analyses and the amount of time they take have often been the main criticisms directed at CL-IIP. How to provide CL-based explanations and analyses at an optimal level and without using unnecessary CL jargon is an issue of paramount importance. Included in the issue is the question of whether CL concepts-related explanation and analysis may work for all students and whether CL-IIP may need to be adjusted for learners with certain cognitive/learning styles and educational/L1 backgrounds.

3.3 How Can Constructions, Especially Schematic Constructions, Be Effectively Taught?

Given language learning is essentially construction learning, how to effectively teach constructions has been a very important question. So far, while there have been quite a few studies on the importance of constructions in L2 acquisition and on the learning of filled and partially-filled constructions, such as idioms and phrasal verbs (to be discussed in detail in the next section), there has not been much research on the teaching of schematic constructions—the most productive type. An additional challenge for teaching schematic constructions is helping learners understand the constraints on the extensions of a given construction. For example, it is often difficult for L2 learners to know which verbs can or cannot be used in the V+N+N *Cause to Receive* construction, for, whereas *show/tell me the reason* is correct, the structurally identical utterance **communicate/explain me the reason*

is not. In this sense, a challenging issue about how to teach constructions or language in general by using CL-IIP may boil down to finding and providing learners with "descriptively adequate, intuitively acceptable, and easily accessible" explanations for the meanings and usages of the lexicogrammatical constructions being taught (Taylor 1993: 220). One more related issue is to identify what types of constructions (or aspects of language) are most conducive to CL-IIP since it cannot be assumed that CL-IIP will work well for all kinds of language structures and usages.

3.4 What Amount of Input to Provide and When/How to Provide It for Teaching a Given Construction

Given that language acquisition is usage-based, resulting from high exposure to and frequent meaningful use of the target language item, it will be especially helpful to find out the optimum amount of input and the right context and the appropriate manner for the provision of the input. This is not an easy task, however, considering especially the fact that while a high amount of input is crucial for successful language acquisition, L2 learners (especially in the EFL context) generally have only a limited amount of input, provided mainly in the classroom. With only limited input available, figuring out how and when to provide input becomes extremely important.

4. Current Contributions and Research

Since the late 1990s, there have been an increasing number of publications on the development and use of CL-IIP, including research articles and authored/edited books (e.g., Achard & Niemeier 2004; Holme 2012; Jacobson 2018; Littlemore 2009; Masuda, Arnett, & Labarca 2015; Pütz, Niemeier, & Dirven 2001; Tsai 2020; Tyler, 2012) as well as a couple of systematic reviews of empirical studies on the effectiveness of CL-IIP (Boers 2011, 2013). Some of these publications were experimental studies that directly investigated the effectiveness of CL-IIP for teaching various language structures/usages (e.g., Arnett & Deifel 2015; Boers 2000; Buescher & Strauss 2015, 2018; Jacobsen 2018; Masuda & Labarca 2015, 2018; Tsai 2020; Tyler 2012; White 2012). Most of the remaining publications were either those that offered theory-based arguments and suggestions for CL-IIP (e.g., Broccias 2008; Holme 2012; Littlemore 2010) or those that examined L1/L2 language use and produced findings with important implications for CL-IIP (e.g., Ellis, Römer, & O'Donnell 2016; Gries & Wulff 2005; Liu 2010; Liu & Zhong 2016; Martínez Vázquez 2008). The discussion here focuses on the first type of studies, i.e., those that directly investigated the use and effectiveness of CL-IIP, but a brief mention will be made of a few of the latter type. The discussion is organized mainly around the language structures and usages that CL-IIP has been used to teach, beginning with multiword units (MWUs)[1] followed by prepositions (two language areas that have so far garnered the most attention from CL-IIP) and then moving on to structures that have received only limited attention.

4.1 Teaching MWUs

Many of the existing studies on CL-IIP have dealt with the teaching of MWUs (e.g., Boers 2000; Kővecses & Szabó 1996; Liu 2010; Tsai 2020; White 2012; Yasuda 2010). In one of the earliest empirical studies on CL-IIP, Boers (2000) conducted three experiments to examine the effects of CL-IIP in teaching figurative expressions (including not only MWUs but some single words): one experiment on expressions used to express anger (e.g., *blow up* and *erupt*), one on expressions used to portray economic trends (e.g., *creep up* and *push down*), and one on phrasal verbs exclusively (e.g., *cheer up* and *look up*). In each experiment, the CL-IIP group received instruction about the underlying conceptual metaphors for the expressions, e.g., THE BODY IS A CONTAINER FOR EMOTIONS and UP IS MORE/GOOD while DOWN IS LESS/BAD for the expressions for

economic trends and phrasal verbs. The control group received traditional instruction without a discussion on the underlying metaphors. At the end of each experiment, the CL-IIP group significantly outperformed the control group in a test on the use of the taught expressions.

Kővecses and Szabó (1996), White (2012), and Yasuda (2010) each also investigated the effectiveness of CL-IIP on the teaching of phrasal verbs by focusing on the orientational metaphors underlying the particles of the phrasal verbs being taught. Although the specific CL-IIP procedures and research designs varied somewhat across the three studies (with White's study including drawing about the movements/directions of the particles by the students), their results all showed some significant positive effects of the CL-IIPs used in interesting ways. In both Kővecses and Szabó's (1996) and Yasuda's studies, whereas the CL-IIP students did not outperform the control group on the tests of the phrasal verbs that had been taught, they performed significantly better on new phrasal verbs (i.e., those that had not been taught). In White's (2012) study, measurements of learning included both a pre-/post-task and a pre-/post-test where the students were asked to provide explanations about the meanings of the phrasal verbs in their reading passages. The students made gains on both the post-task and post-test although only the gains on the post-test (not the post-task) were significant. More importantly, however, the students provided many more explanations in the post-task and post-test than in the pre-task and pre-test. These results suggest that CL-IIP may enable L2 students to use the learned conceptual metaphors to help understand new language items, a finding that demonstrates arguably a more valuable benefit of CL-IIP.

Unlike the above studies, Tsai (2020) examined the effectiveness of CL-IIP in teaching verb-noun collocations. Specifically, with a study design that involved two experimental groups and one control group, Tsai (2020) compared the effectiveness of a CL-IIP named "concept-based instruction" with that of a "form-focused instruction". In the CL-IIP group, the students first received conceptual and image schema-based instruction on the basic senses of the target verbs to help them understand how to conceptualize verb-noun collocation events based on these basic senses. Then, the students studied the target verb-noun collocations in reading and drew diagrams to strengthen their understanding of the collocations. At the end of the study, the CL-IIP group outperformed the other two groups on both the immediate and delayed post-tests measuring collocation acquisition and retention.

4.2 Teaching Prepositions

Quite a few studies have also examined the effectiveness of CL-IIP in the teaching of prepositions (e.g., Arnett & Deifel 2015; Buescher & Strauss 2015, 2018; Cho 2010; Song, Schnotz, & Juchem-Grundmann 2015; Tyler, Mueller, & Ho 2010, 2012). As one of the early studies in this regard, Cho (2010) compared the effectiveness of CL-IIP against a traditional approach on teaching English prepositions *in/on/at* to Japanese college students. Cho's CL-IIP focused on having students understand how the various meanings of a preposition "were related to one another under one image schema" (Cho 2010: 267), i.e., how most of the meanings were extensions of the prototypical spatial sense of the preposition, by engaging students first in looking at examples and then in drawing a central image schema for each of the three prepositions being learned. The study revealed that the CL-IIP group made significantly more gains than the traditional approach group on both the immediate and delayed post-tests measuring both the prototypical spatial use and the extended abstract use of the three prepositions.

Using a similar research design and a comparable CL-IIP, Song, Schnotz, and Juchem-Grundmann (2015) also studied the effectiveness of CL-IIP on teaching the same three prepositions to 5th–12th grade German EFL students. However, their CL-IIP involved more use of image schema diagrams than Cho's and a discussion of the *trajectory* and *landmark* concepts. Its learning assessment covered three senses of the prepositions: spatial, temporal, and abstract. The results of

the study showed that the CL-IIP group performed significantly better than the traditional group on the post-tests that measured the temporal and abstract uses of the prepositions, but not significantly better on the spatial (literal) use. This finding demonstrates that CL-IIP is especially effective for teaching the extended figurative meanings of prepositions.

The other existing studies on the effectiveness of CL-IIP in teaching prepositions also all produced significant beneficial effects, including Tyler and associates' (Tyler, Mueller, & Ho 2011; Tyler 2012) studies regarding the teaching of English prepositions *to/for/at*, Arnett and Deifel's (2015) study concerning the teaching of German two-way prepositions (e.g., *auf/hinter/neben*), and Buescher and Strauss's (2015, 2018) studies on the teaching of French prepositions *à/dans/en*. It is important to note that, in addition to using schema diagrams and teaching the CL concepts of prototypical spatial/metaphorically extended senses and trajector/landmark, Tyler and associates' CL-IIP also explored the role of "construal" in the use of prepositions.

4.3 Teaching Conditionals, Modals, Schematic Constructions, and Other Language Structures and Usages

Outside of MWUs and prepositions, structures and usages that have received attention from CL-IIP generally have each seen only one or two studies devoted to it. The following briefly reviews a few such studies to help provide some additional information about the scope of the existing research on the use of CL-IIP (i.e., structures and usages covered) and the research designs and methodologies used.

To test whether the addition of a cognitive account in the teaching of the English conditionals would enhance ESL students' learning, Jacobsen (2018) conducted an experiment involving three groups: a control group that received no specific instruction on conditionals, a task-supported group taught with traditional teaching practices supported by learning tasks, and a cognitive group taught with a cognitive account and also supported by learning tasks. Building on the belief that the use of conditionals involves mental spaces, the CL-IIP explained to the students the mental steps involved in the use of conditionals and the explanation was accompanied by a visual chart showing the mental steps. It also taught the students how discourse and situational contexts might affect the use of conditionals. The results indicated that the cognitive group performed significantly better than the task-supported group and the control group on the immediate and delayed tests that measured both comprehension and production of the conditionals.

In a study to find out whether CL-IIP would be effective in teaching English modals to ESL learners, Tyler, Mueller, and Ho (2010) carried out a quasi-experiment involving a control group taught with a traditional pedagogy. Based on the force dynamics theory, their CL-IIP taught the students how the deontic and epistemic uses of each modal were related and how their meanings differ. Their CL-IIP made extensive use of visual diagrams that showed the meanings of the modals based on the specific force dynamics involved. The students engaged in paired activities practicing the use of modals by applying the information they had learned. The results showed that CL-IIP group made significantly more gains on the post-test than the traditional group.

To assess the effectiveness of CL-IIP in teaching schematic constructions, Tyler, Ho, and Mueller (reported in Tyler 2012) conducted an experiment on the teaching of the *Cause to Receive* (N+V+N+N) and *Transfer-Cause Move* (N+V+N+to+N) constructions. Unlike in traditional teaching of these structures where the focus is on form, i.e., the formal syntactic roles of subject, object, and indirect object, Tyler, Ho, and Mueller's CL-IIP drew students' attention to the pairings of form and meaning related to the two constructions by using diagrams to illustrate the meanings of the constructions and the relationship among the giver, receiver, and the thing being given. The CL-IIP also addressed the constraints on the use of the constructions. At the end of the study, the CL-IIP group significantly outperformed the traditional approach-taught control group on both the immediate and the delayed post-tests.

Other language features on which CL-IIP has been tested include, among others, metonymy (Hill 2015), the Russian case system (Lysinger 2015), and metaphor for learning business English (Juchem-Grundmann & Krennmayr 2010). Hill's study examined the effectiveness of a CL-IIP only vs. a CL-IIP combined with a sociocultural theory (SCT)-based interactive component on Japanese EFL students' learning of metonymy. The CL-IIP focused on helping students understand conceptual metonymies and how conceptual metonymies form the basis of linguistic metonymies. The study showed that both groups made significant gains on the post-tests regarding the usage and production but not comprehension of linguistic metonymies. Also, the overall performance of the group that combined CL-IIP with SCT-based interactions was better than the CL-IIP only group, suggesting the benefit of adding SCT-based interactions to CL-IIP. Lysinger's study compared CL-IIP and a traditional approach in teaching the Russian case system. The CL-IIP consisted mainly of the use of diagrams of the relationships of the various cases in Russian. The CL-IIP group outperformed the control group on the post-test. Juchem-Grundmann and Krennmayr (2010) conducted a qualitative study comparing a CL-IIP with a traditional approach in the teaching of business English. The CL-IIP group first studied metaphors in business English and the traditional group focused mostly on the study of new business vocabulary in the assigned readings. Being qualitative in nature, the study did not include any pre-/post-test, but observations and a survey of the students showed that the students in the metaphor group were more active in class and more positive about their learning experience. One interesting practice employed in this study was the use of corpus data to assist metaphor analysis, a practice that could be made more use of in CL-IIP, a point that will be addressed in the Recommendations for Practice section below.

4.4 Studies of Language Use/Acquisition with Implications for CL-IIP

As mentioned above, besides studies that directly examined the effectiveness of CL-IIP such as those reviewed above, there have also been studies that either offered theory-based practical suggestions for CL-IIP (e.g., Broccias 2008; Holme 2012) or examined L2 language use and produced findings with important implications for CL-IIP (e.g., Ellis, Römer, & O'Donnell 2016; Gries & Wulff 2005; Liu & Zhong 2016; Martínez Vázquez 2008). Because the work on theory-based practical suggestions for CL-IIP does not involve any empirical research, the review below covers only empirical studies with important implications for CL-IIP.

One of the first few studies to examine L2 understanding and use of constructions, Gries and Wulff (2005) investigated advanced German EFL learners' understanding of several English constructions, including the *Cause to Receive* and *Resultative* constructions. The results showed that, despite some differences between English and German in constructions, the advanced EFL learners were able to produce the right constructions after priming and they sorted the verbs correctly into the right constructions. Their findings support usage-based language learning theories where "frequency of exposure to, and use of, constructions play a vital rule [role]" (Gries & Wulff 2005: 196). Focusing also on L2 use of constructions, Martínez Vázquez (2008) conducted a corpus analysis of the use of the English *Caused-Motion* construction by EFL learners from six different L1s that fell into two language types (satellite-framed and verb-framed). The study found that learners with a satellite-framed L1 (to which English also belongs) made much more use of this construction than learners with a verb-framed L1, suggesting that L2 teaching of constructions should take learners' L1 into consideration.

Ellis, Römer, and O'Donnell (2016) is the largest CL-guided study of L2 (also L1) use and acquisition of constructions. The results of the study reveal that construction acquisition results from repeated exposure to input and multiple experiences of meaning-making uses of constructions, demonstrating the importance of frequency of input, context, and semantic prototypicality in language learning. Liu and Zhong's (2016) study examined both native English speakers' and EFL/

ESL learners' use of synonyms, using both elicited and corpus data. The study shows that salience (or conventional usage) and construal are two key competing factors in speakers/writers' synonym choice decisions and frequency of exposure plays a crucial role in L2 use/learning of synonyms. These findings suggest that it is important in teaching L2 use of synonymy to first provide adequate input on the most salient collocates of synonyms and then promote an understanding of the role of collocates in synonym use.

In short, the results of the studies reported above have all shown the feasibility and positive effects of CL-IIP. However, caution is needed with this overall finding because, in many of the studies, the research designs and methodologies were not rigorous enough, the sample sizes were small with some studies having fewer than 30 participants, and/or the effect sizes of the results were small—issues we will return to below.

5. Recommendations for Practice

Based on the findings from the above-reviewed research, the following practices should be promoted in the implementation of CL-IIP. First, as many of the studies have demonstrated the effectiveness of using visuals (particularly visual diagrams), teachers should try to include ample visuals to help students better understand the underlying motivations for the language structures and usages being taught and the motivated meanings of these structures and usages. It is important to note that while some scholars (e.g., Holme 2012) have also called for extensive use of embodied activities in CL-IIP, only drawing of diagrams appears to have been used (e.g., Cho 2010; Tsai, 2020; White 2012). No other types of embodied activities seem to have been used. It will be important for teachers to try more variety of embodied activities, especially for young/younger learners.

Second, given that CL-IIP typically involves some CL-guided explanation and analysis of language usages and that learners often have different cognitive/learning styles and educational/L1 backgrounds, it is imperative that teachers make any necessary adjustments in their CL-IIP to accommodate the needs of students who may have difficulty following instruction from the planned CL-IIP. Furthermore, it is generally advisable to minimize the use of CL terms and optimize the amount of CL-guided data analysis and explanations.

Third, as some of the studies (e.g., Jacobsen 2018; Hill 2015) have suggested, combining CL-IIP with other approaches/practices, such as SCT-based interactions and the use of corpus data, can make teaching more effective. Hence, whenever and wherever appropriate, teachers are encouraged to incorporate proven practices from other approaches that align well with CL-IIP as well as make good use of corpora. The inclusion of corpora is worth particular consideration because, with rapid advances in computer technology and corpus linguistics, many new useful corpora of various languages and registers/genres have become available along with many new powerful and user-friendly corpus search/analysis tools, making the use of corpora more feasible, applicable, and fruitful for language learning and research (Ellis, Römer, & O'Donnell 2016; Liu 2010). CL-guided corpus research has been proven useful in helping uncover and develop what Taylor (1993: 220) called for: "descriptively adequate, intuitively acceptable, and easily accessible" explanations for teaching various lexico-grammatical constructions and usages (e.g., Ellis, Römer, & O'Donnell 2016; Juchem-Grundmann & Krennmayr 2010; Liu 2010).

Fourth, as Boers (2013) has correctly pointed out in his discussion of the use of CL-IIP in vocabulary teaching, for CL-IIP to be more successful, teachers and researchers should try to align their work closely with "mainstream" (i.e., all non-CL-IIP) research on language pedagogy because mainstream research on language teaching has identified many effective practices and important issues, such as judicious "selection [of the target language items and the input needed], the desirability of distributed learning, and the need to cater for complementary types of knowledge" (Boers 2013: 208). In other words, teachers and researchers working on CL-IIP should consider

incorporating many of the existing proven practices, pay attention to the important pedagogical issues already identified in the field, and provide students with all the necessary knowledge and skills (besides CL-based, often explicit knowledge about the motivations and patterns of language) for successful language learning. For example, in teaching prepositions, whereas it is very helpful to explore their underlying metaphorical motivations and semantic networks, it is not advisable to teach all the meanings of a preposition at once because mainstream research has shown this practice may often cause confusion.

6. Future Directions

Based on recent research trends and considering what might be likely gaps in the work on CL-IIP, the following appear to be the future directions for work on CL-IIP. First, because of the promising positive effects of CL-IIP that existing research has shown, more teachers and researchers will and should join the endeavor for developing and using this relatively new promising pedagogical approach. With growing interest, there will be more effort to expand the scope of the language structures and usages taught by CL-IIP. As shown above, although MWUs and prepositions have so far been the only two areas that have received substantial attention from CL-IIP, recent years have seen studies on using CL-IIP to teach other language structures and usages, such as the English conditionals and the Russian case system (e.g., Jacobsen 2018; Lysinger 2015). More work will need to be done to include the teaching of other challenging language structures and usages, such as the use of article systems and tense/aspect.

Second, given the criticism of CL-IIP for involving data/analysis-overloading and a high level of cognitive demand (Broccias 2008; Tyler 2012), we can expect to see more research trying to explore and find the optimal amount/level of analysis and to make CL concepts and analysis more accessible to learners. Third, given the benefits of combining CL-IIP with other proven approaches/practices that research has shown, it is highly desirable and likely to see more research on incorporating other approaches. The inclusion of corpora in CL-IIP will continue to be an area with growing research thanks to its tremendous potential.

Finally, as noted above, experimental research on the use of CL-IIP has been increasing, but much more such research of higher quality is needed in our quest for convincing evidence of the effectiveness of this promising pedagogy. As Boers's (2011, 2013) surveys and the above review have shown, many of the existing (quasi)-experimental studies were small in scale and had results with very small effect sizes. Some of them also used research designs and methodologies that lacked high rigor. Hence there should be more well-designed rigorous large-scale studies as well as some longitudinal studies, including studies with a focus on testing CL-IIP in teaching learners of different cognitive/learning styles and educational/L1 backgrounds. In addition, CL-IIP will also benefit from more classroom-based research because such research may provide valuable information that experimental research cannot offer and, so far, there has been little classroom-based research on CL-IIP. With more research being done that uses different research methodologies and offers different perspectives, we can certainly expect stronger and more convincing evidence for CL-IIP to emerge.

Note

1 The term MWU is used broadly in this chapter to refer to a variety of habitual expressions consisting of two or more words, including collocations, idioms, phrasal verbs, formulae, and proverbs.

Further reading

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CL-IIP in teaching vocabulary, offering a close and in-depth look at how CL-IIP may be used to teach one specific important language aspect/skill.)

Holme, R. (2009). *Cognitive linguistics and language teaching.* New York: Palgrave. (This book provides a quite comprehensive coverage of the theoretical bases of CL-IIP as well as many suggested specific teaching activities. It may serve as a good introduction to CL-IIP.)

Littlemore, J., & Juchem-Grundmann, C. (Eds). (2010). *Applied cognitive linguistics in second language learning and teaching. AILA Review* (Special Issue)*, 23.* (This special journal issue consists of a clear introduction article on the key issues related to the application of CL to language teaching and eight other articles regarding the use of CL-IIP. These chapters include empirical studies, research synthesis, and theory-based suggestions for CL-IIP.)

Related Topics

concepts and conceptualization; construal; construction grammar and frame semantics; motivation; standard and extended conceptual metaphor theory; image schema

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33

COGNITIVE LINGUISTICS AND SECOND LANGUAGE ACQUISITION

Han Luo

1. Introduction

Cognitive linguists have been interested in the relationship between linguistic description and language learning from the very beginning (Achard 1997; Taylor 1993). There has been a consensus among scholars that the very foundations of cognitive linguistics (CL) make it well suited for shedding light on language learning and teaching (Holme 2012; Langacker 2008; Pütz 2007; Tyler 2017; Yu & Wang 2018). Not surprisingly, "applications of CL to issues in second language learning emerged within a few years of the earliest publications in theoretical CL" (Tyler 2017: 73). Since then, research on the application of CL to second language learning and teaching has grown substantially in the past two decades. Efforts in this area have been widely documented in monographs (e.g., Holme 2009; Littlemore 2009; Littlemore & Low 2006; Tyler 2012), journal special issues (e.g., Boers & Littlemore 2003; Ellis & Cadierno 2009; Littlemore & Juchem-Grundmann 2010; Tyler & Ortega 2016), and edited volumes (e.g., Achard & Niemeier 2004; Boers & Lindstromberg 2008; Robinson & Ellis 2008; Tyler, Huang, & Jan 2018), in addition to numerous journal articles (e.g., Boers 2000a, 2000b; Boers & Demecheller 1998).

Many scholars have argued eloquently for the potential of CL in second language acquisition (SLA) investigation and language pedagogy. For example, Langacker (2008) views three basic notions of CL—the centrality of meaning, the meaningfulness of grammar, and its usage-based nature—as providing a useful basis for language instruction. Similarly, Holme (2012) proposes a pedagogical model for the second language classroom based on four tenets of CL, i.e., the embodied learning principle, the principle of lexico-grammatical continuum, the conceptualization principle, and the usage principle. Taylor (1993: 219) explores the possibility of utilizing the insights of CL in constructing a pedagogical grammar to reduce "the perceived arbitrariness of the foreign language system." Archard (1997: 159) demonstrates that CL constitutes a valid framework for SLA investigation "because of its explanatory power of the formal properties of linguistic forms and acquisition processes, and because it affords a satisfying conceptual integration of the structural and social aspects of L2 acquisition."

The usage-based principle lies at the heart of the connection between CL and SLA. In the usage-based model of language (Bybee 1995; Croft 2000; Langacker 2000), knowledge of language is acquired through use. This view of language learning is "not dissimilar to traditional theories concerning the role of input, interaction and output" (Littlemore & Juchem-Grundmann 2010: 1)

and thus provides a unified theoretical framework for various existing approaches in SLA. In addition, CL adds to the usage-based view with "a detailed description of the cognitive processes that are at work in language and thought enabling people to extract language knowledge from language use" (Littlemore & Juchem-Grundmann 2010: 1), which gives rise to a plethora of CL-inspired work on second language learning and teaching.

In order to explain the impact of CL on SLA research and language pedagogy, the following sections of this chapter will first discuss the key tenets of CL and their implications for SLA, and then move to the usage-based theory of language acquisition, followed by a review of CL-inspired approaches to L2 instruction. Finally, this chapter concludes with suggestions for future research.

2. Key Tenets of Cognitive Linguistics

CL is a relatively new approach to the study of language that emerged in the 1970s as a reaction against the dominant generative grammar and truth-conditional semantics. In the CL view, some of the main assumptions underlying the generative approach to syntax and semantics are not in accordance with the empirical evidence in linguistics, psychology, and other fields (Lakoff 1987). Three major hypotheses guide the CL approach to language (Croft & Cruse 2004): (1) language is not an autonomous cognitive faculty; (2) language is usage-based; and (3) meaning is conceptualization.

The first hypothesis is opposed to the generative tenet that language is an autonomous cognitive faculty separated from non-linguistic cognitive abilities. In the CL view, "language is an integral part of human cognition" (Langacker 1987: 12). Two accompanying propositions following this hypothesis are: (1) linguistic knowledge and other types of knowledge are similarly represented; (2) the cognitive processes that govern language use are in principle the same as other cognitive abilities (Croft & Cruse 2004).

Central to the second hypothesis is the belief that knowledge of language emerges from language use. Generative grammar and truth-conditional semantics are reductive in the sense that maximally abstract and general representations of grammatical form and meaning are sought after and many other linguistic phenomena are relegated to the periphery. In the CL view, however, linguistic knowledge of semantics, syntax, morphology, and phonology is built up from our cognition of specific occasions of use in a bottom-up fashion. Grammatical rules of language are seen to be acquired in the inductive process of abstraction and schematization from re-occurring linguistic expressions. The linguistic system is, therefore, a massive and highly redundant inventory of conventional constructions where both abstract rules and specific expressions are stored together for language use (Langacker 1987).

The third hypothesis views meaning as conceptualization. In the CL view, language is seen as a product of human mind through conceptualization mediated by the precise nature of our bodies and our unique neuro-anatomical architecture (Lakoff & Johnson 1980). Language is thus experientially-based and embodied; language does not directly mirror the objective world, but reflects human conceptualization of reality. The meaning of an expression does not reside solely in the inherent properties of the entity or situation it describes, but also involves the way we choose to portray this entity or situation mentally. Thus, an objectivist truth-conditional view of meaning is regarded as too simplistic. Meaning should also be seen as related to subjective construal of entities and events in the world.

The three basic tenets of CL are interrelated and have important implications for language acquisition theory. The generative approach advocates a separation of language use (performance) from the more abstract knowledge of language structure (competence) and argues for the existence of innate syntactic knowledge which provides children with an abstract Universal Grammar to be triggered by specific languages they hear in language acquisition. In contrast, CL does not draw

a line between language knowledge and language use; instead, knowledge of language is seen as constructed through usage events. The usage-based nature of CL recognizes the impact of usage on the cognitive representation of language (Bybee 2008).

3. Usage-Based Theory of Language Acquisition

3.1 First Language Acquisition

The usage-based theory of language acquisition has been primarily informed by research on first language acquisition (Tomasello 2003, 2015). The central problem of first language acquisition is "how children create complex and abstract linguistic constructions in the language they are learning" (Tomasello 2007: 1098). Do children come to language learning with innate, biologically-given Universal Grammar so that they do not really need to learn grammar but just require minimal exposure to the language to trigger the learning of the particularities of the language? Or do children come to language learning with only general cognitive abilities and thus need to start language with the learning of the particularities and then gradually expand concrete, specific utterances to more abstract grammatical constructions? Considerable research in first language acquisition in the last twenty years provides support to the second alternative (Ellis & Wulff 2015).

Researchers who adopt a usage-based view of language argue that "the child learns language from actual usage events, i.e., from particular utterances in particular contexts, and builds up increasingly complex and abstract linguistic representations from these" (Lieven & Tomasello 2008: 168). Instead of first learning words and then learning how to combine them together with syntactical knowledge as predicted by generativists, children start to learn whole adult constructions, i.e., form-function parings, from the very beginning to achieve communication goals, which will be further decomposed and analyzed into linguistic components at a later stage (Tomasello 2007: 1100).

The core of usage-based theory of language acquisition assumes that linguistic structure emerges from language use (Tomasello 2003). Children acquire linguistic knowledge from the language they hear; linguistic knowledge is learned and represented in the form of constructions (De Ruiter & Theakston 2017). The acquisition of abstract and complex grammatical constructions does not occur instantly with trigger from only minimal linguistic exposure; rather, it goes through a number of stages via repeated exposure to specific constructions in specific contexts and constructions of similar types in various contexts.

Children start language by learning low-scope, lexically-specific, item-based constructions, also known as frozen phrases, such as *I dunno* or *what's that?* Initially, each of these constructions is learned and used as a whole and the internal structure of the constructions is not understood. With increased exposure to item-based constructions such as *I wanna play*, *I wanna go*, *I wanna eat*, children start to realize utterances can share form and meaning, and slot-and-frame constructions (e.g., *I wanna X*) begin to occur. At some point, children are able to insert a novel item into the slot, indicating that a form-function abstraction has been made and schematization has occurred. As development proceeds, children will abstract a fully schematic construction for some high-frequency constructions such as the English transitive. Full syntactic schematicity, however, is not the final stage of children's grammatical development as the child still needs to abstract the relations between constructions. When the child is able to transform an utterance in one construction to another related construction (e.g., from a declarative to a *wh*-question), this is evidence that abstraction of relations between constructions has occurred (Lieven & Tomasello 2008: 171).

Ample empirical evidence has lent support to the usage-based view of L1 acquisition (see De Ruiter & Theakston 2017; Lieven & Tomasello 2008; Tomasello 2003 for detailed reviews). For example, Lieven and colleagues have used dense corpora and the 'traceback' method to analyze adult-child conversations, focusing on identifying the relationships between the most recent multiword utterances produced by a child in a set period and all previous linguistic output in that time

period. Multiple studies (e.g., Lieven, Salomo, & Tomasello 2009) have found that the vast majority of seemingly novel utterances can be traced back to earlier utterances in the transcript, suggesting that children's linguistic creativity derives from item-based, lexically-specific constructions. This finding not only applies to simple constructions in the very early stages of language acquisition, but is also supported by empirical research on syntactically complex constructions such as English sentential complements (e.g., *I think I can do it*) (Diessel & Tomasello 2001).

It is, however, still not completely known how children make abstraction and schematization happen and eventually arrive at the complex and abstract grammatical system attributed to adult speakers. Tomasello (2003) proposes that children are equipped with two sets of cognitive skills: intension-reading and pattern-finding, which make language acquisition possible. Children need the skill of pattern-finding to go productively beyond specific utterances they experience in various usage events to create abstract constructions or schemas. Pattern-finding can be understood as a summary term for cognitive processes such as categorization, analogy, abstraction, schematization, and generalization, which is "a central cognitive construct in the so-called usage-based approach to the acquisition of grammar" (Tomasello 2015: 90).

3.2 Second Language Acquisition

It is by now very well established that native speakers' linguistic knowledge is represented and learned in the form of constructions. It is thus more than natural to ask whether L2 learners also demonstrate the psychological reality of constructions in their second language and whether constructions play a role in L2 acquisition.

Mounting evidence has shown that "constructions also underpin L2 learners' linguistic competence" (Ellis & Wulff 2015: 411). For example, Jiang and Nekrasova (2007) used online grammaticality judgment experiments to examine the representation and processing of formulaic sequences by L2 learners. L2 English learners and native English speakers were tested with formulaic and nonformulaic phrases matched for word length and frequency (e.g., to *get a chance* vs. *to get a drink*). They found both English native speakers and L2 English learners responded to formulaic phrases more quickly and with fewer errors than to nonformulaic controls, providing clear and straightforward support for L2 learners' implicit knowledge of constructions (i.e., formulaic sequences). Gries and Wulff (2005, 2009) demonstrated that L2 learners also have constructions through various types of psycholinguistic and corpus evidence, such as L2 syntactic priming effects for a variety of constructions and L2 learners' tendency to sort sentences by construction.

Abundant research has also been done in SLA to examine the role of constructions in L2 acquisition. For example, Eskildsen and Cadierno's (2007) research on L2 acquisition of the *do*-negation construction (e.g., *I don't know*, *you don't think*, *he doesn't want*) showed that the learning of *do*-negation was very much restricted to the specific form *I don't know* at the beginning. With increased exposure to various other instantiations of this construction in the input, the abstraction of *do*-negation gradually happened and the use of other verbs and pronouns in this construction then gradually started to appear. Ellis and Ferreira-Junior (2009) examined longitudinal data for naturalistic L2 English learners and found that these adult L2 learners' use of verbs in frequent verb argument constructions could be traced back to their input experience.

Moreover, Ellis (2003) raised the question whether second language acquisition also follows a common pattern of developmental sequence as in first language acquisition, i.e., from lexically specific constructions to slot-and-frame patterns to fully productive schematic patterns. Later, substantial longitudinal research lent support to the existence of this sequence in the process of L2 acquisition. For example, Myles (2004) collected extensive data (both longitudinal and cross-sectional) on a group of L2 French learners. These data showed that prefabricated constructions beyond learners' grammatical competence were very common in early L2 production. Moreover,

syntactically complex formulaic chunks coexisted with low-scope constructions (e.g., verbless or untensed sentences) for extended periods of time. Myles (2004) argued that these grammatically advanced chunks provided learners with a databank of complex structures and drove the L2 acquisition process forward.

Now that there is a growing consensus that language is acquired through usage and in the form of constructions, the next logical questions are: How are constructions acquired? What factors contribute to L2 acquisition? This is where traditionally researched topics in the field of SLA (e.g., the role of input and learner cognition) converge nicely with the usage-based model. A wide range of psycholinguistic factors have been identified as contributing to the process of the learning of constructions:

> factors relating to the form such as frequency and salience; factors relating to the interpretation such as significance in the comprehension of the overall utterance, prototypicality, generality, redundancy, and surprise value; factors relating to the contingency of form and function; and factors relating to learner attention, such as automaticity, transfer, overshadowing, and blocking.
>
> *Ellis & Wulff 2015: 418*

Among all these factors, frequency effects and prototype effects have the most direct implications for second language teaching and learning.

Recent research has shown that "frequency of use plays an important role in determining cognitive structures" (Bybee 2008: 218). There are two types of frequency: token frequency and type frequency. Token frequency counts the number of times a specific construction (e.g., a morpheme *[s]*, a word *but*, a phrase *have a look*, or even a sentence *I don't know*) appears in the input. Type frequency only applies to patterns of language and refers to the number of items that exemplify a linguistic pattern. For example, in terms of English past tense, the regular suffix *-ed* has a much higher type frequency than the pattern exemplified by *know*, *knew* and *blow*, *blew*. Token frequency promotes entrenchment and has a conserving effect. Thus, high token frequency reinforces the conservation of specific constructions. In contrast, type frequency is a major indicator of productivity of a construction. Learners need a certain amount of type frequency to uncover the inner structure of linguistic constructions, schematize linguistic patterns, and create novel forms based on schematizations at various levels (Bybee 2006).

Research has also shown that categories have an internal structure (e.g., Rosh & Mervis 1975), which means some members might be better or more representative examples of a category than others. The prototype of a category is the best example of that category. For example, houses may be seen as more prototypical examples of the category BUILDING than sheds. It often takes less time to categorize representative examples and prototypical linguistic constructions are usually learned faster. As Tomasello (2003) has argued for child language acquisition, prototypical verbs seem to act as "verb islands," which gradually expand and give rise to the verb argument construction. Similarly, in second language acquisition, Ellis and Ferreira-Junior (2009) found that L2 learners' first acquired verbs are often prototypical and generic ones corresponding to the central meaning of a given construction.

Notably, "prototypicality and token frequency interact: the higher the token frequency of an exemplar, the higher the likelihood of this exemplar becoming the prototype" (Ellis & Wulff 2015: 420). In language acquisition, linguistic constructions with high token frequency also tend to be prototypical instantiations of the construction schema, which are often easier to acquire. Therefore, Jing-Schmidt (2015: 11) translated the frequency-based and prototype-driven nature of second language acquisition into a couple of pedagogical principles: (1) "First teach high-frequency items with prototypical meanings," and (2) "then strengthen the pattern by lexical expansion into low-frequency items."

4. Applications of CL to L2 Learning and Teaching

The previous section discussed how and why CL and SLA converge: The usage-based view of CL works as a theoretical framework unifying traditional and emergent SLA research (e.g., the role of input, output, and cognition). This section focuses on CL-inspired work on L2 learning and teaching, i.e., the benefits of applying specific CL concepts to language learning and pedagogy. A wide range of CL concepts have been identified as of particular relevance to L2 learning and teaching, including (but not limited to) construal, categorization, encyclopedic knowledge, metaphor, metonymy, embodiment, motivation, and construction grammar, which are related to one another in various ways (Yu & Wang 2018). According to Littlemore and Juchen-Grundmann (2010: 2), these concepts correspond to the key cognitive processes involved in "extracting language knowledge from language use," which, therefore, inevitably have a natural impact on second language learning and teaching.

As I see it, applied CL-oriented language pedagogy centers around the notion of reduced arbitrariness of language. In the traditional view, there are sharp distinctions between form and meaning, and between grammar and lexicon. It follows that many areas of language (such as grammar, idioms, and various abstract senses of a single lexical item) are arbitrary and difficult to learn. However, in the CL view, "large areas of language structure … turn out to be motivated as part of our conceptual system" (Pütz 2007: 1145). Therefore, many language areas such as grammatical rules and idioms that are traditionally treated as meaningless or arbitrary "are re-visioned as far more systematic and governed by regular processes, and are thus amenable to instruction" (Tyler 2017: 75). The rest of this section focuses on five CL concepts, i.e., metaphor, metonymy, polysemy, construction grammar, and construal, demonstrating how these concepts can offer explanations for the systematicity of various aspects of language and potentially remove the arbitrariness from language teaching.

4.1 Metaphor

Thanks to Lakoff and Johnson's (1980) influential work on conceptual metaphor theory, metaphor is by far the most studied concept in applied CL and generates a substantial body of research on its application in second language vocabulary acquisition. According to Lakoff (1987), metaphor is conceptual in nature and basic to human cognition and language behavior, which allows people to conceive abstract concepts such as time and emotion in terms of concrete entities. For example, in the conceptual metaphor, LOVE IS JOURNEY, a complicated human feeling, love (an abstract concept), is viewed metaphorically as journey (a more concrete life experience). Journey constitutes the source domain and love constitutes the target domain. Source domains are usually common, prototypical, simple, and concrete, whereas target domains are often abstract, complex, and new.

In the past twenty years, a large number of studies have explored the benefits of applying conceptual metaphors to vocabulary instruction, including theoretical discussions (e.g., MacLennan 1994) and experimental investigations (Boers 2000a, 2000b; Boers & Demecheleer 1998). An in-depth review of research on the use of metaphor in structuring vocabulary teaching can be found in Chapter 2 of Littlemore and Low's (2006) monograph. All these studies have produced promising results. For example, Boers (2000a, 2000b) designed experiments to demonstrate the effectiveness of enhanced metaphorical awareness on the part of L2 learners. As figurative expressions can often be traced back to a common metaphoric theme or source domain, the findings showed that alerting learners to these metaphoric themes or source domains could facilitate retention of new figurative expressions, creating an innovative channel for vocabulary acquisition.

In L2 vocabulary acquisition, lexical items associated with highly abstract, opaque, or seemingly arbitrary meanings pose particular difficulty for L2 learners. Conceptual metaphors have the

potential to unveil the meaning extension processes of abstract or idiomatic meanings of linguistic expressions. Not surprisingly, special attention has been given to the application of metaphor to the teaching and learning of prepositions (e.g., Boers & Demecheleer 1998), idioms (e.g., Kövecses & Szabó 1996), and phrasal verbs (Rudzka-Ostyn 2003).

4.2 Metonymy

Metaphor and metonymy are viewed by cognitive linguists as two fundamental mechanisms of human cognition (Lakoff & Johnson 1980) as they allow us "to use what we know to infer information about what we do not know" (Littlemore 2009: 107). In the CL view, metonymy is defined as "a cognitive process whereby one concept is used to mentally activate (i.e., 'to make us think of') another concept with which it is closely related in experience" (Barcelona 2010: 134). Linguistic metonymy is exemplified by using expressions such as the White House and Number 10 to refer to the US and British Governments. Like metaphor, metonymy can also be conceptual. For example, the conceptual metonymy PART FOR WHOLE underlies linguistic expressions such as "nice set of wheels" or "he fell asleep at the wheel," in which the wheel, a part of a car, is used to refer to the car as a whole (Littlemore 2009: 109).

Despite a wealth of research on metonymy in CL in the last two decades (Kövecses & Radden 1998; Littlemore 2015), studies on the L2 acquisition of metonymy have been rather scarce. Littlemore (2009) warns that metonymy is likely to present a significant challenge to second language learners because it serves a variety of important functions in language, such as reference, relationship-building in discourse communities, the expression of evaluative attitudes, the creation of euphemism, humor, and vagueness, and pragmatic inferencing in indirect speech acts. Since plenty of research shows that enhanced metaphor awareness facilitates retention (e.g., Boers 2000a, 2000b), scholars have suggested that an explicit focus on metonymy in the second language classroom may also aid comprehension and retention of figurative language (Barcelona 2010; Littlemore 2009). In recent years, empirical research on the acquisition of metonymy has started to emerge and provide support for the benefits of awareness-raising of metonymy (e.g., Slabakova, Cabrelli, & Kang 2016).

4.3 Polysemy

It is very common for linguistic units to have multiple meanings and polysemy is a much-studied linguistic phenomenon. In the traditional view, polysemy is largely arbitrary and poses immense challenges for L2 learners and teachers. However, in the CL view, the various senses of a word are interrelated to form a semantic network, in which the basic sense stands in the center and other more abstract senses radiate towards the margins.

In the past decades, cognitive linguists have analyzed the systematic polysemy networks of a large number of linguistic units with special attention given to prepositions and particles (e.g., Tyler & Evans 2001, 2003). In these studies, the abstract senses of a word are semantic extensions of the basic sense, systematically motivated through various cognitive processes such as metaphor, metonymy, profiling, vantage point, pragmatic strengthening, and framing (Luo 2019). Many scholars (e.g., Boers & Linstromberg 2006; Lakoff 1987; Maclenman 1994) believe that learning the motivation behind the systematicity of the semantic extension processes can facilitate the learning of less transparent meanings of linguistic expressions.

Numerous studies have been conducted to investigate the effectiveness of applying CL-based analysis of polysemous meanings to second language learning and teaching, and produced positive results (Tyler, Mueller, & Ho 2011; Verspoor & Lowie 2003; Wong, Zhao, & MacWhinney 2018). These studies adopted a variety of ways to teach the connections between the core sense and the

extended senses in the polysemy networks, for example, by presenting multiple meanings of words in terms of radial categories (Verspoor & Lowie 2003), using diagrams and graphics to illustrate semantic extensions (Tyler, Mueller, & Ho 2011), or utilizing diagram-based explanations via a computer-based tutorial system (Wong, Zhao, & MacWhinney 2018). All found the CL-inspired approach facilitated L2 learning.

4.4 Construction Grammar

After Fillmore, Kay, and O'Connor's (1988) seminal work on *let alone*, the notion of Construction Grammar (CG) has been explored in various forms in CL, among which Golberg's (1995, 2006) model has been the most widely studied to date. All these models, however, share the same central tenet: constructions are the basic units of language. Although empirical research also attests to the existence of constructions in L2 (Gries & Wulff 2005, 2009), implicit learning of constructions may not happen as naturally to L2 learners due to the fact that L2 learners receive substantially different types of input as compared to children. Therefore, teaching is needed to compensate for L2 learners' input-poor environment (Holme 2010a). However, the question of how language acquisition and pedagogy can benefit from a CG-based approach has been a relatively neglected area in CG research. Discussions devoted to this topic include a recent edited volume on Applied Construction Grammar (De Knop & Gilquin 2016), a book chapter in Littlemore (2009), and a few journal articles (Holme 2010a, 2010b).

Scholars agree that many features of CG have a role to play in the second language classroom (Littlemore 2009), among which two are of particular relevance. First, grammatical constructions carry their own meanings, independent of the words they contain. The meanings of grammatical constructions are not arbitrary, but rather a result of human conceptualization of world experience. For example, the caused-motion construction (e.g., *Jake pushed the vase off the table*) corresponds to the Caused Motion Event (Goldberg 1995) as experienced in the real world. The explicit teaching of the meanings of abstract grammatical constructions may counterbalance L2 learners' low exposure to the constructions and thus facilitate L2 acquisition. Second, like lexical items, the meanings of grammatical constructions also exist in radial categories. For example, the prototypical meaning of the verb-particle syntax in English corresponds to the motion event, which can be semantically extended to the state change event and aspect event (Luo 2019). Scholars thus suggest that L2 learners should start the use of a path-breaking verb in a construction in its prototypical meaning (Holme 2010a). Existing empirical research (Holme 2010b; Sung & Yang 2016) has provided limited but encouraging evidence for the effectiveness of CG-inspired pedagogical interventions in the second language classroom.

4.5 Construal

A key claim of CL is that human beings are capable of mentally construing a conceived situation in alternate ways (Langacker 1987; Fauconnier 1997). Construal is defined as "the way a speaker chooses to 'package' and 'present' a conceptual representation, which in turn has consequences for the conceptual representation that the utterance evokes in the mind of the hearer" (Evans & Green 2006: 536). Therefore, the meaning of an expression does not reside solely in the conceptual content it describes, but also significantly involves how that content is construed (Langacker 1987).

The notion of construal has been employed by cognitive linguists to explain a wide range of linguistic phenomena such as the relationships between varying but related syntactic constructions (Goldberg 1995, 2006), the English article system (Verspoor & Hong 2008), and English aspect (Talmy 2000). For example, in Luo's (2017, 2019) CL analysis of the particle placement of English transitive particle verbs, the continuous order (e.g., *He picked up the pen*) designates the holistic

construal of an agentive motion event, whereas the discontinuous order (e.g., *He picked the pen up*) reflects the sequential construal of the same conceptual scene.

In addition to speaker choice on how to represent events, construal also operates at a second level: "languages themselves have inbuilt, conventional ways of construing events and phenomena that are at times impossible to avoid" (Littlemore 2009: 14). This means learning a second language often involves learning to see the world and present phenomena from slightly different perspectives, and that is exactly why many scholars believe L2 construal patterns deserve explicit instruction (Achard 2008; Littlemore 2009). An increasing amount of empirical research shows that explicit teaching of construal benefits L2 language learners and can be utilized as an effective pedagogical tool in the second language classroom (Achard 2008; Verspoor & Hong 2008).

5. Conclusion

The impact of CL on SLA research "is expanding at an ever accelerating rate" (Tyler 2017: 89) and this chapter focuses on exploring why this is the case. The contributions of CL to the field of SLA can be discussed at two levels: theoretical and practical.

Theoretically, the usage-based thinking inherent in CL is convergent with existing findings and emerging developments of various branches of SLA research and thus "provides a habitus for research that will hold great promise for the future of the field" (Ortega 2015: 353). The new theoretical framework of SLA, i.e., the usage-based theory of language acquisition, in turn, leads to an exciting, emerging trend of L2 theorizing by integrating CL with other models of language such as Sociocultural Theory, Complex Dynamic Systems Theory, and Conversational Analysis (Tyler 2017).

Practically, the basic tenets of CL (e.g., the principle of lexicon-grammar continuum, the centrality of meaning), as well as a wide range of concepts (e.g., construal, metaphor, metonymy, categorization, embodiment), generate an energetic body of CL-inspired work, providing interesting implications for language pedagogy. The core of the usefulness of CL for language pedagogy lies in the reduced arbitrariness that language learners need to deal with. CL shows that "languages are motivated and therefore explainable" (Littlemore 2009: 187). Furthermore, it offers explanations of linguistic motivation at various levels, ranging from form-form to form-meaning to meaning-meaning relationships (Boers & Lindstromberg 2006).

Despite increasing attention and a promising future, applied CL is still in its infancy (Pütz 2007). An immense amount of research is needed to fully explore the theoretical and practical potential of CL and its synergy with SLA. Many scholars have outlined important research agendas at the interface of CL and SLA (e.g., Ellis & Wulff 2015; Littlemore 2009; Robinson & Ellis 2008; Tyler 2012, 2017), among which a few items are particularly urgent. At the theoretical level, thorough empirical analysis of L2 language usage, especially situated language use within naturally occurring discourse, needs to be conducted longitudinally and cross-linguistically to further investigate the usage-based nature of SLA. At the practical level, the CL-inspired approach to L2 learning and teaching needs to move from theoretical discussions to classroom implementations. Various CL-based pedagogical suggestions need to be translated into teachable classroom materials and activities accessible to language instructors with no CL background. In order to investigate the effectiveness of such translations, future research needs to go "beyond the study of experimental and control group and short-term measurable gains," and "to combine qualitative and quantitative approaches to research, and to take a longitudinal perspective" (Littlemore 2009: 190).

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Related Topics

cognitive semantics; construction grammar and frame semantics; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; construal; cognitive linguistics and language pedagogy

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COGNITIVE LINGUISTICS AND DIGITAL LEXICOGRAPHY

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1. Introduction

Digital lexicography is a broad term that encompasses the early attempts at producing scanned machine-readable versions of printed dictionaries (Nesi 2012: 371), enclosing CDs with printed versions of dictionaries to enable automatic lookup and audio pronunciation options, and current online dictionaries, lexical resources and databases (Fellbaum 2014). Electronic tools and methods in digital lexicography are made available to lexicographers for the compilation of data and the synthesis of entries (Kilgarriff & Kosem 2012: 54).

Digital lexicography provides lexicographers with robust methods to highlight the context of keywords, visualize the lexico-syntactic behavior of a word in a single page (Bogaards 2013: 27), compile lexical resources, and describe and organize lexical units in a language resource (Fellbaum 2014: 378), among others. In addition, digital lexicography, as reflected in the online versions of the "Big Five" dictionaries, uses textual, pictorial, video, and audio media to provide easily browsable lexicographic information to users. The various digital displays, according to Peters and Fernadez (2018: 118), enhance the cognitive commitment of the dictionary users. Digital lexicography overcomes several challenges faced by traditional lexicography, such as the limited space of print dictionaries, the time and effort required to look up an entry or move from one entry to another, and the dilemma of cross-references (De Schryver et al. 2019: 665).

Parallel to the contribution of the digital tools to lexicography was the influence of Cognitive Linguistics (CL). CL has also contributed to lexicography and lexicographic practice. Addressing the cognitive abilities of dictionary users, Ostermann (2015: 1–2) argued that the use of cognitive linguistic theories in the field of lexicography would assist learners in encoding (production) and decoding (comprehension) tasks. She defined cognitive lexicography as "the application of a cognitive linguistic theory into the traditional lexicographic practice" (Ostermann 2015: 67). Although the field of lexicography was often considered to be practice, which does not stipulate the use of any theoretical background, Ostermann (2015: 47) proposed that more psychologically plausible descriptions of the language and better observance of cultural variation could be attained if CL was applied to lexicography. The application of a cognitive linguistic theory in lexicographic practice has resulted in the revision of incomplete entries in monolingual dictionaries, the addition of a new feature to a dictionary (Ostermann, 2015), the detection of mismatches in bilingual dictionaries (Atkins, Rundell, & Sato 2003), and, eventually, the creation of a new language resource (Baker, Fillmore, & Lowe 1998).

Nevertheless, the practical validity of cognitive linguistics as a relevant theoretical framework for lexicography is still debatable. Whereas Storjohann (2017: 108) maintained that cognitive linguistic theories are not influential in lexicographic practice, Halas (2016: 125) stated that cognitive linguistic aspects have been adopted in lexicography since 1998, and the *New Oxford Dictionary* was the first dictionary which abandoned the traditional methods of lexicography and embraced the cognitive approach.

Also, Fuertes-Olivera and Tarp (2011: 145, 157, 158) stressed the need for the application of a cognitive approach to pedagogical dictionaries in order to reduce the cognitive effort exerted by the users who have to gather the scattered pieces of lexicographic information from various dictionaries to build up a comprehensive picture. They reiterated the importance of adding encyclopedic cognitive knowledge to the definition of lexical units. At a minimum, basic concepts in a field, as well as their categorization, should be introduced in dictionaries. This is more attainable in digital lexicography than in traditional dictionaries because of the use of hyperlinks, the availability and possibility of integrating several lexicographic resources, the adequacy of storage space, and the immediacy of information retrieval.

Therefore, this chapter aims at (a) tracing the history of the interaction between CL and digital lexicography; (b) discussing the critical issues and common topics of interest to CL and lexicographic practice; (c) shedding light on the current research in this interdisciplinary field; (d) describing the effective methods adopted in previous attempts; and (e) recommending new directions for further research in this area.

2. Historical Perspectives

Although Ostermann (2015) was the first to dedicate an entire monograph to the systematic application of cognitive linguistic theories in lexicography, the intersection between CL and lexicography flourished in the 1990s. The availability of corpora and computer-assisted analyses guided lexicographers towards the digital era. Electronic dictionaries (including those CD-ROM-based editions that were popular in the 1990s) featured quick and flexible search engines that enabled users to find information within headwords and entries very quickly. In addition, users could benefit from audiovisual options absent in print dictionaries.

Published in 1993, *Longman Language Activator* (LLA) adopted a conceptual categorization of words according to the core concepts in English. LLA relied mainly on the computer-assisted analysis of corpus and used concepts to categorize words in groups. The dictionary compilers made explicit reference to "frames" as an essential basis for describing words. However, "frames", according to this dictionary's vision, were equivalent to the "grammatical patterns" in which words occur without reference to their cognitive schematic knowledge (Leech 1993: 10). Semantic fields or domains were the basis of this "psycholinguistic" categorization of words in order to construct a network of related concepts that can link *food*, *drink*, and *hungry*, for instance, to each other. Nerlich and Clarke (2000: 145) stated that the semantic fields approach and the approach of Frame Semantics group words into categories according to the similarity of the conceptual heading. The frame-based categorization is grounded in the schematic representation of meaning. However, the domain-based categorization is rooted in the paradigmatic and syntagmatic relations. Therefore, semantic fields capture only linguistic information, but frames capture cultural and contextual background information.

LLA aimed to help language learners in both decoding and encoding processes. It also had the traditional thesaurus feature of grouping synonyms in the same set. However, the conceptual field-based organization of the entire dictionary and the description of the grammatical contexts of words differentiate LLA from traditional thesauri (Scholfield 1993: 18). Consistent with the lexicographic norm in the early 1990s, a CD was enclosed with the print version of LLA.

The same conceptual categorization was partially adopted in *Longman's Idioms Dictionary* (1998), which allocated a section to the concept-based classification of idioms. ANGER, DIFFERENT, DIFFICULT, EASY, NOT UNDERSTAND, PROBLEM, SAME, START, STOP, and UNDERSTAND were the ten concepts under which several idioms were grouped. Glimpses of cognitive linguistics in the two dictionaries were present and, the compilers preferred to describe the conceptual categorization as psychologically motivated.

Later in 1998, the *New Oxford Dictionary of English* (NODE) proposed a cognitive-based representation of word senses according to their prototypicality. Many dictionaries benefited from corpus tools and opted for the frequency-based or chronological organization of word senses, but the results were not satisfactory. The oldest or the most frequent sense was not always the most intuitive sense accessible to native speakers. NODE followed a logical order of sorting senses (Lew 2013: 291). The compilers displayed what they considered the core or the dominant sense of a word first, and then secondary senses were listed. Technical uses, colloquial senses, and idiomatic meanings proceeded as peripheral senses, whereas archaic or obsolete senses were postponed to the end of the entry. Although this logical sense order would be of prime importance for pedagogical purposes, NODE was directed to native English speakers, and the wording of the definitions was less beneficial to non-native learners than the definitions offered in other learners' dictionaries (Grochocka 2008: 477). Similarly, *Oxford American College* (2005) followed the prototypical or logical order of word senses according to coreness.

Baker, Fillmore, and Lowe (1998) departed from the application of a single cognitive feature to a dictionary in CD format to the creation of a lexicographic database, which was entirely dependent on a cognitive linguistic theory and computer-assisted analysis. They initiated the FrameNet project, which was meant to be readable by humans and machines. This step moved beyond the pedagogical encoding and decoding purposes of lexicography. In addition to the traditional dictionary definitions of lexical units, FrameNet allocates each lexical unit to a frame (i.e., schematic representation of a situation) and identifies the frame elements (i.e., participants) in each frame. Unlike the traditional examples provided by dictionaries, the database provides annotated examples elaborating how the lexical unit is used along with its frame elements.

The first release of FrameNet contained the frames of 13 semantic fields only, whereas the current version hosts 1,224 frames and 13,676 lexical units. FrameNet has not been standardly employed in pedagogical contexts so far, but it is widely used in natural language processing tasks. FrameNet plays a significant role in lexicographic practice. Atkins, Rundell, and Sato (2003: 332, 338, 345) discussed several ways through which FrameNet helps lexicographers make decisions on sense separation and information inclusion in a dictionary entry. Comparing FrameNet's separation of polysemous senses to bilingual dictionaries highlighted mismatches in *Collins-Robert English-French Dictionary.* Moreover, this frame-based project can contribute to the differentiation between near-synonyms through the realization of non-core frame elements.

FrameNet differentiates between two instances of *kill* in terms of definition, frame, and frame elements. *Kill* means "cause to feel unsatisfied or unhappy" and evokes the frame of "Stimulate_ emotion". It occurs with "Stimulus", "Degree", and "Experiencer" frame elements. Annotated sentences like "It$_{[stimulus]}$ really$_{[degree]}$ KILLS me$_{[experiencer]}$ because they've been showing a lot of Baghdad on the news" instantiate this sense of *kill*. On the contrary, another sense of *kill* denotes "cause the death of" and belongs to the frame of "Killing". This sense appears with the participants "Killer", "Victim", which must be sentient, and "Instrument", among others. "She$_{[killer]}$ sees red and KILLS him$_{[victim]}$ with a very convenient weapon$_{[instrument]}$" exemplifies this sense.

The novelty of FrameNet at the cognitive and the computational lexicographic levels encouraged Dodge, Hong, Stickles, and David (2013) to introduce the MetaNet Wiki project. MetaNet integrates two of the most influential theories in cognitive linguistics, Frame Semantics and Conceptual Metaphor, in a single digital project. It is described as a tool for metaphor analysis that provides

valuable information about the frame to which a word's literal meaning belongs and the frame to which its conceptual metaphoric use belongs. The project links related metaphors to each other and lists their entailments. It also provides sample sentences instantiating conceptual metaphors in everyday language. MetaNet is more a digital cognitive project registering the conceptual metaphoric relations between words and frames than a cognitive lexicographic project listing the metaphoric meaning of words.

Aiming at a different lexicographic project based on Prototype Theory, Cinková and Hanks (2010) proposed the *Pattern Dictionary of English Verbs* (PDEV). The project is an implementation of Corpus Pattern Analysis, which links the meaning of the word to its use. PDEV records the patterns of verb usage in a corpus. It applies the principles of Prototype Theory to corpora to identify the conventional usage (norms) and the innovative usage (exploitation) of a verb. Therefore, a new prototype-based Theory of Norms and Exploitations is proposed. Verbs have frequent and rare patterns, and phrasal verbs are considered patterns of the base verbs. PDEV makes extensive and effective use of the digital methods available to lexicographers in extracting and classifying patterns of verbs. PDEV concluded four prototypical patterns of *hope* based on 7,733 frequency hits and 250 samples: (a) [[Human | Institution]] expects and desires {{that-CLAUSE} = Good} will happen or be done; (b) [[Human | Institution]] intends that, if circumstances permit, he/she, or it will do {[V] = Good}; (c) [[Human | Institution]] expects and desires that {{Eventuality = Good]] will happen or turn out to be the case; and (d) {I | we} expect and desire that {QUOTE}. In the same vein, Litkowski (2014) focused on the description of the syntagmatic patterns associated with a preposition, given that dictionaries only list the different senses of a preposition. Exploiting available digital lexicographic projects, the *Pattern Dictionary of English Prepositions* used data from Oxford English Corpora, The Preposition Project and FrameNet to describe the prototypical patterns of preposition usage, but it relies heavily on the FrameNet database.

Amid the lexicographic attempts to build databases on cognitive linguistic grounds, the "Big Five" dictionaries pursued the effort to add cognitive features to the dictionary entries. *Macmillan English Dictionary for Advanced Learners* (MEDAL), published in 2002, made a more salient application of cognitive linguistics in digital lexicography. In addition to the conventional use of computers and corpora, the dictionary was the first to include information about the conceptual metaphors underlying words (Yang 2015: 425). The dictionary realizes the significance of unveiling the conceptual metaphoric meaning of words used in everyday language in special "metaphor boxes". It even dedicates a section to discuss metaphors and conceptual metaphors so that the dictionary can increase learners' language awareness.

3. Critical Issues

3.1 Polysemy and Senses Separation

Lew (2013: 284) explained that *sense* in a language is the conceptual meaning as opposed to the referential meaning, which relates the word to the object it represents in the world. In dictionaries, a *sense* is defined as the "basic units of entry organization". The lexicographic approach to the representation of senses of polysemous words is based on either lumping or splitting. Lumping reduces the number of senses and increases the complexity of a sense to include multiple sub-senses, whereas splitting seeks a high level of fine granularity and lists as many senses as possible to account for each possible sense of the word (Lew 2013: 290). The lexicographic decision to lump or split senses is subject to "tradition, editorial policy and subjective decisions" (Toth 2008: 67). A major criticism that is leveled at this linear representation of senses is missing out on the comprehensive picture which links the senses to each other. Linear representation of senses cannot reflect the multidimensionality of the semantic structure of a word (Geeraerts 2001: 14–15).

From a cognitive perspective, Lakoff (1987: 5–12) postulated that the principles of categorization are applicable to polysemy. Prototypes and shared features among category members are mirrored in polysemous words. To elaborate, the several related meanings of the same word create a category whose members bear family resemblance. The prototypicality approach to sense representation acknowledges the blurred edges of categories, the cognitive weight of the prototype, the centrality of some members and the periphery of others, and it sometimes suggests a network representation that captures these features. Prototypicality has been ushered into computational studies in neural networks, fuzzy sets, rough sets, cluster analysis, latent semantic analysis, and lexicography, given its centrality to understanding the encoding and retrieval of conceptual information (Hahn & Chater 1998).

Geeraerts (1990: 49, 69, 199) proposed a prototype-based theory to deal with the challenges of polysemy and homonymy in dictionaries from a cognitive linguistic viewpoint. The proposal aimed at combining homonymic and polysemous senses of a word in the same network through the conceptual merger of the lexical substitution of a homonym. That is to say, homonymic items can be merged in a single polysemic complex. This reordering requires prototypicality clustering around the meanings that establish a link between the original concepts. The suggested display of this sense ordering was a graph-representation of polysemy. However, at that time, concerns about the available space in printed dictionaries were raised. In addition, if dictionaries choose to adopt prototypicality clustering of senses, the risk of overgeneralizing core senses may allow non-prototypical senses to be presented as core ones. Moreover, prototypical senses may be over-distinguished in a way that excludes senses which actually belong to the meanings of the polysemous word (Geeraerts 2001: 4).

Judging the coreness or the prototypicality of senses poses a challenge for lexicographers. Van der Meer (1999: 169) maintained that the core sense, which establishes a link between the different senses of a word, cannot be corpus-driven according to sense frequency. It should, rather, depend on the distinction between the literal and figurative senses of the word. The metaphoric approach to exploring sense representation enriches the awareness of dictionary users about meaning extension and transition from the literal to the figurative meaning. Therefore, the ideal dictionary entry should centralize the literal meaning and crystalize the relevance of other possible meanings to it. This outlook has redefined the scope of lexicographic relevance that was used to denote only diachronic knowledge in print dictionaries.

Parallel to the attempts to employ Prototype Theory in polysemy representation were the attempts to apply Frame Semantics. Boas (2001: 66, 71–72) applied the frame-based approach to the study of polysemous motion verbs in English and German. Frame Semantics described the predicate structure of motion verbs in the two languages and enabled the detection of schematic similarities and language-specific differences, which are vital to contrastive lexicography. The frame-based analysis explained how *run* and *walk* in English and *rennen* and *gehen* in German evoke the same frame of "Self_motion" as they occur within similar patterns: $NP_{[self_mover]}$ and $PP_{[goal]}$. Unlike *rennen*, *run* occurs within $NP_{[agent]}$ $NP_{[theme]}$ $PP_{[goal]}$ and, accordingly, evokes the "Cause_motion" frame. In German, it is *abdrängen* not *rennen* which can evoke "Cause_motion". Frame Semantics could relate the senses of polysemous words to each other. Therefore, frames, as microstructure elements, could replace the headword and the basic-sense approaches in building and organizing dictionaries.

In the same vein, Atkins and Rundell (2008: 131) advocated the use of Frame Semantics in sense separation. However, representing polysemy in dictionaries is controversial given the lack of clear-cut boundaries that separate word senses (Lew 2013: 287). Atkins and Bouillon (2006: 28–32) explained the effectiveness of the frame semantic methodology in the practical detection and separation of word senses. To elaborate, the valence patterns: "NP argue PP(with)" and "NP argue S.inf(that)" reflect two senses of the verb *argue*. The latter pattern belongs to the "Reasoning"

frame in which "Arguer" and "Content" are the core frame elements. The first pattern is observed in the "Quarrelling" frame in which "Arguer1" and "Arguer2" are the core frame elements. This method of sense separation is lexico-syntactically motivated. The frame semantic method is considered the "most helpful" and "appropriate" approach to studying a corpus (Atkins & Rundell 2008: 145).

3.2 Idiomatic Expressions and Metaphoric Meanings

Idiomatic expressions have several debatable definitions, taxonomies, and criteria of differentiating an idiomatic expression from other Multiple Word Expressions (MWEs). This section adopts the straightforward definition of Miller (2018: 359), which considers any MWE whose literal meaning is different from its figurative meaning idiomatic. This operational definition reflects almost the only point of consensus among lexicographers regarding idioms, which is their "degree of non-compositionality" (Moon 2015: 319).

Although lexicographers recognized the importance of studying idiomatic expressions many decades ago, dating back to Hornby's (1942) *Idiomatic and Syntactic English Dictionary*, growing interest in studying idiomatic expressions, at the lexicographic and cognitive levels, followed in the 1980s and 1990s. This remarkable effort was probably intensified and boosted by the influential role of corpora and the implementation of usage-based approaches that enriched the knowledge of MWEs (idioms, collocations, binomials, lexical bundles, phrasal verbs, and speech formulae). These advances were ventured towards learner corpus research, cognitive linguistics, and digital lexicography.

Digital tools facilitated the combination of different entries to display information about the senses, phrases, idioms, thesauri, semantic relations, and examples of a word collectively (Rundell 2012: 20; Miller 2018: 354). They also sidestepped all the trouble of lemmatizing an idiomatic expression and deciding about its headword. The lexicographer and the user do not face this challenge anymore because looking up any word from the idiomatic expression in an electronic dictionary would retrieve its senses and idiomatic uses (Miller 2018: 359–362; Jackson 2018: 543).

More importantly, digital tools and corpus-based metrics, such as length, frequency, and mutual information, provided information about variation in the usage of idioms (Hargraves 2018: 711; Horak & Rambousek 2018: 181). The semantic, syntactic, and morphological variation manifested in the behavior of idiomatic expressions suggested a scale of fixedness of the idiomatic expressions (Geyken 2015: 299). Moreover, variant patterns of associations succeeded in pointing to the polysemy of some idiomatic expressions, which were thought to have one sense in idiomatic dictionaries (Hümmer & Stathi 2006: 375).

Whereas corpus and electronic tools pointed at the variation and polysemy of idiomatic expressions, cognitive linguistic theories interpreted such discoveries. Before the 1980s, idiomatic expressions were hypothesized to be stored in the mental lexicon as constructions along with their meaning (Leroyer 2018: 258). However, the application of Conceptual Metaphor Theory (CMT) in the study of idioms expressing LOVE, ANGER, and PRIDE unveiled a set of conceptual metaphors underlying those idioms. Kövecses (1986) deduced that the successful mappings between the literal parts of an idiom and the source and target domains of the conceptual metaphor suggested a degree of compositionality of the idiomatic meaning. The idiomatic meanings of *blow off steam* and *slow burn*, for instance, can be traced back to the conceptual metaphor ANGER IS HEAT. The cause, duration, and intensity of the HEAT correspond to those of ANGER. Therefore, *blow off steam*, which reflects the release of suppressed or pressured heat (source), can be successfully mapped to the idiomatic meaning of releasing suppressed emotions of anger (target). Lakoff (1987) added that the meaning of many idioms is transparent in the sense that the visual image associated with the

idiom suffices to highlight the conceptual mapping between the composite parts of the idiom and the idiom's meaning. Therefore, the meaning of an idiom can be figured out because it depends on cognitive structures that are autonomously present.

This new conceptual metaphor approach to analyzing idioms demonstrated significant pedagogical implications. Yasuda (2010: 251) explained that idiomatic verb phrases impose a challenge to Japanese learners, not only because idiomatic verb phrases have non-transparent meaning but also due to the absence of this phenomenon in the Japanese mother tongue. Teaching Japanese ESL students orientational metaphors improved their performance in learning idiomatic verb phrases considerably. Similarly, Vasiljevic (2011) emphasized the effectiveness of categorizing idioms according to their inherent metaphors in enhancing the ability of Japanese ESL students to remember the meaning of the idiom for a longer time (Hung 2019).

Keysar and Bly (1999: 1563–1571) built a counter-argument proposing that mapping the literal parts of the idiom to the source and target domains of the supposedly underlying conceptual metaphor, although possible, can give rise to both the actual and the opposite meanings of the idiom, unlike the native speaker's intuition, which pertains to only a single meaning of an idiom. Cognitive linguists could reveal the conceptual structure underlying an idiom only because native speakers are already familiar with its meaning, but not because the conceptual structure independently exists. Keysar and Bly (1999) maintained that if the conceptual structure independently existed, native speakers would interpret the meanings of the idioms they are not familiar with through the cognitive application of the independent conceptual structures. The empirical support of this claim relied on the inability of native speakers to rely on a conceptual structure to interpret the two possible meanings of an idiom they were not familiar with. Moreover, native participants who were informed about the positive meaning of the idiom could not easily ideate the other negative meaning of the same idiom and vice versa.

Conceptual blending presented another cognitive interpretation of idiomatic meaning in view of the blending of various metaphorical patterns in a conceptual space to define the meaning of the idiom and relate these patterns to the composite parts of the idiom. This view covered several cases that had been uninterpretable within the scope of conceptual metaphors and explained the compositionality of idiomatic examples in which the conceptual mapping between the source and target domains is not obviously direct (Grady 2007: 201). Ramonda (2016) also added a cognitive interpretive feature of the meaning of idioms. The study integrated lexicographic and cognitive knowledge of idioms to explore and, thus, describe how native speakers move from the literal to the figurative meaning of the idiom. The study adopted a mixed-method approach that collected quantitative information from native judgments, analyzed qualitative statements of native speakers about their inference of the figurative meaning, and linked the experimental results to the etymological information available in dictionaries. Consistently, native speakers depended on shared encyclopedic world knowledge when they explained their inference of the figurative meaning from the literal parts of the idiom. The more transparent the idiom was judged to be, the less etymological information was offered by dictionaries.

4. Current Research

Prototype Theory (Geeraerts 1989), Frame Semantics (Fillmore & Baker 2011), and Conceptual Metaphor Theory (Lakoff & Johnson 1980) have been the most influential cognitive linguistic theories in lexicographic practice. Therefore, lexicographers applied them, whether individually or collectively, to support lexicographic efforts with cognitive aspects. This section will explore exemplary attempts that used cognitive linguistic principles to address a lexicographic challenge. Table 34.1 lists some of the studies that applied a cognitive linguistic theory or principle in the field of lexicography.

Table 34.1 Studies in cognitive digital lexicography

Author	*Year*	*Lexicographic practice*	*Cognitive linguistic theory/approach*	*Cognitive linguistic contribution to lexicography*
Gorbis	(2006)	Inclusion of the encyclopedic knowledge in definitions	Aspect Semantics	Cognitive dictionary based on the shared reality
Fuertes-Olivera & Velasco-Sacristan	(2012)	Bilingual entries of metaphoric terminologies	CMT	Translation considering conceptual and aesthetic purposes
Siqueira et al.	(2009)	Polysemy in terminological dictionaries	CMT	Revealing the polysemous (literal and figurative) senses of terminologies
Yelena & Natal'ya	(2015)	Defining metaphorical phrases	CMT	Exposing the metaphors which underlie the figurative eating-related vocabulary in Russian
Abdelzaher & Toth	(2020)	Definition and senses separation	FS	Revealing new senses of *crime*
Abdelzaher	(2017)	Definition of multidimensional concepts	FS	Frame-based definition and lexicon of *violence*
Dalpanagioti	(2018)	Lexical meaning and sense separation	FS and CMT	Building new dictionary entry for *stagger*
Dalpanagioti	(2018)	Phraseology and polysemy	FS and CMT	Frame-structured bilingual database of motion verbs
Dalpanagioti	(2019)	Polysemy	FS, CMT, and PT	New dictionary entry for *float* recording different senses
Xu & Lou	(2015)	Sense separation and definition of prepositions	Image Schema	New entry for *to* categorizing its spatial and non-spatial senses
Mheta	(2017)	Compilation of terminological dictionaries	Prototype Model of Cognitive Grammar	Prototypes underlie the new lexical units in Shona terminological dictionaries
Lu & Wei	(2019)	Polysemy	PT	Suggesting prototype-based graph representation of senses
Strojohann	(2017)	Polysemy and paronyms	PT	Integrating prototypical contexts in the description of paronyms
Halas	(2016)	Polysemy, sense separation, and sense definition	PT	Prototype-based modification of *drop* entry
Jiang & Chen	(2017)	Sense differentiation and ordering	PT	Prototype Theory offers a more effective approach to semantic extension
Molina	2008	Representing senses in historical dictionaries	PT	New prototype-based definitions capturing synchronic and diachronic aspects
Bagasheva	(2011)	Defining compound verbs in bilingual dictionaries	Schema Theory	Revealing the underlying similarities and differences between English and Bulgarian compound verbs which should be listed in dictionaries

CMT: Conceptual Metaphor Theory FS: Frame Semantics PT: Prototype Theory

4.1 Prototype Theory in Lexicographic Practice

Current research on the application of Prototype Theory (henceforth PT) in lexicographic practice reviewed sense sorting in dictionary entries, proposed ways to reorganize them, and integrated, to some extent, PT with other cognitive linguistic theories. Jiang and Chen (2017) implemented PT to explore sense ordering in selected definitions extracted from the "Big Five" dictionaries. They highlighted that dictionaries focus only on defining superordinate categories, without highlighting the category members. Moreover, word senses were not systematically organized. The use of prototypes to create definitions, centralize the prototypical sense, and identify the features of family resemblance was argued to be the best way to deliver the lexicographic information for learners in the most cognitively accessible way. This method would enhance the cognitive abilities of users to make accurate categorization and master the lexicon. The study suggested creating a hierarchical semantic network of senses to categorize senses based on prototypicality. In addition, it recommended the combination of PT with Image Schema and Frame Semantics in lexicographic practice.

Similarly, Lu and Wei (2019) advocated the integration of PT with Image Schema and Conceptual Metaphors. They referred to the ability of PT to fully account for the conceptual metaphoric senses and metonyms of a word. Moreover, it elaborates the extension from prototypical literal senses to metaphoric ones. They also acknowledged the role of PT in moderating the psychological debate over the appropriate processing of polysemy in the mental lexicon. Sense enumeration theory hypothesizes that each sense is represented separately in the mental lexicon, whereas one-representation theory argues that there is a single sense of polysemous expressions from which other senses emanate. PT enumerates all possible senses of a word, but it establishes links between them. It also opposes the syntactic constancy criterion, which is adopted in lexicography, for distinguishing polysemous senses from homonyms. PT maintains that senses belonging to different parts of speech should not be placed within different entries and links must be established among them.

At the methodological level, Storjohann (2017) proved the effective integration between PT and Corpus Pattern Analysis (CPA hereafter) in clearing up the confusing paronyms. Paronyms are easily confused word forms for native speakers and language learners, such as *sensibel* and *sensitiv* in German. Although structuring, describing, and writing dictionary entries of paronymic words could benefit from CL in revealing categories, concrete prototypes, and prototypical contexts of using each word, it has not been exploited. A cognitive-oriented description of paronyms should reveal categories, concrete prototypes, and prototypical contexts of using each word. This, in turn, requires CPA of the contexts of paronyms. This description informs native speakers and learners about their differences and educates dictionary users about the right context to use paronyms in. However, this requires the digital lexicographic display to enable users to choose the parameters according to which the contexts should be ordered.

Furthermore, Molina (2008) added a historical dimension to the application of PT in polysemy representation. She proposed a prototype-based model for diachronic dictionaries. She classified the citations listed of word senses in the *Oxford English Dictionary* (OED) according to their similarities and differences. The new similarity-based categories were incorporated in the definitions of the senses and organized chronologically. This attempt offered a new prototype-based taxonomy of the polysemous words, such as *pain.* Instead of centralizing "suffering" as the subsumer of all senses of *pain* in the OED, the revised definition separates "punishment", "emotional experience", and "emotional suffering" as three distinct senses. The number of quotations in each reading indicated the salience of the reading in Molina's model. The model traced polysemy and semantic change in the development of the senses. However, relying on the citations from the OED only cannot be reliable given that the criteria for inclusion and exclusion of senses were not declared, and the discontinuity of citations after the 19th century is a drawback.

4.2 Frame Semantics in Lexicographic Practice

Frame Semantics (FS hereafter) and its digital lexicographic project FrameNet have been widely employed in lexicography. Ostermann (2015) demonstrated the importance of including frame knowledge in dictionaries, which refer to some frame elements in the definitions without a comprehensive or systematic application of FS. She suggested replacing the sentences in the "Big Five" dictionaries with frame-based examples to enhance the acquisition and memorization of a word by language learners. A sample of English learners was divided into two groups to test the hypothesis. The target group read the entries with frame-based examples, whereas the control group read entries from the traditional "Big Five" dictionaries. The two groups completed translation and paraphrasing tasks based on the entries they read. On the one hand, no significant effect of the frame-example sections was observed in the translation tasks. On the other hand, participants in the target group showed more advanced performance than their counterparts in the paraphrasing tasks, and the exposure to frame knowledge was positively reflected.

Instead of adding a cognitive feature to a dictionary entry Abdelzaher (2017) used FrameNet to build a domain-specific lexicon of violence. The study proposed a cognition-based definition of violence and recorded violence-related frames and lexical units. Similar to the early attempts of Kövecses (1991) to compare the definitions of emotions in different fields, Abdelzaher (2017) compared the proposed cognitive definition of violence to the sociological and psychological ones. In addition to FrameNet, the study also used two lexicographic resources: WordNet and the Online Cambridge Smart Thesaurus section. Although the three resources adopt different categorization approaches (i.e., corpus frame-based in FrameNet, sense-based in WordNet, corpus-driven in Cambridge Smart Thesaurus), the proposed lexicon coordinated the results in frame-based entries. Frames were useful building blocks of the lexicon, and they allowed further classification of lexical units according to WordNet's synonymy sets. The possibility of using FrameNet with other language resources is comprehensively explored in computational linguistics.

Recently, Abdelzaher and Toth (2020) combined the use of the frame-based lexicographic relevance approach with the distribution-based processing of corpora in order to define *crime*. They conducted a frame-based analysis of the words which are distributionally similar to *crime* and compared them to words related to *crime* in FrameNet. The study made extensive use of digital lexicographic tools such as concordance, word sketches, and thesaurus and employed FrameNet's definitions of lexical units, frames, frame elements, and frame-to-frame relations. It suggested new senses of *crime*, which are present neither in FrameNet nor in dictionaries. Annotated examples are provided to elaborate each sense, and four frame-based and corpus-driven criteria are suggested to distinguish senses. Therefore, FrameNet is not only combinable with other language resources, but the FS approach is also integrable with other methodologies.

4.3 Conceptual Metaphor Theory in Lexicographic Practice

Lakoff and Johnson (1980) stated that metaphors are ways of thinking applied in everyday communications, not merely rhetorical tools. They analyzed a sample of the language used in daily communications and revealed a number of conceptual metaphoric structures underlying them. *Claims are indefensible*, *demolish argument* or *won an argument*, for instance, reflect the metaphoric understanding of the concept of ARGUMENT in terms of WAR. In lexicographic practice, Conceptual Metaphor Theory (CMT hereafter) was, first, employed to provide more accurate definitions of abstract concepts. Kövecses (1991) defined *happiness* through unveiling the conceptual metaphors and metonyms underlying happiness-related expressions in everyday language. He revealed the prototypical cognitive model, after which the definition of happiness should be structured. In addition to conceptual metaphors, metonyms and inherent concepts should be part of

the conceptual content of happiness. The prototypicality of *joy*, its causes, signs, and consequences, the attempts to control joy, the loss of control, and the actions involved in this scenario should be reflected in the definition of happiness (Kövecses 1991: 29, 40–41).

Ostermann (2015) made use of the comprehensive study of Kövecses (1991) to present cognitive-based definitions of emotions. She used FrameNet's definitions of basic and complex emotions, in addition to Kövecses's prototypical scenarios. She criticized the definitions in traditional dictionaries, except MEDAL, for lacking the cognitive aspects of emotions. Dictionaries use a strong, unpleasant feeling as a general superordinate in the definitions of basic emotions. Two groups of participants were asked to provide the name of the concept based on its provided definition to explore the validity of reflecting the cognitive content of emotions in the definitions. The control group was provided with traditional definitions of emotions cited from dictionaries, and the target group was offered cognitive-based definitions. There was a statistically significant difference between the correct answers given by the participants in the two groups. The target group performed better in the name-providing tasks as regards both basic and complex emotions. This reflects the effectiveness of including the cognitive aspects of emotions, in the definitions, in the comprehension of abstract concepts.

Dai, Wu, and Xu (2019) also studied the impact of using conceptual metaphor information, in the *Macmillan English-Chinese Dictionary for Advanced Learners* (MECD), on learning metaphoric collocations. At the cognitive level, they investigated the impact of explaining conceptual metaphoric information on the retention of metaphoric collocations. At the lexicographic level, they measured the time for lookup and retrieval of metaphoric collocations from MECD if compared to the *Oxford Advanced Learner's English-Chinese Dictionary* (OALECD) which lists metaphoric collocations according to their lexico-grammatical associations. Participants in the control group were provided with entries retrieved from OALECD. Therefore, the conceptual metaphoric information was neither available nor salient. The first target group was exposed to conceptual metaphoric information in the most salient way because conceptual metaphors were listed immediately after the headword and minimally seven sentences demonstrated the conceptual metaphors. The information about conceptual metaphors was available but less salient to the second target group; it was placed after the metaphoric sense and a single sentence exemplified it. The availability and salience of the cognitive information shortened the time for the lookup and retrieval of collocations and promoted the retention of metaphoric collocations.

Whereas CMT reasoned that metaphors pervade everyday language, figurative uses and, accordingly, metaphors were hypothesized to be absent from technical and scientific language. Siqueira et al. (2009) analyzed entries in a specialized dictionary of environmental law to detect the existence of metaphoric uses and polysemy. They detected several metaphoric uses of lexical units in the dictionary and unveiled the conceptual metaphors underlying them. They also proposed that the extension from literal to metaphoric meanings is one of the factors that motivate polysemy.

4.4 Combination of Cognitive Theories in Lexicographic Practice

Dalpanagioti (2018a, 2019) conducted a series of research combining FS and CMT in digital lexicography. Dalpanagioti (2018b) used FS to study the collocational patterns in the context of English and Greek motion verbs. He aimed at constructing a bilingual database of word senses and usage patterns for lexicographers. FS was used in sense differentiation and syntactic behavior description, whereas CMT and metonymy elaborated the motivations for sense separation (i.e., core, metaphoric, or metonymic meanings). The constructed database contained frame-based entries that were organized according to CMT. It is helpful to the lexicographer to build a frame-based dictionary, and it handles polysemy and phraseology. The metaphor/metonym section facilitates the identification of semantic extensions from literal senses to metaphoric ones in the traditional linear representation of senses. Although the study stated that the adopted literal-figurative representation

of polysemy is principled and cohesive, Principled Polysemy (Evans 2005) does not account for conceptual metaphors in determining the core "sanctioning sense" of a lexical unit. Similarly, the Graded Salience Hypothesis (Giora 2003) does not approve of the absolute salience of the literal sense over the figurative one in every context. On the contrary, the metaphoric sense is typically more salient than the literal interpretation in cases of conventional conceptual metaphors.

Mheta (2017) utilized both CMT and a prototype-based model to study metaphors in three terminological dictionaries in Shona. After the detection of conceptual metaphors in the dictionaries, a prototype-based model was used to describe the similarities between the concepts and identify the best example of each concept category. The three dictionaries were overwhelmed by concrete and abstract metaphors. The category of concrete metaphors was based on the symbolic cognitive relations between the source entity and the target entity. Animistic metaphors, which are subcategories of concrete metaphors that centralize human beings, are the best example of animals in Shona. The metonymic use of head was the basic category, while seeing, breathing, talking, and thinking were the attributes. Moreover, all the metaphoric meanings of *importance* included a reference to *head*.

5. Main Research Methods

On the one hand, lexicographic research does not follow a unified methodology and even if the same topic is addressed, diverse results are discovered. There is neither a comprehensive theory nor an approach, in lexicography, to contain the lexicographic research work (Bogaard 2013: 28). Cognitive linguistics, on the other hand, presupposes consensus principles governing the research work in the field. Therefore, Ostermann (2015) outlined the methodological steps which should be followed in the emerging cognitive lexicographic field.

At the pre-analysis stage, the identification of a traditional area of lexicographic research (e.g., the definition of senses, provision of elaborative examples, or categorization of lexical units) is the first step. This informs the decision on the most effective cognitive linguistic theory to address the selected lexicographic feature (Ostermann 2015: 205). In this regard, the use of CMT has proven useful in defining abstract concepts (Kövecses 1986, 1990), and FS was beneficial in defining multidisciplinary concepts (Abdelzaher 2017) and sense separation (Abdelzaher & Toth 2020). PT was most useful in discovering and representing polysemy (Halas 2016; Jiang & Chen 2017; Lu & Wei 2019). The final step in the pre-analysis stage is the selection of the linguistic data (e.g., semantic field, a single word, lexical units, or a grammatical class).

At the analysis stage, the chosen cognitive linguistic theory is applied to the selected data (Ostermann 2015: 205). In this regard, Steen (2002) proposed the Metaphor Identification Procedure (MIP) to detect metaphors systematically in a text. The MIP starts with dividing the text into clauses, converting them into a list of propositions and explicating omitted items (e.g., ellipses, substitution, null-instantiated arguments) in the pre-processing step. Then, the literal sense of the concepts should be identified. A comparison between the literal sense and the sense used in the text should initially inform the metaphoric and non-metaphoric classification of propositions. In the most notable cases, the difference between the domain of the literal meaning and that of the contextual meaning is the basis for this decision. The MIP is further discussed by Pragglejaz Group (2007). This type of analysis requires extensive in-depth qualitative analysis, in which corpus tools are not of enormous help.

Ruppenhofer et al. (2016) explained how the FS approach should be adopted to group words in the same frame or split them as evocative of different frames. Two lexical units should be placed within the same frame if their number and type of arguments are the same. The relation between the lexical units and their arguments should be identical, too. In addition, they must share the exact perspective of experiential knowledge and express related denotative meanings. If any of

the previous criteria are absent, the two words should be split in separate frames. Frame-based annotated sentences are essential to prove the fulfillment of these criteria. Corpus and digital lexicographic tools are vital to FS-based analysis.

The use of PT is the most challenging in lexicographic application because of the disagreement over what should be judged as the prototypical sense. The historical (Evans 2005), literal (Geeraerts 2001), or most frequent sense were debatably used as guides to identify the prototypical sense. Therefore, scholars supported the integration of PT with other cognitive linguistic theories, given its shortcomings and its effective integration with FS and CMT.

After the application of cognitive linguistic theory on the data, a new dictionary feature should be added. Comparing this final output to existing dictionary features is required at the evaluative stage to test the validity of the new feature. Notably, Ostermann (2015) did not only perform the comparison qualitatively, but she also conducted experiments among learners to check their performance after being exposed to traditional dictionary entries and to the newly added feature.

6. Recommendations for Future Practice

Whereas De Schryver recommends artificial intelligence as the future of lexicography (De Schryver et al., 2019), Ostermann (2015) nominates cognitive linguistic theories to be the next innovation in lexicographic practice. Although the application of cognitive linguistic theories to digital lexicography started in the 1990s and has resulted in the creation of new lexicographic resources and the addition of new dictionary features, cognitive lexicographic practice requires several improvements. Dąbrowska (2016: 480–481) argued that cognitive linguistic theories, especially Lakoff and Johnson's (1980) CMT, rely heavily on introspective analysis. Intuitive judgment and introspection do not suit the supposedly unbiased linguistic judgments and evaluations. It can be said that FS attempts to address this challenge by reliance on the lexico-syntactic environment of the target words to separate senses and group lexical units within the same frame. However, subjectivity cannot be totally eliminated given the manual annotation performed by FrameNet lexicographers.

In the same vein, Dąbrowska (2016: 482) referred to the cognitive commitment as an absent criterion in almost all cognitive linguistic theories and studies. Although cognitive linguistics is committed to the results and the discoveries of other disciplines in cognitive science, cognitive linguistic studies rarely refer to or propose converging evidence from other cognitive sciences. This makes cognitive linguistic results the least authentic and the least empirical in the cognitive fields.

Despite the irrelevance of these drawbacks to the field of lexicography, it is still possible to argue that digital lexicography would make better use of cognitive linguistic theories if they were more empirical, multidisciplinary, and authentic. The field of digital lexicography, in the era of big data and the internet, is seriously challenged by effective search engines and databases. Today's language learners prefer to search for a word they do not know instead of looking it up given the salient discrepancy between the information offered by a dictionary and that offered by a search engine. That is why prominent lexicographers such as De Schryver consider the Google search engine as the "best lexicographic resource" (De Schryver 2019: 671, 674). Moreover, he calls for a new dictionary type that moves beyond digital lexicography to "intelligent lexicography". Artificial intelligence should be able to exploit the dynamics of different lexicographic sources and retrieve user-customized results.

7. Conclusion

To conclude, attempts to apply cognitive linguistic theories and principles in lexicography can be traced to the 1990s. However, Ostermann (2015) proposed systematic and comprehensive principles

to implement FS, CMT, and PT in addressing lexicographic challenges. The use of PT and CMT in polysemy identification and representation in dictionaries gave innovative insights into cognitive digital lexicography. This holds true for the adoption of FS in senses separation and definition. Moreover, the three theories have proved to be effectively applied in the creation and structuring of lexicographic databases.

However, considerable methodological challenges face the current research given the different methods followed by each theory and the lexicographic dependence on the skills of expert lexicographers instead of the reliance on theory. Moreover, the failure of most cognitive linguistic studies to satisfy the cognitive commitment further complicates the matter. Therefore, adherence to empirical evidence and coordination between cognitive theories are recommended in further research.

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Lakoff, G. (2008). The neural theory of metaphor. In R. W. Gibbs (Ed.), *The Cambridge handbook of metaphor and thought* (pp. 17–38). Cambridge: Cambridge University Press. DOI: 10.1017/cbo9780511816802.003 (The neural theory of metaphor provides an explanatory mechanism for metaphorical inferences that can be modeled precisely using neural computational modeling to show how metaphorical understanding is grounded in basic human experience via primary conceptual metaphors.)

Related Topics

cognitive semantics; construction grammar and frame semantics; categorization; standard and extended conceptual metaphor theory

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COGNITIVE LINGUISTICS AND PHYTONYMIC LEXICON

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1. Introduction

Cogitology as a science about the human mind, intellect, mental processes, structure, and inner world has several trends, among which Maslova (Маслова 2017: 7) names cognitive psychology, cultural anthropology, artificial intelligence modeling, philosophy, neurosciences, linguistics, etc. The cognitive approach to language does not refute previous groundwork and I will try to prove this by presenting the results of my research, which deals with medicinal plants' (MP) names in Romance, Germanic, and Slavic languages. The stages of my research were structural-semantic and onomasiological analyses with their further cognitive interpretation.

The general stratification of the phytonymic lexicon, establishing motivated and unmotivated words, allowed me to reconstruct medical human activity, which is the cornerstone of modern scientific medicine. It is known that the results of the cognitive and classifying human activity find their expression in the system of designations, which can be direct and indirect. Naming an object, a person classifies it and assigns it to a certain class. The quantity of such classes is determined by a set of knowledge and ideas of the surrounding world. It means that the name of an MP (or a phytonym) can be presented as a cognitive model of human activity reflecting the sum of knowledge of the person not only about a concrete plant but also about the outside world during historical development. This activity is of universal character and is at the same time nationally specific. The onomasiological and cognitive analyses of phytonyms allowed me to establish what language forms represent this lexicon in the compared languages. Inasmuch as motivated language forms play a large role in this lexicon, the major focus was on them.

2. Current Contributions and Research

Cognitive science resulted from research undertaken by philosophers, psychologists, physiologists, mathematicians, and linguists whose purpose was to identify in what way the perception of information, its processing, storage, transformation, and structuring takes place. The purpose of cogitology that unites various areas of knowledge is the creation of a new theory of language based on "the assumption that human cognitive structures (perception, language, thinking, memory, action) are inseparably linked among themselves within one general task—the explanation of processes of assimilation, processing and transformation of knowledge, which define the essence of human mind" (Петров 1988: 40–41).

Cognitive linguistics (CL) appeared in the 1950s, thus we can make a sort of summation and specification of its achievements. It has many definitions: an umbrella term (Кубрякова 2004: 7), a science of the future (Маслова 2017: 4), a biologically oriented empiric science (Кравченко 2004: 52), and many others. However here I would like to mention the opinion of Dirk Geererts (2006: 2), who metaphorically speaks about CL as "an archipelago rather than an island", "a conglomerate of more or less extensive, more or less active centers of linguistic research that are closely knit together by a shared perspective, but that are not (yet) brought together under the common rule of a well-defined theory". Presenting "Cognitive linguistics. Basic reading", he speaks about 12 fundamental parts of this theoretical conglomerate—a tour of 12 central islands: cognitive grammar, grammatical construal, radial network, prototype theory, schematic network, conceptual metaphor, image schema, metonymy, mental spaces, frame semantics, construction grammar, and usage-based linguistics. Of course, each of these theories has its author and followers who further developed the most interesting ideas. Most of these 12 aspects of CL can be successfully used while working with a large lexico-semantic group, phytonymic lexicon in my case. As far as many representatives of these 12 schools are authors in this book, I want to describe others.

Rudakova in 2002 (Рудакова 2002: 22–23) put forward several of the most well known schools and the directions of the linguo-cognitive investigations. I expanded this list in 2010 (see Панасенко 2010: 134–135) and now I want to do the same once more. During this decade there appeared several new and very interesting publications; some studies joined the golden findings of CL. I want to pay tribute to outstanding scientists for their significant contributions to the development of cognitive science, which are still inspiring for young scholars, and add new names of young talented scholars:

1. All-conceptual approach of the Moscow school: Elena Belyayevskaya, Valery Demyankov, Revekka Frumkina, Yury Karaulov, Elena Kubryakova, Dmitry Likhachyov, Yury Stepanov, et al.
2. Psycholinguistic approach: Valery Belyanin, Ilya Gorelov, Alexandr Shakhnarovich, Yury Sorokin, Alexandra Zalevskaya, et al.
3. Prototypical approach to studying the cognitive aspects of language units: Nikolay Boldyrev, Tamara Fesenko, Elena Pozdnyakova, Anatoly Sharandin, et al.
4. Lexico-semantic approach in the research of the conceptual content of language units: Anatoliy Babushkin, Yuliya Davydyuk, Vera Goldberg, Ludmila Grishayeva, Vladimir Karasik, Zinaida Kharitonchik, Marina Pimenova, Zinaida Popova, Ganna Prihodko, Iosif Sternin, Olga Vorobyova, et al.
5. Discourse analysis: Yaroslava Gnezdilova, Ekaterina Golubkova, Olena Marina, Olena Morozova, Nataliya Petlyuchenko, Iryna Pinich, Victoria Samokhina, Iryna Shevchenko, L'ubov' Tsurikova, Marina Zheltukhina, et al.
6. Problems of knowledge representation (linguo-culturological approach): Valentina Maslova, Yury Stepanov, Veronika Teliya, Svitlana Volkova, Sergey Vorkachyov, Irina Zykova, et al.
7. Gender analysis of conceptual structures representation in consciousness: Olga Byessonova, Olena Goroshko, Alla Kirilina, Alla Martynyuk, Halyna Stashko, et al.

Papers written by these scholars cover the period from the 1970s up to 2019 and are mainly written in Slavic languages.

3. Essence of Phytonymic Lexicon

It should be noted that botanical terminology in many respects differs from other terminological systems. Any plant (a herb, a bush, a tree) has scientific, literary, and common names. I have not chosen casually as my object of research the literary and common names of herbs. Above all, plants

in general, and medicinal plants in particular, play a large role in the everyday lives of people. Further, this lexicon is connected with the culture of peoples and reflects features of national consciousness. To show this national originality and to describe its characteristics, I have carried out a comparative analysis of languages with different structures, which allowed me to find some features of the considered level and its representation in different lexical systems and also to describe the general principles of systematization and classification of language material.

How are medicinal plants (MPs) named? Why do some plants have many names and others only a few? The designation of MPs is a special kind of activity, as it stands between everyday and medical practice, so far as more names are given to those objects (plants) on which human activity is concentrated and which are of utilitarian interest. Giving names to the MPs, a person first of all sorts them from the general class of plants, then identifies them with plants or objects already known to them, being guided thus by their sensual personal experience. The MP name can be considered as the instruction: where this plant can be found, how it looks, when it blossoms, for what disease it is the most effective, and so forth.

Because I have a vast corpus of examples, I use definite principles in their presentation. While processing different plants' names I differentiate between botanical names (which I give in Latin), literary names, usually included in dictionaries and familiar to many people, like German lit. Gemeiner Spindelbaum */common spindle tree/*—European Spindle-tree (Euonymus europea L.), and common (folk) names. To show the difference between them I mark the examples with "lit." for literary names; the rest of the examples, which are in italics, are common ones. Each example is accompanied by its translation into English and by the scientific botanical name of the plant in round brackets, e.g., French *Capuce de moine* /monk's hood/—Aconite monkshood (Aconitum napellus L.), Polish lit. *Kulczyba wronie oko* /crow's eye/—Strychnine tree (Strychnos nux-vomica L.).

4. Main Research Methods, Results and Discussion

4.1 Structural-Semantic Analysis

The results of the structural-semantic analysis of MPs' names show that the main types of structural models of phytonyms are: simple, derived, compound, complex-compound words, many-component units, and phrases. This type of analysis not only gives the opportunity to allocate word-formation models, but also to identify productive vs. rare types of compound words and unique models typical of phytonymic lexicon.

The most productive ways of designating MPs are derivation and compounding; it explains the large number of derivative words in Slavic languages, and compound and complex compound words in Germanic languages (Panasenko 2012a: 218).

This type of lexical analysis was very popular in the 20th century. It has lost its attractiveness for linguists now. It occupies a minor part of my research. I use it for the purpose of clarifying in what structural models human knowledge is packaged and what volume of information is hidden in them.

4.2 Onomasiological Analysis

Thanks to the analysis of the onomasiological structure of phytonyms, we can specify the nominative potential of derivatives, compound words, and many-component units and also establish their semantic and onomasiological characteristic properties.

There is an opinion that the onomasiological model represents the basis of word formation logical modeling; it is a scheme which reflects the course of cognitive activity directed to the choice of necessary category according to the developed description (Плотникова 2006: 111). My research is based on the tertiary model of a derivative and compound word developed by Kubryakova (Кубрякова 1978), which includes onomasiological base, onomasiological feature, and onomasiological predicate, which further on will be simply called a base, a feature, and a predicate.

Now I would like to specify what bases and features can be found in the phytonymic lexicon. We can speak about a base zone and a feature zone. Formally, the zone of base is formed by suffixes and notional words, by exocentric composites and compound bases. Categorically, all the bases are divided into two groups. In the first place, names of plants include the genus-species relations and hypo-/hyperonymic relations that imply the used part of a plant (flower, leaf, root, etc.), or the botanical part of a plant (thorn, prickle, leaf, sprout, etc.). Secondly, in the designation of a plant such lexical classes as an artifact, a person, an entity, a feeling, etc. are included.

The feature zone of phytonym has also its structural and semantic particulars. A large layer of lexicon contains the features necessary for the identification and localization of an MP: **features of appearance** (color, size, plant's structure, form, etc.), **locatives, temporal** (blossoming time, the beginning and duration of blossoming), **evaluative** (evaluation proper, physical properties, addressee, functional target, efficiency of application, etc.), **features of alienate/inalienate possession, emotive-expressive features** (positive and negative emotions arising at contact with a plant) and **features of warning about dangerous properties of a plant**. All these features are attributed to the base by means of comparative, causative, temporal, and other predicates.

I want to give some examples. These are cases of direct designation: German *Kleine Gliedkraut* /small grass which has chains/—Common yarrow (Achillea millefolium L.)—here the base is the MP's used part (kraut—grass), to which with the help of the predicate 'smth. is like this' **features of size** and **plant's structure** are attributed; Slovak *Biely sliez* /white/—Common marshmallow (Althaea officinalis L.)—the base is the plant itself, to which a **feature of appearance (color)** is attributed.

These examples are numerous, but they are less interesting than those which were formed metaphorically, i.e., cases of indirect designation, e.g., French *Sourcil de Vénus* /an eyebrow of Venus/—Common yarrow /its young sprout/ (Achillea millefolium L.): here the base is a part of a body; this is the body of Venus who in Roman mythology is the goddess of beauty; to this base **a feature of inalienate possession** is attributed by the predicate of comparison. If we analyze the deep structure of this onomasiological model, we will see that we have a combination of the **features of appearance** (form) and **evaluative**—this part of the plant is very graceful and beautiful.

However, the use of the onomasiological approach does not explain how the MP's name is connected with the notions of human beings about the world surrounding them; the society in which they live and also the system of concepts within which they operate. To solve this task cognitive research is required; it lets us describe not only the features sufficient for the identification of an MP, but also the entire complex of knowledge about this MP, that is, word semantics and its evaluative components.

Onomasiological analysis, being a logical development of structural-semantic analysis, prepares the way for cognitive analysis of lexicon. Studies in the last century had structural-semantic or onomasiological analyses as the final point of their research. CL revealed, however, an opportunity of deeper generalizations of the obtained data from the cognitive point of view, i.e., on their role in the processes of world cognition. In this sense, onomasiological analysis, like word building, was a specific stage in the study of the formal and semantic properties of the studied lexicon preceding the stage of cognitive judgment.

There is good reason to believe that the motivation of the revealed bases and features is connected with human cognitive activity and corresponds to particular mini-fragments of a conceptual image of the world. MP's names act as the stock necessary for the formation of a naïve image of the world. To explain why the plant is named through other concepts, I have made cognitive interpretations of such classes, the examples of which are presented below.

4.3 Cognitive Analysis

If we speak about cognitive analysis, we must come back to the 12 fundamental parts of CL and the seven schools mentioned above. Each of them has its own well-constructed methods of research.

Cognitive analysis, which I used in working with the large corpus of phytonymic lexicon (more than 10,000 examples in nine languages, including Latin), is based and is closely connected with basic notions of CL: mental lexicon, language and conceptual image of the world, the processes of conceptualization and categorization, frame and conceptual modeling combined with Fillmore's semantic cases, etc., thus, covering the topics of prototype theory, conceptual metaphor, metonymy, and frame semantics. My research is also conducted within the all-conceptual approach of the Moscow school, Tambov school—prototypical approach to studying the cognitive aspects of language units, lexico-semantic approach, and cross-cultural approach.

Insofar as it is impossible to describe in detail all the data I have obtained, I will present only the most interesting aspects. Using numerous examples, I will illustrate the principles of CL: receiving information by different channels, ways of processing it (metaphor and metonymy), and stages of human cognitive activity. Such a complex approach gives the opportunity to explain the motivation of features dominant in this or that language.

4.3.1 Information Processing Channels in Phytonymic Lexicon

Information about the world comes via sensory and communication channels. However, the perception of the world by a person amounts not only to five perceptual modi, but also to the regularities of the language, which describes these modi. The basic information processing channels are vision, touch, smell, taste, and hearing. In my language material, they have various ratios.

I will now attempt to describe how knowledge gained by the channels of perception finds its expression in language in the form of nouns (subject names), that is bases, or in the form of names of attributives (emotional feature lexis), that is features. As mentioned above, categorically we have two groups of bases: naming plants and others. Now let us try to trace what interrelation there is between lexical classes of bases and features of perception modes, and what features, established thanks to onomasiological analysis, are received via visual, olfactory, tactile, taste, and acoustic channels, and which of these channels is the most important in the designation of MPs.

The priority position in all the languages under consideration is occupied by **vision**. Thanks to vision, we can describe such plant properties as **size** (large/small), **shape** (usual/unusual, resembling known object/known plant, connected with known phenomenon); **color** (monochromatic/color combinations; intensity—light/dark); **place of growing** (wood, field, mountain, sea); **time of blossoming**; **time of collection**, etc.

The motivation features received thanks to the visual channel find vivid reflection in the group of 'other' lexical bases. These are such features as **form** (presented by an artifact, parts of a body of an animal or a person, a substance, a person, a nature object, etc.); **color** (natural phenomenon, metal, substance, etc.); features of a **plant's structure** (state, parts of the body, area, feeling, character's property, etc.); **appearance proper** (entity, parts of the animal's body, animal, insect, artifact, etc.). Let us illustrate it with some examples. In a Ukrainian phytonym *Вовчі ягоди чорні* /wolf's berries black/—Deadly nightshade (Atropa belladonna L.), the lexical base is a plant's part /berries/, to which by the predicate 'smth. has smth.' features of **appearance** (black color) together with the features of **alienate possession** (wolf's berries) are attributed. The deep structure of this onomasiological model includes one more feature—**evaluation**. In Ukrainian folklore, a wolf has a negative assessment. Deadly nightshade is an extremely poisonous plant. Thus, we may also speak about **features of warning about the MP's dangerous properties**. Here we have a combination of different features, although sometimes only one property of a plant is intensified, as in the Russian phytonym *Солнечное золото* /sunny gold/—Dwarf everlast (Helichrysum arenarium (L.) Moench.). The lexical base is metal, which is a standard of the specific yellow color, to which a **feature of appearance** (color) is attributed.

Thanks to **smell** we can identify a plant's fragrance (presence/absence; pleasant/unpleasant). Smell is a very subjective perception modus. Identical smells can be pleasant or unpleasant to

different people. Sweet flag (Acorus calamus L.), for example, has different names in different languages: French lit. *Acore odorant* /fragrant/, common *Acore aromatique*; German *Ingwer* /ginger/; English *Pine root*, *Sweet cinnamon*; Russian *Вонючка* /smth. that stinks/, Polish *Tatarak wonny* /a plant with a pleasant smell/.

Taking into account **tactile attributes** offered by psychologists and linguists (Панасенко 2010; Рузин 1994; Lederman 1982; Panasenko 2012b), as well as the tactile features allocated by me in the phytonymic lexicon, it is possible to present tactile sensations reflected in the semantics of MPs' names in the following way: **quality of a surface**: rough, asperous (a quality of sheepskin); durable (standards—iron, steel, wood); smooth (silkiness); prickly, sharp, horn, wax surface; **fabric structure** (wool, thick flannelette, velvet, felt, cloth); **consistency**: springiness, elasticity, softness (fuzziness, fuzz, moss), hardness, caseous consistency; **temperature sensations**: cold; **sensation of moisture presence/absence**: dry, wet; **greasiness**; **stickiness**; as well as "smth. which is impossible to touch" (skin scratches, skin irritation after physical contact, cuts), and some others (Panasenko 2012b: 135).

Let us take the same MP—Common mullein (Verbascum thapsus L.), which has a specific ***fabric structure*** to its leaves, and see how these qualities are verbalized in different languages and where they are located in an onomasiological model. **Evaluative** features (plant's physical properties) are attributed to such a lexical base as a plant or plant's part; examples are German *Gemeines Wollkraut* /common wool grass/; English *Flannel leaf, Flannel plant, Velvet dock*; Russian *Суконник* /fabric structure—woolen cloth/; in the last example evaluative features are attributed to the formal base presented by a suffix -ник.

It should be noted that in the majority of languages there are two ways of **taste** designation: by means of adjectives of taste and by means of a reference object. Thanks to taste, we can find out if the plant or its part is bitter/sweet/sour/salty. Taste modus perception has many standards of different origin: **plants** with specific tastes—bitter (pepper, mustard, black radish, etc.), sour (sorrel, barberry, lemon, cranberry, etc.); foodstuffs with sweet taste (sugar, honey, etc.); foodstuffs with specific taste (bread, meat, cheese); drinks and beverages (milk, wine, tea). This perception modus can be reflected either in lexical bases when naming plants with specific standard tastes or in **evaluative features** (plant's physical properties), e.g., Russian *Заячий щавель* /hare's sorrel/—Wood sorrel (Oxalis acetosella L.); Slovak *Horká ďatelina* /bitter clover/—Meadow clover (Trifoliun pratense L.).

We have few examples connected with **hearing** because of the specificity of our language material, e.g.: Russian *Писклец* /пищать—to squeak/—Pheasant's eye (Adonis vernalis L.); *Щелкунец* /щелкать—to click/—Greater celandine (Chelidonium majus L.); Ukrainian *Грім-дерево* /thunder + tree/ –February daphne (Daphne mezereum L.); Czech *Piskačky* /pískat—to squeak + suff./—Sweet flag (Acorus calamus L.).

In many phytonyms, these channels are combined, e.g., French lit. *Petit muguet* /small Lily-of-the-valley/—Sweetscented bedstraw (Asperula odorata L.), a combination of vision (small size) with the phytogenous standard (Lily-of-the-valley).

4.3.2 Ways of Information Processing (Metaphor and Metonymy)

Metaphor, its varieties and approaches to its study. Metaphor can be considered through the prism of the relationship between linguistics and logic, philosophy and psychology, and finally, through cognitive positions. If earlier metaphor was traditionally defined as a stylistic trope or speech mechanism, in modern science it is perceived as a cognitive tool, as a key element of language categorization, thinking, and perception (Лапшина 1996: 185; Lakoff & Johnson 1980), a thinking tool (Ортега-и-Гассет 1990: 71), as the beginning of thought process (Арутюнова 1990: 15), as the cognitive process expressing and forming new concepts, or as an informative evolutionary process, which unites the brain, mind, and culture in creative language (MacCormac 1985).

As for the essence of metaphor, its typology and functions, it is possible to state that there is a huge number of works and investigations conducted by outstanding scholars, including Arutyunova, Black, Davidson, Johnson, Kövecses, Lakoff, Simpson, Shakhovsky, Sweetser, Teliya, Turner, Wen, and many others.

Selivanova (1999: 16–17) claims that the main problem with metaphor theory consists in the definition of the mechanism of its formation. Among numerous conceptions, she distinguishes the following: (1) interactionist in two versions: psycholinguistic (Richards) and logical (Black, Vianu); (2) associative (Searle); (3) tripartite mechanistic (Delamare); (4) conceptual and anthropocentric (Apter, Turango); (5) possible worlds (Jolles); (6) synergetic (Apter); (7) anthropometrical (Teliya).

Modern studies describing metaphor from cognitive positions allow the specification of the following types: associative metaphor, cognitive metaphor, conceptual metaphor, syncretic or synesthetic metaphor, among others.

One of the conditions of some types of metaphor emergence is the existence of the similarity of signs of two comparative objects. The number of obligatory elements of metaphorical shift fluctuates from two to four. Richards (1950), for example, allocates two members of metaphor, which he names "contents"—a tenor and a cover (image)—vehicle. According to Lazurenko (Лазуренко 1979: 14), metaphorical shift requires the presence of three obligatory elements: an initial object, naming object, common features for both objects, which is the basis of the relations of similarity between them.

Black (1962) considers that our attention can concentrate on the only word in which the source of metaphoricity is covered. This word he names metaphor focus, and its environment—a frame. Such an approach is most acceptable for my language material, because metaphorically formed phytonyms primarily represent multiword lexical units.

4.3.2.1 Metaphor in Phytonymic Lexicon

As I have already mentioned, a plant's properties are encoded not only in its onomasiological features in the structure of the tertiary model, but in bases as well. The number of lexical bases not connected with the plant varies from 10 in literary names up to 24 in common names, however in each language they are presented differently. It is necessary to mention frequent bases, such as artifacts (weapons, tools, house utensils, clothes and its details, etc.), people (queen, soldier, mother, etc.), animals (wild, domestic, birds, insects, mythical creatures, etc.), substances (blood, salt, acid, etc.), and many others. These bases show the reference of the designated object not only to a plant or its part, but to something else. It means that the designation of a plant was done by comparison with known concepts and objects, i.e., by the important way of designation—metaphorization.

In my language material, phytonyms with metaphoric designation form several groups: examples which denote a **plant's appearance**: appearance proper, peculiarities of a plant's structure, unusual form of a plant itself or its part; **locatives** and **temporal features**; **evaluative features** (evaluation proper, a plant's physical properties, useful properties, toxic properties, result of a plant's use, negative attitude to a plant connected with local traditions, addressee, functional target, efficiency of plant's use) (for detailed analysis see Панасенко 2019); **possessive features**; **emotive-expressive features** (positive and negative emotions resulting after direct contact with the MP); **features warning about MP's dangerous properties**. Thus, metaphoric words can be of concretizing, evaluative, and emotive-expressive character.

As in the languages under consideration there exist too many examples, I will limit them to several of the most interesting cases.

Plant's structure. Autumn crocus (Colchicum autumnale L.) has a part of its bulb on the surface of the ground and from time to time, it loses a part of its peel. Its English common name *Naked ladies* reflects the aristocratic custom to wear low-cut dresses. Its synonym *Son-before-the-father* results from its unusual growth cycle where the flower appears in the autumn with no leaves around

it and the leaves appear in the spring and die off in the summer (Robertson 2008: 11). Examples with the metaphoric designation of this plant can be found in many languages, like English *Naked boy* or Russian *Сын без отца* /son without father/. The German phytonym *Nackte Hure* /naked whore/ not only indicates the feature of the plant's structure, but also contains a strong negative component. Though the examples vary in different languages, their lexical base is identical—a human being (lady, son, boy, etc.).

Form. The most numerous examples are connected with metaphoric description of the unusual form of the plant itself and its parts: flower, seed, seed box, leaf, etc. Form is mainly connected with features of alienate/inalienate possession, but also with different artifacts; parts of the human body: Czech *Židova brada* /Jew's beard/ Cuckoopint (Arum maculatum L.); parts of the animal's body: *Jeleni róg* /deer's pricket/—Smooth sumac (Rhusglabra L.); various forms and shapes of different artifacts: French *Madriettes* /bar + dim. suff./—Aconite monkshood (Aconitum napellus L.).

Temporal features. German *Wachende Jungfrau* /a wakeful young woman/; Russian *Зимовник*, Ukrainian *Зимівник* /someone who spends the winter in a specific area, e.g., polar station/—Common autumn crocus (Colchicum automnale L.). This MP blossoms when other plants have a rest.

Evaluative features. Russian *Мать-королева ядов* /mother-queen of poisons/—Aconite monkshood (Aconitum napellus L.)—many poisonous MPs are used in medicine; mother-queen in any society is greatly respected, she has high social status; this example shows the extremely high evaluation of this plant's properties.

Features of warning about a plant's dangerous properties. English *Bad-man's oatmeal*—Poison hemlock (Conium maculatum L.); Russian *Виновник* /culprit/—Herb Paris (Paris quadrifolia L.).

4.3.2.2 Metonymy in Phytonymic Lexicon

The second important method of MPs' indirect designation is metonymy permitting the description of the whole by its typical part. Differences between metaphor and metonymy usually are established on the basis of the function carried out by them in the sentence. According to Arutyunova (Арутюнова 1990: 32), metaphor carries out the characterizing function in the sentence and is focused mainly on the predicate's position. Metonymy carries out the identifying function in the sentence and is focused on the position of the subject and other actants. Therefore, metaphor is primarily a shift in meaning; metonymy is a shift in reference (Panasenko 2016: 70–71).

Another point of view on the nature of metaphor and metonymy consists in the description of different types of processes which they carry out. We may consider creating images as the main function of metaphor. Metonymy has, first of all, a referential function. Serving for the designation of the part as the whole, it "allows us to focus more specifically on certain aspects of what is being referred to … Metonymic concepts (like THE PART FOR THE WHOLE) are part of the ordinary, everyday way we think and act as well as talk" (Lakoff & Johnson 1980: 37).

Despite the huge number of works on metaphor, it should be noted that metonymy was studied mainly on the material of one language. Some works have already become classical, some present the latest studies of young scientists (Bierwiaczonek 2013; Diaz-Vera 2014; Panther 2014; Panther & Radden 1999; Panther & Thornburg 2017).

Traditionally metonymy works by the contiguity (association) between two concepts, e.g., between a person's feature and the person themselves, between the clothes or objects which the person wears, between the person and between the instrument of work and work itself or its results. However, given properties of my language material are unusual. In MPs' names, metonymy is

based on association or a contiguity between a plant and its part, place of its growth, time of its flowering, the illness which it treats, etc., that is, based on the features of appearance, locatives, temporal and evaluative features. Let us illustrate this with some examples.

Medicinal plant's appearance

Appearance proper. Russian *Бородка* /beard + suff. -k/—Mountain arnica (Arnica montana L.)—the plant has a specific edging of a flower.

Peculiarities of plant's structure. German *Ungeduld* /impatience/—Touch-me-not balsam (Impatiens noli-tangere L.).

MP's part. A plant may be named by its most prominent part: French *Épine blanche* /white thorn/—Common hawthorn (Crataegus oxyacantha L.); German *Kirsche* /cherry/—Belladonna (Atropa bella-donna L.).

Plant's location

Plant's location can be considered as the ground of similarity on contiguity: German *Hede, Haid* /*contorted* barren/; Russian *Бор* /pine forest/—Common heather (Calluna vulgaris L. (Hull.).

Temporal features

Metonymy is used to mark **the season** of the plant's blossoming: French *Mai* /May/—Common hawthorn (Crataegus oxyacantha L.); Russian *Май* /May/—Dandelion (Taraxacum officinale Wigg.); Czech *Sasanka* /icicle/—Windflower (Anemone nemorosa L.)—this flower usually appears in early spring during thaw.

Evaluative features

Most metonymic examples have evaluative motivational features, connected with the sequences of direct contact with the MP or its internal use. I may state that this group of phytonyms is named by **the result** of the contact with it either by people or by animals. The result may be a very unpleasant state: German *Rausch* /intoxication, drunkenness/—Thornapple (Datura stramonium L.); Russian *Спячка* /lethargy/—Black henbane (Hyoscyamus niger L.); or even death: English *Death-of-man*—Water hemlock (Cicuta virosa L.).

Physical contact with the plant may lead to the cut: Russian *Порез* /cut/ Common yarrow (Achillea millefolium L.); or evoke positive emotions: Russian *Улыбушка* /smile + dimin. suff./—Wild pansy (Viola tricolor L.); Ukrainian *Смішки* /snickers/—Dwarf everlast (Helichrysum arenarium (L.) Moench.).

The MP can be named according to **the disease** it heals: Russian *Золотуха* /scrofula/, *Холера* /cholera/—Spiny cocklebur (Xanthium spinosum L.). Among other evaluative features, it is possible to single out **functional target (instrument)**: Ukrainian *Люльки* /pipes/—*Black henbane* (Hyoscyamus niger L.)—seeds of henbane are put in a pipe and are smoked for soothing toothache; **physical properties**: Russian *Суконце* /woolen cloth + dim. suff.—leaves' texture/—Common mullein (Verbascum thapsus L.). There are some interesting cases when the plant is named by the object of application: German *Bubeschenkel* /*contorted* laddie's knees/—spirit tincture of a plant is applied to the treatment of grazes and scratches/—European barberry (Berberis vulgaris L.).

It is necessary to say a few words about the structural models which are the cornerstone of metonymic transposition. First of all, there are a large number of simple words which were not the subject of my consideration from an onomasiological point of view (dream, cloth, pine forest /in

Russian it is бор/, berries, etc.). Then it is necessary to mention derivatives with the formal base (a suffix), to which a locative or an MP's part is attributed.

The bases for metaphorical shifts in MPs' names are **features of appearance** (mainly form) and **evaluative**. Metonymic shifts are less frequent than metaphorical; they characterize common and colloquial lexicon. The MP is named by its most prominent part, by the time it blossoms, by its toxic content, by the disease it treats, by the instrument in treatment, but most metonymic examples reflect the unpleasant consequences of direct contact with the MP: headache, dizziness, lethargy, death, etc.

4.3.3 Stages of Human Cognitive Activity

Cognitive experience in categorizing objects of surrounding reality finds its expression in language by means of information transfer. The results of my research show that in phytonyms' semantics information processing channels are vividly reflected as well as concomitant to them some stages of its processing, related to the perceptible stage of cognition. In my opinion, there are universal ways of accessing data, which can be considered as primary. **Primary information**, as the reference point of human cognitive activity, assumes a number of special procedures of analysis, the most important of which I consider the frame with definite number of slots (positions), to which names are given. To describe the plant thoroughly, it is necessary to know where it grows, the time and duration of its flowering, the used part, efficiency of treatment, and many other things.

A person receives primary information mainly by sight at some distance from the plant, which enables them to define the form, color, and size of the plant, and also time and flowering duration. In cases where the plant has a specific strong smell, the olfactory channel can become the basic source of its designation.

The second stage of human cognitive activity represents **information processing.** It concerns information received at a close distance or during direct contact with the plant and further use of it. In this case, visual and olfactory channels are involved. Processing of information supposes, foremost, a comparison of plants, implying the discovery of likeness in a due form, original appearance, features of structure, etc., with known objects or plants. Finally, the smell of the plant, its used part, useful and medical properties are identified as a whole. Direct contact with the plant activates tactile receptors; it allows defining such physical properties of the plant as the texture of the surface (roughness, smoothness, silkiness, and so forth), and the use of a medicinal plant internally enables the determination of its taste.

Information processing about a plant can be completed; however, it may be continued, because additional information is involved. If the association with the plant becomes more complicated and the plant itself is compared to an object which has cultural value, then human cognitive experience exceeds the limits of sensory perception and includes judgment of factors leading to the formation of specific cultural concepts. During information processing about a new medicinal plant, a person usually involves background knowledge, which is of **culturally specific value**. Actually, it is an aspect of the second stage of human cognitive activity, but as this information is very important for us, I mark it out as a separate stage, the third one, which is based not on the biologic life of the subject, but on the social one.

The fourth and last stage of human cognitive activity is the **final estimation** (useful plant's properties, its physical features, efficiency of its application, possibility of its use not only in medical purposes but also in everyday life, among others). This stage is both complicated and important, because on this basis a plant can be attributed to a certain class: medicinal, poisonous, edible, technical, etc.

Now let us take the names of one plant in different languages and specify the connection between the information processing channels and stages of human cognitive activity.

Common yarrow (Achillea millefolium L.)

I. Information about the plant received at some distance from it

Stage 1. Perceiving the primary information

Channel: vision

Plant's shape: Russian *Девичьи пупки* /maiden's small navels/.

Place of growth: German *Feldgarbe* /field sheaf/; Russian *Гречиха полевая /field buckwheat/*.

II. Information about the plant received at an average distance from it

Stage 1. Perceiving the primary information

Channel: vision

Color: English *Green arrow*; Russian *Белоголовник /*smth., which has white head/.

Size: Russian *Мелкая трава* /small grass/.

III. Information about the plant received at a short distance from it

Stage 2. Processing the primary information

Channels: vision, smell

Likeness with a known plant: English *Dog daisy*; Russian *Гречка* /buckwheat/.

Physical properties—presence of specific odor: French *Herbe à éternuer* /grass for sneezing/; Russian *Пахучая трава /*strong smelling grass/.

Used part: English *Blood wort*, *Carpenter's grass*.

Useful properties: German *Jungfraukraut* /grass of/for a young woman—when a woman regularly washes her face with an infusion of this herb, the skin becomes velvet/; Russian *Носочистка* /smth., which cleans out your nose/.

Medicinal properties: French *Herbe à la coupure* /grass for healing cuts/; German *Säugkraut* /grass for nursing mother/; English *Soldier's woundwort*.

IV. Information about the plant received by direct contact with it

Channels: touch, taste

***Physical properties of the plant—durability, roughness, smoothness, prickliness, ability to cause a cut, to keep moisture, specific taste**:* Russian *Серпорезник* /smth. (suff.) which cuts like a scythe/.

V. Involving background knowledge, which has culturally specific value

Stage 3. Involving background knowledge

German *Venusaugenbraunnen* /brown spots in Venus's eyes/, *Weißes Achillenkraut* /the white grass of Achilles/.

VI. Estimation (of useful properties, physical properties of the plant and efficiency of its use)

Stage 4. Final estimation

Russian *Всем травам мать* /mother to all herbs—the best/.

Summing up the results, I want to say that stages of cognitive activity are reflected in each of the considered languages in different ways. In the MPs' names the first stage, a combination of the first and second stages, and the second stage are the most important. Stage 3, i.e., the attraction of background knowledge, is vividly seen in French, German, Russian, and Ukrainian; it allows the fullest characterization of the medicinal and other useful properties of a plant, the opportunity for its application in medical and household purposes. The fourth stage of human cognitive activity provides the chance to generalize all the MP's properties and to make them available to people living in a certain region.

The culturological aspect is shown differently in the semantic structure of a phytonym. In certain cases, for the explanation of the motivational features which are the cornerstone of the MP's

designation, it is necessary to use special knowledge from various fields of science, culture, history, mythology, and so forth.

5. Conclusion

A cognitive approach to the term system "Medicinal plants" permitted the reconstruction of the stages of the cognitive and practical activities of the person, the principles of perception and categorization of the world. MPs' names give the chance to describe the language image of the world which is present in the speaker's consciousness and forms one's internal lexicon. Systematization of literary and common herbs' names in terms of CL gives the chance to establish which part of knowledge about the herb is reflected in its name and which features are taken as a principle of their designations in each of the considered languages. Such important features, Such important features are evaluative and features of a plant's appearance.

The starting point of human cognitive activity is obtaining the primary information via visual, tactile, olfactory, gustatory, and acoustic channels. To make a judgment of an object, you need to examine it, to touch it, and sometimes to taste it. One of the peculiar properties of our lexical material is the reflection of various channel combinations in the herb's name, with the undoubted priority of vision.

Revealed by me word-formation models show into what forms human knowledge is packed. Although it is not reflected in this publication, I should mention that from all the available forms of knowledge representation, the best for my language material is the frame, thanks to which we can visualize the various sensory perceptions of a person and bring them together in one hierarchical system of knowledge.

Metaphor and metonymy as ways of processing the obtained information are presented in my language material by a number of examples. The figurativeness of metaphorical words has a concretizing, emotive-evaluative, and pragmatic character.

Metonymic transposition is based on the association or contiguity between a plant and its part, time of blossoming and collecting, the name of a disease, the place of growth, and several other characteristics.

It looks perspective to introduce the technique of onomasiological and cognitive analysis into other lexico-semantic groups that, undoubtedly, will promote the identification of features of verbal and perceptual human activity.

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Wen, X., Kun, K., Kuang, F. (2014). Cognitive linguistics: Retrospect and prospect. *Cognitive Linguistic Studies, 1*(2)*,* 155–170. DOI: 10.1075/cogls.1.2.01wen (The scholars in a compressed way have produced a very informative analysis of the status quo of Cognitive Linguistics. They present groups of researchers;

describe textbooks, journals, series, and reference books which may be useful to readers; inform about associations and academic conferences. Analysis of research methods popular in CL will also attract your attention and will be useful for your own investigation.)

Related Topics

cognitive semantics; categorization; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; cognition in language and culture

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36

COGNITIVE LINGUISTICS AND PROVERBS

Sadia Belkhir

1. Introduction

This chapter surveys cognitive linguistics and explores its involvement in the study of proverbs. Emphasis is put on Conceptual Metaphor Theory (CMT)—starting from its early version (Lakoff & Johnson 1980; Lakoff & Turner 1989), and moving towards its more recent version, Cultural Cognitive Theory (Kövecses 2005). Proverbs have not been researched from a cross-cultural perspective within this theory. Therefore, this piece of research can be seen as a humble attempt to satisfy this lack by suggesting a cultural cognitive approach to the treatment of proverbs.

This contribution to the handbook might be of interest to students, teachers, and academics involved in research into the interaction between cognition and language. It is also aimed at anyone working in the areas of language studies, cognitive linguistics, translation studies, and applied linguistics with special interest in proverbs. It is furthermore aimed at university undergraduate students and graduate students conducting research to obtain MA or doctoral degrees in English linguistics, cognitive linguistics, and applied linguistics. It presents background for scholars investigating the specific research area of cognition and language from a cross-cultural perspective, and is hoped to be sufficiently pertinent to meet the needs of researchers in this field of investigation.

Cognitive linguistics is an approach to the study of language in relation to cognition (Croft & Cruse 2004; Ungerer & Schmid 2006). The term 'cognition' refers to 'the process by which knowledge and understanding is developed in the mind' (www.oxfordlearnersdictionaries.com/). It also means 'the use of conscious mental processes' (https://dictionary.cambridge.org/). The adjectival form 'cognitive' means 'connected with thinking or conscious mental processes' (ibid.). Cognitive psychologist Matlin (2005: 2) defined 'cognition' as a mental activity with various cognitive processes. In her view, cognition concerns the acquisition, storage, transformation, and use of knowledge, and includes a wide range of mental processes, namely, perception, memory, imagery, language, problem-solving, reasoning, and decision-making. She further described the cognitive approach as a theoretical stance that focuses mostly on people's knowledge and their mental processes.

Cognitive linguistics encompasses an array of fields of research, such as cognitive grammar (Langacker 2013, 2008, 1987), cognitive semantics concerned with metaphor, metonymy, and phraseology (Kövecses 2015, 2005, 2002; Gibbs 2008; Barcelona 2003; Orthony 1993; Lakoff & Turner 1989; Lakoff & Johnson 1980), and neurolinguistics interested in the brain's functioning in

figurative language—metaphor and metonymy—comprehension (Lakoff 2008). Considering language as a conceptual phenomenon is a requisite in cognitive linguistics (Taylor 2012). The contribution of cognitive linguistics to other linguistic areas of research is fully recognized. Indeed it has served such disciplines as applied linguistics (Pütz et al. 2001), second and foreign language teaching and learning (Belkhir 2020; Verspoor 2017; Holme 2012, 2009; Lantolf 2011; Segalowitz 2010; Littlemore 2009; Cameron & Low 1999; Skehan 1998), language acquisition (Pütz & Sicola 2010; Robinson & Ellis 2008; Achard & Niemeier 2004; Atkinson 2002), and translation studies (Schwieter & Ferreira 2017; Ghazala 2011).

The literature on cognitive linguistics acknowledges its empirical corpus-based nature (Taylor & Littlemore 2014). Although early work into metaphor produced by cognitive linguists (e.g., Lakoff & Turner 1989; Lakoff & Johnson 1980) was essentially based on fabricated sample utterances in line with Chomsky's paradigm, cognitive linguistics later saw a methodological swing that gave priority to naturally occurring data. This is to say that usage has become the premise of all cognitive linguistic oriented research (for further clarification of the notion of usage, see Steen 2007). Proverbs represent good instances of authentic data that one can appeal to in research within a purely cognitive linguistic framework. Proverbs are defined in contrast with idioms. A proverb is a complete sentence that is often metaphorical and used to convey some wisdom or accepted truth (Belkhir 2014).

2. Cognitive Linguistics: Emergence and Developments

For almost two decades, the behaviorist paradigm had dominated American psychology, focusing mainly on observable behavior, rejecting the contribution of mental processes in the study of language. Afterwards, the cognitive revolution redirected attention to human thought processes, thinking abilities, and reasoning. In the late 1950s, a view concerning the relationship between mind and language emerged. Chomsky's ideas emerging out of his mentalist theory in generative linguistics supplanted the behaviorist approach, and cognitivism, as a linguistic current, appeared. One of the main tenets of the generative theory was the existence of an innate mental capacity within all children that permitted them to acquire the grammar of a language. This innate capacity, which he called Language Acquisition Device (LAD), or Universal Grammar (UG), was believed to be located in the brain (Chomsky 2000).

Cognitive linguistics emerged in the late 1970s and early 1980s as a field of research mainly concerned with exploring and explaining the tight link between language and cognition (Wilson & Keil 1999: 134). Cognitive linguistics stood out from Chomskyan language acquisition philosophy and challenged generative linguistics. The idea of an existing LAD or UG in the human brain is refuted. The link between language and cognition is treated with special emphasis put on such aspects as comparison, categorization, pattern finding, and blending that are believed to 'operate across all areas of language and are the same as those involved in other areas of cognition' (Littlemore 2009: 2).

Prominent figures characterizing the cognitive linguistic approach include George Lakoff, Ronald W. Langacker, and Len Talmy. Their major interest was to deal with language as an instrument for organizing, processing, and conveying information. Linguistic structures were analyzed as manifestations of 'conceptual organizations, categorization principles, processing mechanisms, and experiential and environmental influences' (Geeraerts & Cuyckens 2007: 3). An experientialist approach is adopted in cognitive linguistics. The notion of experience is understood as

> the totality of human experience and everything that plays a role in it—the nature of our bodies, our genetically inherited capacities, our modes of physical functioning in the world, our social organization, etc. in short, it takes as essential much of what is seen as irrelevant in the objectivist account.
>
> *Lakoff 1987: 266*

Lakoff (1987) promoted experientialism and rejected objectivism, which dealt, as argued, with meaning irrespective of its cognitive nature. This perspective considered meaning to be obtained via a relation between mere symbols, i.e., words, to refer to elements that are part of the real or fictional world. He thus introduced the Embodiment Hypothesis based on experientialism. In this hypothesis, conceptual structure is claimed to be meaningful because it is embodied, 'that is, it arises from, and is tied to our pre-conceptual bodily experience' (Lakoff 1987: 267). Embodiment constitutes a major tenet within CMT in cognitive linguistics (Gibbs 2005). The theory has received too much attention among scholars since its emergence in 1980 after the publication of Lakoff and Johnson's *Metaphors We Live By*. This theory braved earlier views about thought as being mainly literal and advocated its metaphorical nature. Ever since, considerable amounts of research have been conducted on the link between cognition and language. However, CMT's reliance on embodiment has been subjected to criticism; as Deignan (2005: 22) objected, 'it is sometimes felt that the influence of physical experience on thought is overstressed and the influence of culture is underplayed in Conceptual Metaphor Theory'. This led to amendments within the theory via a shift to the inclusion of the cultural dimension (Kövecses 2005). Today, the interplay between cognition, language, and culture has become completely standard in cognitive linguistics.

3. CMT's Contribution to Proverb Study: Theoretical Issues

Proverb understanding has been researched within CMT (Lakoff 1993; Lakoff & Turner 1989), and a model for proverb interpretation has been suggested. This model is the Great Chain Metaphor model and its core component the GENERIC IS SPECIFIC metaphor whose function is to make one proverb refer to a wide range of situations. To illustrate this phenomenon, Lakoff and Turner (1989: 162) provided the example *blind blames the ditch*, which is understood as 'being not just about blind people but about a broader class of people, people who have some incapacity'.

Lakoff and Turner (1989: 162) introduced the generic-level type of conceptual metaphors to remedy the problem of proverb understanding. In their view, the GENERIC IS SPECIFIC is useful for the interpretation of proverbs:

> There exists a single generic-level metaphor, GENERIC IS SPECIFIC, which maps a single specific-level schema onto an indefinitely large number of parallel specific-level schemas that all have the same generic-level structure as the source-domain schema.

In other words, the GENERIC IS SPECIFIC metaphor is a tool used to interpret proverbs that are said to have one specific-level schema or structure. For instance, the proverb *barking dogs seldom bite* contains the specific-level concepts *barking, dogs, seldom, bite.* By means of the GENERIC IS SPECIFIC metaphor, this proverb is interpreted at a generic level. That is to say, *barking dogs* represent any persons who argue strongly and *seldom bite* refers to the harmlessness of the action of arguing. In this way, the generic meaning of the proverb can be obtained; it is: people that argue strongly will not harm you. This generic-level meaning having this generic structure will enable this proverb to be used in many situations that present a similar generic structure. For instance, it can be used when your boss complains strongly when you are late for work but dares not penalize you for that. This example illustrates how the GENERIC IS SPECIFIC metaphor allows the extraction of a generic meaning out of the specific-level structure of one proverb and then makes use of this generic meaning in many other cases having a similar generic structure.

Lakoff and Turner (1989: 172) described the GREAT CHAIN metaphor as a whole that allows proverb understanding through the comprehension of human features and behavior via analogy with animals and objects and vice versa. They claimed:

> The GREAT CHAIN metaphor is a tool of great power and scope. By linking the Great Chain with the GENERIC IS SPECIFIC metaphor, it allows us to comprehend general human character traits in terms of well-understood nonhuman attributes; and conversely it allows us to comprehend less well-understood aspects of the nature of animals and objects in terms of better-understood human characteristics.

The GREAT CHAIN metaphor is a cultural model appearing in two versions: the Basic and the Extended Great Chain. In the former version, beings and objects are ranked in a scale with, at the top, higher order beings having many physical and mental properties, and at the bottom, inanimate things characterized by few physical properties. The behavior of beings and objects, in the scale, is given as follows: 'higher animals act by instinct or conditioning, lower animals and plants by biological laws, and physical objects by physical law' (Lakoff & Turner 1989: 182). The extended version of the Great Chain has as a highest point the cosmos (God and the universe) followed by the society, then human beings. Society is understood metaphorically in terms of low-level forms of beings (ibid.: 204).

What makes the GREAT CHAIN metaphor appropriate for the interpretation of proverbs in Lakoff and Turner's view is that it includes four components working all at once. First, the *Maxim of Quantity* ensures that enough information, and no more, is supplied to allow comprehension. Second, the *Great Chain* organizes entities on a vertical scale. Third, the *Nature of Things* shows the relationship between the characteristics of the ranked entities and their behaviors in the Great Chain of Being. Fourth, the *GENERIC IS SPECIFIC* metaphor takes generic-level structure from specific-level schemas. In this way, it allows the understanding of an unlimited number of situations metaphorically with reference to only one given situation described in a proverb, as previously explained.

The aforementioned model proposed by Lakoff and Turner (1989) did not deal with proverbs from a cross-cultural cognitive perspective, and thus did not account for variations resulting from differences between languages and cultures, leading to issues in the interpretation of figurative meanings (Belkhir 2019, 2014). There was a sharp need for advanced research that would examine cross-cultural metaphor variation. To respond to this need, Kövecses (2005) introduced a Cultural Cognitive Theory that accounted for both universality and variation in metaphor, highlighting the question of variation within the components of metaphor, such as source and target domain concepts, conceptual mappings, among others. For instance, target domain concepts are found to be used in some languages but not in others. In addition, it can happen that a single target domain concept to correspond to two different source domain concepts used in two distinct languages. This case in point is illustrative of what Kövecses (2005: 70) described as cross-cultural alternative metaphors. He further claimed that conceptual mappings within metaphors are subject to cross-cultural variation, because of the influence of cultural aspects. '[M]appings characterizing particular conceptual metaphors […] can vary from culture to culture, and from subculture to subculture' (ibid.: 127).

4. Cognitive Approach to Cross-Cultural Metaphoric Variation within Proverbs

Proverbs are molded within cultural models. Their meaning is understood in relation to the social cultural contexts wherein they are used (Belkhir 2019). Metaphor is ubiquitous in everyday language and so are proverbs. As such, they represent interesting pieces of authentic language worth exploring from a cognitive cross-cultural perspective. The aforementioned cognitive linguists' claims about the central role played by the cultural dimension within the interplay between cognition and language in metaphoric variation will be illustrated through examples of source-target domain mappings within some animal-related proverbs from Kabyle, Arabic, French, and English in comparison and contrast. Proverb illustrations provided to sustain my argumentation in the

forthcoming paragraphs are extracted from some books and dictionaries of proverbs (At Mensur 2010; Nacib 2009; Manser 2007; Fergusson 2000; Ibrahim 1996; Montreynaud et al. 1993; Vigerie 1992; Abd-Essalam & Zaghlul 1988; Qatamish 1988b; Rey & Chantreau 1985; Haji & Al-Akhdar 1981; Wilson 1970). For practical reasons, Roman script is used to represent Arabic illustrations throughout the discussion.

An examination of mappings involved in the HUMAN BEHAVIOR IS ANIMAL BEHAVIOR conceptual metaphor within proverbs reveals variation in the conceptualization of HUMAN BEHAVIOR in terms of DOG BEHAVIOR. For instance, the same source concept BARKING is mapped onto different target concepts in four English, French, Arabic, and Kabyle dog proverbs, (1), (2), (3), and (4) below.

(1) A good dog barks not in vain.
(2) *On ne peut empêcher le chien d' aboyer ni le menteur de mentir.*
we not can prevent the dog from to-bark neither the liar from to-lie
'We prevent neither the dog from barking nor the liar from lying'.
(3) *kullu kalbin biba:bihi nabba:ḥun.*
every dog at-door-his barking
'Every dog barks at his own door'.
(4) *Yesseglaf wqjun teseɛa w tesɛin tikwal ɣef qarrus, tis miyya i bab-is.*
he-barks the-dog nine and ninety times on head-his the hundredth to master-his
'The dog barks ninety-nine times to protect himself and a hundredth's time to protect his master'.

This variation is schematized in Figure 36.1, which reveals that ADVICE, LYING, FALSE COURAGE, and SELFISHNESS are conceptualized in terms of the same source concept BARKING. This can be explained in terms of 'the scope of metaphor' meaning 'the set of target domains to which a particular source domain can apply' (Kövecses 2005: 72).

A further case that is worth examining is the use of the source domain concept HUNTING in English and French dog proverbs (5), (6), (7), (8), (9), and (10) below.

(5) The dog that hunts foulest, hits at most faults.
(6) Many dogs may easily worry one hare.
(7) The foremost dog catches the hare.
(8) *Bon chien chasse de race.*
good dog hunts of race
'A good dog hunts by nature'.
(9) *Il n'est chasse que de vieux chiens.*
it not is hunting only of old-PL dogs
'Only old dogs hunt well'.

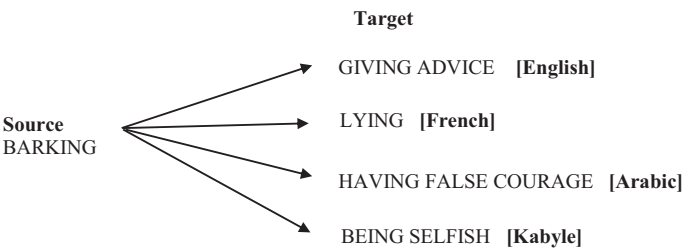


Figure 36.1 Mapping of BARKING onto different target concepts

(10) *Les chiens* *ne chassent* *pas* *ensembles.*
the dogs not hunt not together
'Dogs do not hunt together'.

Examples (5), (6), and (7) originated from a traditional cultural practice in Britain that used dogs such as greyhounds to hunt hares and participate in competitions wherein the dog that was foremost and caught the hare was the winner (Belkhir 2012). In these proverbs, HUNTING is mapped onto the following target concepts: BEHAVING BADLY, WORRYING A PERSON, and BEING THE FIRST. However, examples (8), (9), and (10) illustrate the use of the source concept HUNTING for other target concepts in French; i.e., INHERITING PARENTS' QUALITIES, EXPERIENCE, and DISAGREEMENT. Whereas there seem to be no proverbs involving the concept HUNTING in Arabic and Kabyle dog proverbs as is the case in English and French. These differences are likely culture-specific.

Variation is also observed in the use of the target concept HUMILIATION in animal-related conceptual mappings. This emotion concept is prominent in Arabic proverbs, as shown in examples (11), (12), (13), (14), (15), (16), and (17) below.

(11) *Huwa* *fi: mazjari* *'al-kalbi.*
he in niche the-dog
'He is in the dog's niche'.
(12) *'aṣbaru* *'ala:* *'al-hawni* *min kalbin.*
more-patient on the-humiliation than dog
'He is more patient in humiliation than a dog'.
(13) *Jawi'* *kalbaka* *yatba'ka*.
do-not-feed dog-your he-follows-you
'If you want your dog to follow you, do not feed him'.
(14) *'aḥabba* *'ahli* *'al-kalbi* *'ilayhi* *xa:niquhu.*
more-loved masters the-dog to-him strangler-him
'The dog loves a strangler better than his masters'.
(15) *Huwa* *'aḏallu* *min ḥima:rin muqayyadin.*
he more-humiliated than ass tied
'He is more humiliated than a tied ass'.
(16) *Fulan* *jamalu 'a-ssiqa:ya.*
he camel water-drawing
'He is a camel used for drawing water'.
(17) *Huwa* *'aḏallu* *min ba'i:ri* *saniya.*
he more-humiliated than camel water-drawing
'He is more humiliated than a water-drawing camel'.

In the four proverbs (11), (12), (13), and (14), HUMILIATION is mapped onto the DOG, in example (15) onto the ASS, and in proverbs (16) and (17) onto the CAMEL. The use of this target domain concept has a culturally based origin. Some Arabian tribes, as history attests, were more powerful than others were because of their wealth and the large number of male members they included. Other tribes were powerless and dominated by the powerful groups. The powerless suffered from excessive inequality and injustice practiced by the powerful (Qatamish 1988a: 318). This led to the emergence of a feeling of humiliation on the part of the powerless communities. Power and dominance created a tradition—when members of the powerful and the powerless tribes met at the water place/fountain, members of the powerful groups were the first to draw water and make their animals drink. Members of the powerless group were allowed to draw water and make their animals drink later. This cultural phenomenon is instantiated in camel proverbs conveying humiliation.

In Kabyle this emotion concept is not used in dog, ass, or camel proverbs, it rather manifests in one proverb on the monkey, as shown in example (18).

(18) *Ibeddel* *ṣṣifa am* *yiddew*.
he-changed face like the-monkey
'His face has changed like that of a monkey'.

In French and English, humiliation does not characterize animal-related proverbs. Therefore, no animal-related source domain concept is mapped onto the target concept HUMILIATION. According to Kövecses (2005: 70), "there can be differences in the range of conceptual metaphors (or, more precisely, the range of source domains) that languages and cultures have available for the conceptualization of particular target domains. This is what commonly happens in the case of emotion concepts as targets". This explanation seems to justify the incidence of this divergence in the use of HUMILIATION as a target within proverbs in English, French, Arabic, and Kabyle.

Further targets such as CUPIDITY and MISERLINESS are used for dog-related concepts in Arabic, but not in Kabyle, English, or French. These targets characterize mappings in Arabic dog proverbs (19), (20), (21), (22), (23), and (24) below.

(19) *Huwa 'abxalu* *min kalbin*.
he more-miserly than dog
'He is more miserly than a dog'.
(20) *Huwa* *'aḥraṣu* *min kalbin*.
he more-eager than dog
'He is more eager than a dog'.
(21) *Huwa* *'anhamu* *min* *kalbin.*
he more-insatiable than dog
'He is more insatiable than a dog'.
(22) *Huwa* *'ajša'u* *min* *kalbin*.
he more-greedy than dog
'He is more greedy than a dog'.
(23) *Huwa* *'abxalu* *min kalbin* *'ala" ji:fatin*
he more-miserly than dog on carcass-FEM
'He is more miserly than a dog on a carcass'.
(24) *Huwa 'abxalu* *min kalbin* *'ala:* *'irqin*.
he more-miserly than dog on meaty-bone
'He is more miserly than a dog on a meaty bone'.

This phenomenon can be interpreted in terms of cultural specificity. Qatamish (1988a: 322) draws attention to the fact that Arabs condemn such behaviors as cupidity and miserliness because of their considerable spread in Arabian society. In addition, the dog is conceptualized as a very greedy animal. This is the reason why these target concepts are overwhelmingly used in mappings within dog proverbs.

An examination of domain mappings involved in ass proverbs reveals cross-cultural variation. Asses' characteristic of being pack animals is used in Kabyle, French, and English, but seems absent in Arabic proverbs. For instance, source concepts BEING LADEN/CARRYING A BURDEN characterize mappings in proverbs (25), (26), (27), (28), (29), (30), and (31), below.

(25) An ass endures his burden, but not more than his burden
(26) An ass laden with gold climbs to the top of the castle

(27) The ass loaded with gold still eats thistles

(28) *Un âne chargé ne laisse pas de braire.*
an ass loaded not let not of brays
'A loaded ass won't bray'.

(29) *Tous les ânes ne portent pas sac.*
all the asses not carry not bag
'Not all asses carry a bag'.

(30) *Aɣyul n leḥbas ɛebbi w rkeb fellas.*
ass of community load and ride on-him
'The religious community's ass, you can load and ride it'.

(31) *Aɣyul menwala iɛebbi fellas.*
ass anyone he-load on-him
'Anyone can use the ass for loading'.

The source concepts ENDURING MORE THAN HIS BURDEN and BEING LADEN WITH GOLD are used in English proverbs (25), (26), and (27). BEING LADEN is used in French proverbs (28) and (29). BEING LADEN AND BEING RIDDEN characterize Kabyle proverbs (30) and (31). The source domain concepts BEING LADEN/CARRYING A BURDEN are absent in Arabic proverbs. An explanation that can be provided in this case is that speakers of English, French, and Kabyle make use of these source domain concepts because of the significant role that asses have in their sociocultural settings; i.e., being used as pack animals (Summers 2005; Montreynaud et al. 1993; Camps et al. 1988). Arabs on the contrary do not because camels are used to achieve this task more than asses are. They are in fact used for various purposes such as carrying burdens and being ridden in long travels (Qatamish 1988a: 406). This is what explains the absence of the BEING LADEN/CARRYING A BURDEN source concepts in Arabic ass proverbs.

Further culture-specific instances of mappings within ass-related proverbs are noticeable. There exist some source domain concepts relating to this animal that are specific to the ass proverbs of English, French, Arabic, and Kabyle distinctively. This can be seen in proverbs (32), (33), (34), and (35) below.

(32) Every ass thinks himself worthy to stand with the king's horses

(33) *Les ânes parlent Latin*
the asses speak Latin
'Asses speak Latin'.

(34) *La: ya'ba: 'al-kara:mata illa: ḥima:run*
not refuse hospitality-FEM only ass
'Only an ass refuses hospitality'.

(35) *I yezra Rebbi deg wɣyul yeksas acciwen.*
that he-knows Allah in the-ass he-removed-him horns
'The ass has been deprived of horns because of his nature'.

In English proverb (32), the source concept WORTHY TO STAND WITH THE KING'S HORSES is mapped onto the target concept EQUALITY OF THE GREAT AND THE LOWLY. This mapping is culturally bound because its use is due to the monarchy system characterizing Britain. Similarly, French proverb (33) emerged out of a sociocultural property of ancient France. This proverb involves the mapping of the source concept ASSES SPEAKING LATIN onto the target concept IGNORANCE because Latin was the language of French nobles, intellectuals, and educated people. In proverb (34), the target concept REFUSING HOSPITALITY is mapped onto the ASS because of the importance given to hospitality in the Arabian sociocultural context (Qatamish 1988a). In Kabyle example (35), the use of the specific

source domain concept DEPRIVED OF HORNS originated from a tale about an ass who thought he had horns and thus believed himself powerful. In sum, culture specificity characterizing the mappings involved in these four proverbs is influenced by particular English, French, Arabian, and Kabyle 'social history' that represents a significant factor that gives rise to differential experience leading to metaphor variation. This factor involves 'the major or minor events that occurred in the past of a society/culture, group, or individual' and is referred to as 'history memory' (Kövecses 2005: 241), which is conceived of as an unconsciously memorized construct shared by the members of social groups. This collective history is also believed to be coded in language. Contrasting social histories clarifies variations within conceptual metaphor and its components across languages and/or cultures, as demonstrated above.

Ox-related proverbs provide additional evidence of similar influences upon cross-cultural variations within conceptual mappings. The WISDOM and EXPERIENCE of the elderly are targets that are notably mapped onto the OX, in English, as shown in examples (36), (37), and (38) below.

(36) The ox when weariest treads surest.
(37) An old ox makes a straight furrow.
(38) An old ox will find a shelter for himself.

Proverb (37) has a French equivalent involving a similar mapping, as illustrated in example (39).

(39) *Vieux bœuf fait sillons droit.*
old ox make furrows straight
'An old ox makes straight furrows'.

The occurrence of these ox-related examples can be traced back to the social histories of Britain and France, particularly to the era that preceded the industrial revolution when oxen had a significant role in the economy. In Kabylie, oxen played an important role as well. They represented an important economic resource and a means of achieving prosperity (Nacib 2009: 93). Kabyle economic life depended mostly on agriculture before the advent of industrialization This fact had an influence upon Kabyle proverbs through the conceptualization of such abstract concepts as WORK, PRODUCTION, and ACHIEVEMENT in terms of ox features. Contrary to English ox proverbs that highlight the concepts of WISDOM and EXPERIENCE of the elderly, Kabyle proverbs emphasize the target concept of BROTHERHOOD, as shown in proverbs (40), (41), and (42) below.

(40) *Tagmatt hatt ɣer yezgaren, ɣer yiwen uzaglu a yeqqnen.*
Brothehood-FEM is to the-oxen to one yoke that yoked-they
'Brotherhood characterizes oxen, they are yoked in one yoke'.
(41) *A yazger anwi i d gmak? Yenna yas d win wid.*
Hey the-ox who that PART brother-your he-said to-him PART the-one with-PART
kerzaɣ.
plow-I
'Hey you ox, who is your brother? He said: the one whom I plough with'.
(42) *Azger yaɛqel gmas.*
ox he-recognizes brother-his
'The ox knows his brother'.

Brotherhood and solidarity have been highly characteristic of norms and values that have marked the social history of Kabylie. As such, they are part of the collective social memory of Kabyle people and thus are constantly encouraged (Nacib 2009: 60–64). This justifies the influences upon

the conceptual structuring of mappings in the above-mentioned ox proverbs (40), (41), and (42), wherein BROTHERS YOKED TOGETHER corresponds to SOLIDARITY and ALLIANCE, BROTHERS PLOWING TOGETHER to FRIENDS WORKING TOGETHER, and RECOGNIZING A BROTHER to KEEPING COMPANY WITH SOMEONE HAVING SIMILAR INTERESTS. Arabian social history has led to the existence of proverb (43) below.

(43) *tawru* *kila:bin* *fi:* *'ariha:ni* *'aq'adu.*
ox Kilab in the-race sitting-down
'Kila:b's ox is slow in the race'.

Example (43) is about a man called *Kila:b 'ibn Rabi:'a 'ibn 'amer* who pretended his ox was good for racing, but that was proved to be untrue (Ibrahim 1996: 141). This situation in Arabian social history has molded the conceptual structure of the mapping BEING SLOW IS INABILITY TO ACT within the proverb.

5. Future Directions

According to the above account of cognitive linguistics and proverbs, this section suggests some recommendations for further research to be conducted on proverbs under a cognitive linguistic perspective. More research is required to highlight the tight link between cognition, proverbs as naturally produced language, and culture. Such research would produce fruitful results if conducted on a large-scale, cross-cultural level. That is, the more languages are involved in the investigation, the more accurate and reliable the results will be. A culturally bound item within proverbs that would be pertinent to research is emotion concepts (e.g., humiliation, pride, anger, and so forth) and how these are mapped onto animal-related source domain concepts.

6. Conclusion

This chapter has surveyed cognitive linguistics and explored its involvement in the study of proverbs with a particular focus on CMT. It has stated some limitations of the early version of the theory and moved on to a description of the more recent version, Cultural Cognitive Theory, that accounted for the cultural dimension in the study of metaphor. Because proverbs represent authentic data that have not been researched from a cross-cultural perspective within this theory, this chapter has seized the opportunity to propose a cultural cognitive approach to the treatment of proverbs in order to satisfy this lack.

The examination of conceptual mappings characterizing the human behavior is animal behavior conceptual metaphor from a cross-cultural perspective has revealed divergences in the use of source and target domain concepts within English, French, Arabic, and Kabyle proverbs. These differences have been explained with reference to cultural influences upon conceptualizations of animals leading to culture-specific conceptual mappings across the proverbs in the four languages. This of course demonstrates the interaction between cultural models for animals and cultural contexts.

All in all, this modest piece of work can be hoped to have produced some pertinent data that might be of use to students and scholars interested in research into proverbs from a cognitive linguistic standpoint, and to have contributed to highlighting the importance of a cognitive cross-cultural approach when dealing with proverbs in cognitive linguistics. Nonetheless, further large-scale research is undoubtedly necessary for providing a comprehensive picture of cognitive linguistics and proverbs.

Further Reading

Belkhir, S. (2012). Variation in source and target domain mappings in English and Kabyle dog proverbs. In S. Kleinke, Z. Kövecses, A. Musolff, & V. Szelid (Eds.), *Cognition and culture: The role of metaphor and metonymy* (pp. 213–227). Budapest: Eötvös University Press. (This book chapter examines the variation of mappings within the human behavior is dog behavior metaphor in English and Kabyle proverbs and shows that remote cultural specificities result in far more differences than similarities across the languages. It furthermore explores the main meaning foci denoted in the proverbs and reveals differences in the extent to which they bear positive and/or negative connotations.)

Belkhir, S. (2014). Cultural influence on the use of DOG concepts in English and Kabyle proverbs. In A. Musolff, F. MacArthur, & G. Pagani (Eds.), *Metaphor and intercultural communication* (pp. 131–145). London: Bloomsbury. (This chapter investigates the cultural influences on the use of 'dog'/'*aqjun*' in English and Kabyle proverbs and explores the way dog behavior is used to represent human behavior and the kind of events and situations they are involved in.)

Belkhir, S. (2019). Animal-related concepts across languages and cultures from a cognitive linguistic perspective. *Cognitive Linguistic Studies*, *6*(2), 295–324. https://doi.org/10.1075/cogls.00042.bel (This journal article offers a cross-cultural cognitive study of some animal-related concepts used in a sample of English, French, Arabic, and Kabyle proverbs. It demonstrates the influence of cultural contexts and cultural models upon the main meaning foci characterizing the concepts DOG, LION, ASS, HORSE, CAMEL, and OX leading to varied hierarchical classification of animals on a scale.)

Belkhir, S. (Ed.). (2020). *Cognition and language learning*. Newcastle upon Tyne: Cambridge Scholars Publishing. (This volume explores the interplay between cognition and language learning and tackles such issues as cognition and skills development, language processing, vocabulary memorization, metaphor identification, vocabulary attrition, motivation, perception of phonemes, among others.)

Kövecses, Z. (2015). *Where metaphors come from. Reconsidering context in metaphor*. Oxford: Oxford University Press. (This book treats the issue of the influence of context on metaphor creation, perception, and use. It refines the principle within Cultural Cognitive Theory pertaining to the interaction between language and culture and shows that metaphorical meaning-making depends on physical, social, and mental environment.)

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Sharifian, F. (Ed.). (2015). *The Routledge handbook of language and culture.* Abingdon: Routledge. (This volume covers multidisciplinary language investigations into the link between language and culture. Its chapters draw on varied theoretical background in cognitive psychology, cognitive linguistics, and cognitive anthropology, among others.)

Related Topics

embodiment; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; culture in language and cognition

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PART IV

New Directions in Cognitive Linguistics



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37

COGNITIVE NEUROSCIENCE OF LANGUAGE

Rutvik H. Desai and Nicholas Riccardi

Abbreviations

IFG-Inferior frontal gyrus, SFG-Superior frontal gyrus, MFG-Middle frontal gyrus, PMC-Premotor cortex, STG-Superior temporal gyrus, prCG-Precentral gyrus, poCG-Postcentral gyrus, MTG-Middle temporal gyrus, ITG-Inferior temporal gyrus, AG-Angular gyrus, FG-Fusiform gyrus, MOG-Middle occipital gyrus, PHG-Parahippocampal gyrus, SMG-Supramarginal gyrus, CiG-Cingulate gyrus, RSC-Retrosplenial cortex, STS-Superior temporal sulcus, SFS-Superior frontal sulcus, ATL-Anterior temporal lobe, IPS-Intraparietal sulcus, IPL-Inferior parietal lobule, PFC-Prefrontal cortex, DM-Dorsomedial, VM-Ventromedial, LIFC-Left inferior frontal cortex, OTS-Occipitotemporal sulcus, OTC-Occipitotemporal cortex, ILF-Inferior longitudinal fasciculus, IFOF-Inferior fronto-occipital fasciculus, AF-Arcuate fasciculus, p (prefix)-Posterior, a (prefix)-Anterior, v (prefix)-Ventral, BA-Brodmann's area.

1. Introduction

The study of the neural basis of language is deeply intertwined with, and is indeed the driving force behind, the development of the fields of neuropsychology and cognitive neuroscience. The work of late 19th- and early 20th-century neurologists provided some of the first insights into language processing in the brain. They provided evidence that there is likely to be some level of specialization of function in brain regions. Studies of patients with language-related deficits, most famously by Paul Broca, Carl Wernicke, and Ludwig Lichtheim (Levelt 2013), and later extended by Norman Geschwind and others in the 1960s and 1970s, laid the foundations of the classic model of language processing.

In the 1860s, Broca reported two patients with severe speech production deficits. One patient was able to produce only a single syllable, *tan*, while the other produced five. Broca estimated that they had good language comprehension nonetheless. He examined the brains of these patients after their death and found lesions centered around the left pIFG (approximately pars opecularis and triangularis, or BA 44 and 45, but also extending into the white matter and surrounding areas), which came to be known as 'Broca's area'. In 1874, Wernicke reported a new type of language deficit.

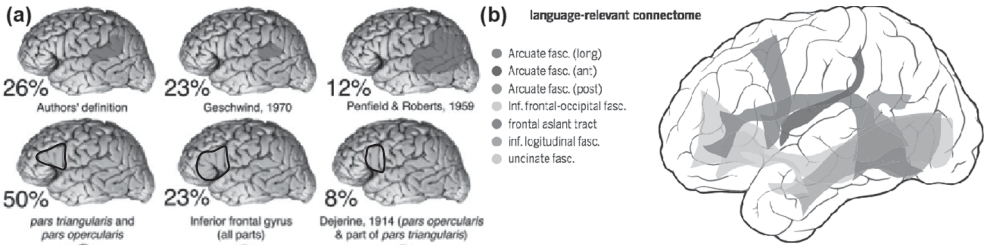


Figure 37.1 (a) Percentage of responders endorsing definitions of 'Wernicke's area' (top row) and 'Broca's area' (bottom row). The three most popular definitions are shown. (b) Major language-relevant white matter pathways. An important pathway not shown is the middle longitudinal fasciculus, which connects ATL and AG.

Source: (a) Adapted from Tremblay & Dick 2016. (b) Adapted from Hagoort 2019.

It was characterized by impaired speech comprehension, fluent but incoherent speech production, frequent phonological distortions, and defective repetition. Wernicke's original descriptions of the lesions described an extensive territory, including most of STG and MTG, and parts of SMG and AG. In spite of this, over time, the term 'Wernicke's area' became associated mainly with pSTG and surrounding cortex (Binder 2017). The extents of both of these areas have always been unclear, especially for Wernicke's area (Tremblay & Dick 2016). Figure 37.1a shows some of the more popular opinions regarding their locations.

Based on these findings, the classic model restricted language to these two main areas: Broca's area supported 'speech production', and Wernicke's area was thought to be responsible for 'speech comprehension'. The arcuate fasciculus connected these two frontal and temporal areas, which had a strict division of labor for speech production and comprehension. Research over the last three decades, using neuroimaging, lesion, and brain stimulation methods, has shown a more complex picture, rendering this model largely obsolete. Some of the limitations of this model are as follows. Studies have shown that language-related cortex is much more extensive, and includes the inferior parietal lobe, parts of the superior parietal lobe, large parts of the temporal lobe, and frontal lobe structures that extend beyond the pars opercularis and pars triangularis. Subcortical areas and cerebellum also play an important role in many language functions. The connectivity affecting language is much more extensive than the arcuate fasciculus, and includes multiple white matter pathways (Figure 37.1b). Language processing is also more bilateral than suggested by the classic model, which places language exclusively in the left hemisphere. Finally, the traditional Broca's and Wernicke's areas are ill-defined both anatomically and functionally. It is not simply that the boundaries of these areas are not agreed upon and therefore the terms are ambiguous (Tremblay & Dick 2016). These areas do not constitute coherent functional units. The concepts of Wernicke's and Broca's areas themselves, as speech comprehension and production 'centers', are not useful and confound multiple separate functions, as we will see in the sections below. Hence, many investigators now consider these concepts, and the use of these terms, to be outdated. It is more fruitful to use specific anatomical labels (e.g., LIFC, BA 44, pSTG) and discuss them with respect to functions such as phonological storage, lexical selection, and so on.

Here, we present a brief overview of some of the major facets of the neural basis of language, with a point of view informed primarily by neuroimaging and lesion studies. Among major omissions from this bird's-eye view are valuable insights from EEG studies related to time course of processing, as well as discussions of morphology, sign language, discourse processing, multilingualism, and language development, among other topics.

2. Aphasias

Aphasia is an acquired language deficit resulting from damage to the brain. Approximately 20–40% of all stroke survivors develop aphasia. Other brain injuries such as head trauma and tumors can also lead to this syndrome. The other major cause of aphasia is progressive neurodegenerative disease.

2.1 Classic Aphasias

Language deficits can be manifested in many different and complex ways. Several classifications or groups of symptoms (syndromes) have been proposed that attempt to reduce this complexity. The most popular classification of aphasias uses three key abilities: fluently producing speech, comprehending speech, and repeating words or phrases. Figure 37.2 shows the eight classic aphasias resulting from this method: nonfluent (also known as Broca's or expressive aphasia), fluent (also known as Wernicke's or receptive aphasia), conduction, anomic, transcortical motor, transcortical sensory, mixed transcortical, and global aphasia. While producing speech, common ways in which deficits manifest in patients are paraphasia and anomia. Paraphasia is substitution of a correct word with an incorrect word. The word can be incorrect in a number of ways, which can indicate the types of deficit a patient has. In phonemic paraphasia, an incorrect sound is substituted (e.g., saying 'tephelone' instead of 'telephone'). Semantic paraphasia is saying a word that is semantically but not phonologically related ('orange' instead of 'apple'). In neologistic paraphasia, an unrelated non-word is substituted ('japker' instead of 'shirt'). Anomia is the most common symptom of aphasia and is characterized by persistent word-finding difficulties. Patients often have an understanding of the concept they wish to express (e.g., they can demonstrate how a toothbrush is used with gestures

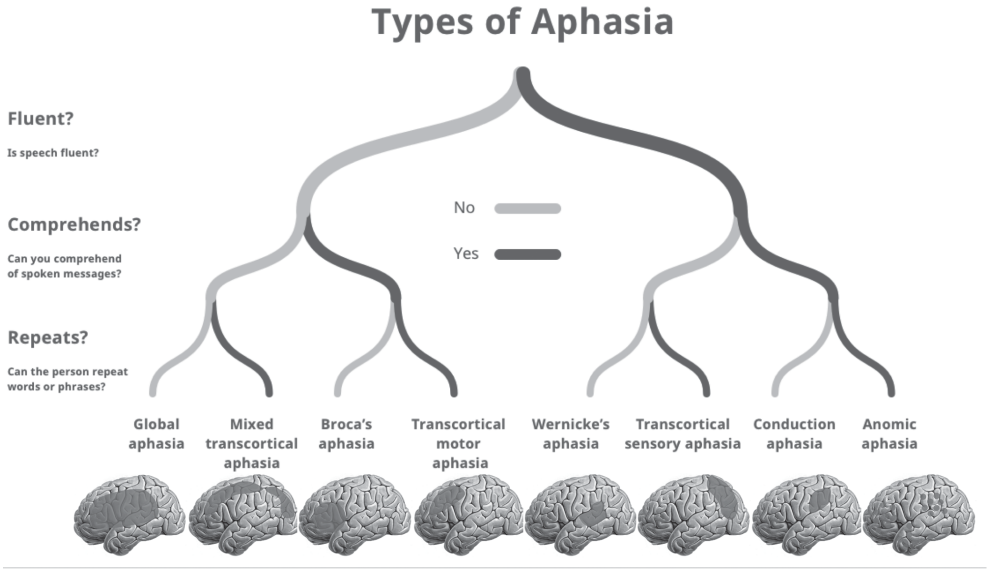


Figure 37.2 A classification of aphasias and associated lesion sites. The classification is based on three criteria: the ability to fluently produce speech, to comprehend speech, and to repeat words and phrases. 'Yes' indicates little or no impairment, 'No' indicates impairment. The lesion sites are 'typical' or commonly observed in group averages, but are neither necessary nor sufficient for producing the corresponding aphasia type.

Source: Image credit: www.aphasia.org.

or with verbal description) but are unable to retrieve the word itself ('toothbrush'). Reading impairment (alexia) and writing impairment (agraphia) also often (but not always) accompany these speech-related deficits in aphasia.

Common areas where lesions often lead to these syndromes are also shown in Figure 37.2. Note that these regions should be thought of as 'first approximations', and not as necessary and sufficient regions for producing the corresponding aphasia. There is often a great variability in lesion sites associated with each of the aphasias. For example, while pIFG is a region where lesions often lead to nonfluent aphasia, it is neither necessary nor sufficient. That is, there are patients with no damage to pIFG who are classified as nonfluent aphasics based on their symptoms. There are also examples of patients with damage in that region who do not have nonfluent aphasia. An additional caveat is that patients do not necessarily fall neatly into one of these syndromes. They often exhibit a mix of symptoms with varying levels of deficits in the three abilities, as opposed to the binary yes/no decision required for the classification. The levels of impairment can also change with time. Nonetheless, with these limitations in mind, this classification has been useful both clinically and for studying functional organization of language in the brain.

2.2 Primary Progressive Aphasia

When aphasia gradually arises as a result of neurodegenerative disease, it is termed primary progressive aphasia (PPA). Three main variants of PPA are commonly recognized: nonfluent or agrammatic (PPA-G), semantic (PPA-S), and logopenic (PPA-L) (Mesulam et al., 2014). PPA-G is characterized by nonfluent production with impairments in morphology, syntax, and phonology. Comprehension of words and simple phrases is relatively preserved, while repetition is impaired. In PPA-S (also known as semantic dementia), comprehension is impaired, production is fluent but has semantic errors, and repetition is intact. PPA-L is characterized by profound word-finding difficulties in production. Comprehension is mostly unaffected for words and simple sentences, but can be impaired for complex sentences. Repetition performance of these patients is inconsistent, but is often intact for words and short sentences while being impaired for long sentences and improbable word combinations.

Somewhat different regions of cortical atrophy are associated with each of the three variants. A word of caution is in order when associating specific brain regions with PPAs, similar to the caveat in the previous section. While damage due to stroke typically involves several regions and is not commonly circumscribed to a small region, atrophy due to neurodegenerative conditions tends to be even more widely distributed. Hence it is difficult, if not impossible, to associate relatively circumscribed regions (such as pIFG) with symptoms. Investigators often refer to areas of peak atrophy when discussing results. The actual areas of atrophy, however, tend to be widely distributed and are not limited to the peak regions. With this in mind, studies have suggested that atrophy in posterior IFG, MFG, SFG, PMC, and SMG is associated with PPA-G. Atrophy in the bilateral temporal lobe, especially in the anterior and middle sections, often extending into posterior sections both laterally and medially, is seen in PPA-S. In PPA-L, atrophy in occipitotemporal and temporoparietal regions, extending to middle and even anterior lateral temporal regions, as well as superior frontal regions, is seen (Mesulam et al. 2009; Wilson et al. 2010).

3. Semantic Memory

The goal of communication is to convey meaning. Different facets of language, such as syntax, phonology, and orthography, are useful only to the extent that they help convey meaning. Semantic memory (or interchangeably, 'conceptual knowledge') is one of the most defining human characteristics, and is essential to everyday life. It refers to our acquired knowledge about the world, including knowledge about objects, people, actions, relations, beliefs, facts, culture, society,

and meanings of words and phrases. This knowledge is thought to be abstracted over specific experiences or episodes. For example, your knowledge of what typically happens during a birthday party, what is a *cake*, *candle*, or the act of *blowing* a candle, is part of semantic memory. On the other hand, your recollection of what happened during a specific birthday party you attended is part of episodic memory. Episodic memory necessarily relies on semantic memory. When you recall how your friend failed to blow out the candles in that particular party you attended last month, you have to rely on your understanding of candles, blowing, friend, and so on. This brief review focuses on the neural basis of verbal concepts, or the representation of meanings of words and sentences. In the last 25 years, brain imaging, combined with lesion and stimulation methods, has provided a wealth of data on brain regions and networks involved in semantic memory.

3.1 General Semantics

3.1.1 Neuroimaging

Binder, Desai, Graves, and Conant (2009) meta-analyzed 120 neuroimaging studies that used linguistic input (words, sentences, or narratives) and used functional magnetic resonance imaging (fMRI) or positron emission tomography (PET) methods. They included areas activated by two broad types of contrasts: (1) high semantic vs. low semantic conditions, and (2) one semantic category vs. another semantic category. One example of the first type of contrast is a comparison of *cake* (real word) to *feip* (pseudoword). Another example is a task where subjects decide if *horse* and *sparrow* are both living things (living-nonliving judgment), vs. deciding whether *horse* and *force* rhyme (rhyme judgment). The former task emphasizes the semantic properties of the concepts (high semantic condition), while the latter task focuses attention on the phonological properties of the words, expected to result in lower levels of semantic activation. The second type of contrast, on the other hand, examines modulation of brain regions by the type or category of semantic content, such as tools or animals, relative to another category. An example is a contrast of a set of animal words (*horse, zebra*) to a set of tool words (*hammer, wrench*). The results are shown in Figure 37.3 (ignore the coding for now). Aggregated across concrete and abstract semantic

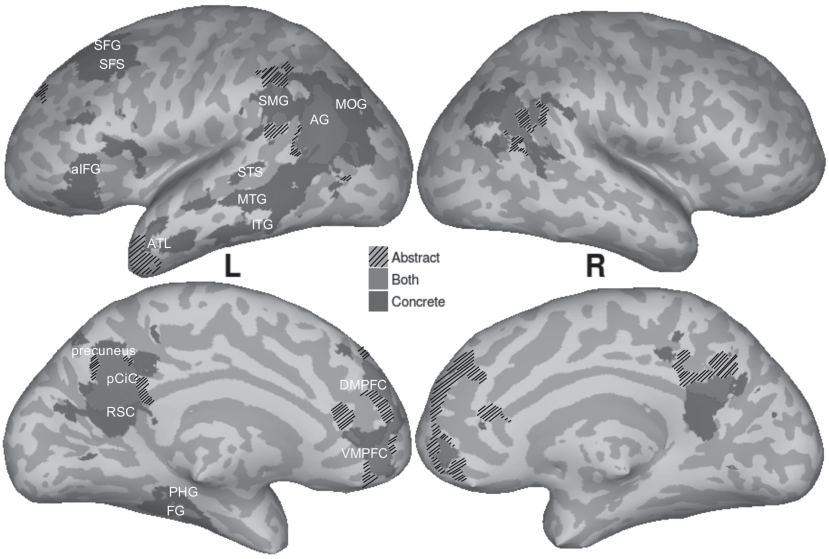


Figure 37.3 Areas involved in general semantics

Source: Based on the meta-analysis from Binder et al. 2009. Adapted from Desai et al. 2018.

categories, grammatical categories, and units (words, sentences, narratives), a distributed set of regions, implicated in semantic processing and storage, was activated. The main regions showing a consistent activation across studies were AG, SMG, MOG, STS, MTG, ITG, ATL, mid-FG, PHG, DMPFC and VMPFC, left SFG, SFS, anterior IFG, pCiG, RSC, and precuneus. Inferior parietal regions as well as medial regions were bilateral, while frontal and temporal regions were mainly left lateralized. This indicates highly distributed, bilateral system for general semantic content, with left-sided dominance. Because these regions are activated across conceptual content related to different sensory modalities, they are considered transmodal or multimodal regions, possibly with integrative functions.

3.1.2 Lesion Studies

Due to the highly distributed nature of semantics, identification of semantic regions from lesion studies is less clear. Transcortical sensory aphasia is a syndrome relevant to semantics because it is characterized by impaired speech comprehension, but intact repetition. It is associated with occipitotemporal and inferior parietal cortex, involving pMTG, pITG, and AG. This can be contrasted with conduction aphasia, with relatively preserved comprehension but disrupted repetition, caused by damage to SMG and pSTG. This dissociation between conduction and transcortical sensory aphasias suggests a phonological role of SMG/pSTG, and a semantic role of pMTG/pITG/AG. In contrast, some PPA studies implicate a different region, ATL, in semantics. The role of ATL is discussed below (see 'Putative Semantic Hubs'). In sum, lesion literature implicates both anterior and posterior temporal lobes, occipitotemporal cortex, and inferior parietal lobe in semantics. The precise role of these regions—whether they have a role in representation of semantic features, integration of features, or providing access to features—is less understood and remains an area of active investigation.

3.2 Embodiment of Concepts

The regions discussed above represent consistent activation over many different types of verbal concepts, and hence are important parts of the semantic system. It is important to note, however, that representation of concepts is not limited to these regions. An extensive body of research has demonstrated that modality-specific areas also represent concept features. 'Modality' here refers to the five senses (vision, hearing, touch, taste, and smell), as well as action. Additional sub-modalities can be added to this list, such as color perception and visual motion under the modality of vision. Brain regions that are primarily involved in processing input in one of these modalities are considered modality-specific, and are collectively referred to as 'sensory-motor', or more broadly, 'action-perception' systems of the brain. The core components of these systems are well known. For example, the calcarine sulcus and surrounding occipital lobe are crucial for vision. The middle part of the superior temporal lobe, including the mid-STG and STS, forms the auditory cortex. The central sulcus and surrounding regions contain the motor and sensory cortex.

The traditional view of concepts held that conceptual representations are abstract. That is, concept representations in the brain do not contain any modality-specific information. For example, the concept *banana* does not contain sensory-motor information such as shape, color, or taste represented in a modality-specific format. Instead, all our knowledge about bananas is coded in a symbolic way. Symbols are abstract in that the form of the symbol is completely arbitrary and has no relationship to what it represents. The symbol j34ps8 could represent the concept *banana* and c1q5v could represent *apple*. This view predicts a clear separation between the conceptual system and the action-perception system. However, there is now a large body of work, utilizing imaging, neuropsychological/lesion, and brain stimulation methods, that has provided evidence that action and perception systems are involved in representation and processing of concepts. This view falls

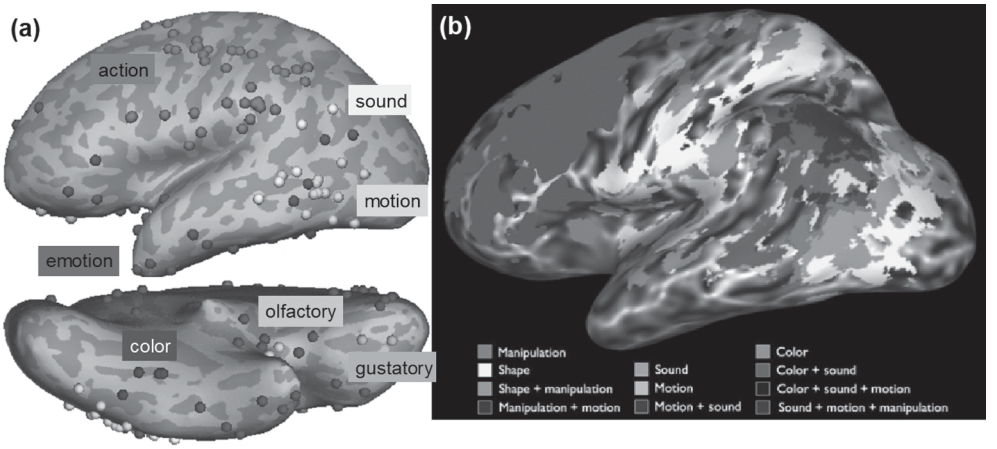


Figure 37.4 (a) Activation peaks from neuroimaging studies that use concepts that load heavily on a particular sensory-motor modality. All studies use linguistic stimuli (words or sentences) and are contrasted with other types of linguistic stimuli (e.g., abstract words). (b) Regions where BOLD activation was positively correlated with sensory-motor attributes of words while performing a semantic decision.
Source: (a) Adapted from Binder & Desai 2011. (b) Adapted from Fernandino et al. 2016.

under the framework of grounded or embodied cognition (Barsalou 2008; Kiefer & Pulvermuller 2012). Figure 37.4a shows activation peaks from imaging studies that examined concepts where features in a particular modality are important. All studies used words or sentences as stimuli. A pattern was observed across studies, where action concepts (e.g., action verbs such as *throw* or manipulable objects such as *hammer*) activated primary and higher-order motor cortex. Concepts with salient auditory features (e.g., *alarm* or *ambulance*) activated sound processing regions in the temporo-parietal cortex. Similarly, motion concepts activated areas in and near motion-processing complex MT+ at the occipitotemporal junction, and color concepts (e.g., verifying that bananas are typically yellow) activated color processing regions in the ventral temporal lobe. It appears that this pattern also generalizes to gustatory and olfactory concepts, although note that very few studies have examined these modalities so far. Another example is a study by Fernandino et al. (2016), who examined 900 nouns that varied in their sensory-motor features in five modalities: sound, color, motion, manipulation, and shape. Their results, shown in Figure 37.4b, again demonstrate modality-specific involvement of sensory-motor systems in lexical concept processing. These neuroimaging findings have been supplemented by numerous studies of patients with brain damage (e.g., stroke, Parkinson's) and brain stimulation (e.g., Transcranial Magnetic Stimulation). These studies show that when sensory-motor systems are damaged or stimulated, processing of corresponding concepts is selectively affected. This body of work suggests that rather than the conceptual system being abstract and separate from action-perception systems, it actually is at least partly based in them. In other words, representation of concepts is embodied by being reliant on bodily (perceptual and motor) systems of the brain. This view has not gone unchallenged (Mahon 2015), and there are examples of negative findings where patients with specific sensory-motor deficits do not show specific impairment for the corresponding type of concepts. While the mounting evidence from lesion, stimulation, and imaging methods has been increasingly difficult to deny, a debate continues regarding the precise nature of the involvement of action-perception systems in concept representation (Kemmerer 2015).

On the other side of the coin, the abstract symbolic theory has trouble explaining how a circular system containing only symbols connected to other symbols can represent conceptual content, without any 'grounding' of symbols in action or perception. In addition to the evidence for

embodiment, the lack of positive evidence for the existence of abstract symbols also puts the viability of the symbolic theory into question.

3.3 Categories of Concepts

3.3.1 Concrete vs. Abstract Concepts

Within the general semantic system, specific categories of concepts have also been found to show affinity for particular brain regions. Two broad categories can be distinguished in the form of concrete and abstract concepts. Concrete concepts can be defined as ones experienced through the five senses (*hammer, lake*), while abstract concepts are not related to these senses in any straightforward manner (*democracy, freedom*). Concrete concepts especially activate bilateral AG, PHG, precuneus, RSC, and pCiG as well as the left pITG and pFG relative to abstract concepts. Abstract concepts show sensitivity in the left dorsal ATL and IFG when directly contrasted with concrete concepts (Wang, Conder, Blitzer, & Shinkareva 2010). (Note that in Figure 37.3, IFG is activated from concrete concepts, but this is relative to control conditions such as nonwords and false fonts. IFG consistently shows an abstract > concrete pattern in direct comparisons.) This can be interpreted as consistent with the 'Dual Coding' theory (Paivio 2010). This view suggests that abstract concepts are represented through verbal associations (and hence are more left lateralized), while concrete concepts are represented through direct associations with percepts or image-based representations as well as through verbal associations. The alternative 'Context Availability' view (Schwanenflugel & Stowe 1989) suggests that abstract concepts depend significantly more on the contexts in which they occur, which are more diverse. Activation of left IFG for abstract concepts is also consistent with this view, given IFG's role in concept selection and integration. Involvement of dorsal ATL for abstract concepts is somewhat of a mystery. One explanation is that abstract concepts are typically more emotionally valenced (Kousta et al. 2011), and ATL is thought to have a special role in affective/emotional and social processing. However, this is not likely to be the full story, as parts of the ATL are activated by abstract concepts more than concrete ones even when controlling for emotional valence and arousal. ATL is strongly connected to pSTG/SMG implicated in phonology, which suggests another explanation in keeping with the Dual Coding theory, that abstract concepts have phonologically-based representations.

3.3.2 Living and Nonliving Things

Specific categories within the domain of concrete concepts, such as living things, nonliving things, tools, artifacts, and animals, have been examined extensively through neuroimaging and lesion studies. Behavioral dissociations in brain-damaged patients between living and non-living things have been reported, but anatomical localization of these categories has not been conclusive (Gerlach 2007; Giussani et al. 2011). Some level of localization for more specific categories has been found. Tool concepts, in line with the evidence discussed above, activate higher-order action areas in the left inferior and superior parietal lobe. In the temporal lobe, tools activate bilateral medial pFG, the left pMTG, and vPMC. Animals, on the other hand, activate bilateral LOC and lateral pFG (Chen, Lambon Ralph, & Rogers 2017). ATL is activated by both types of concepts. Lesion studies paint a roughly similar picture, where category-specific deficits for animal concepts are seen due to damage in the ventral temporal cortex, and tool-specific deficits are seen due to damage in pMTG, IPL, or vPMC.

It is worth emphasizing that the representation of categories such as living things, animals, or tools is not localized to a single area, but is distributed among multiple areas. Conversely, areas that contribute significantly towards their representation, such as the ones mentioned above, are not dedicated to just these categories, but also play other roles. The difference between animals

and tools is partly due to their differing reliance on sensory-motor features such as action, motion, shape, or color, but additional factors likely also come into play. It has been suggested that the number of shared vs. distinctive features is an important organizing principle at least in the ventral temporal lobe (Wright, Randall, Clarke, & Tyler 2015). The lateral pFG is found to respond more to animals possibly because they tend to have many shared features (such as having four legs, a tail, eyes, teeth, etc.) and thus form a more tightly intercorrelated network. Tools activate medial pFG more because they tend to have more distinctive and fewer shared features.

3.3.3 Categories of Abstract Concepts

Traditionally, abstract concepts have been treated as a single monolithic category, and were primarily defined negatively, as concepts that are *not* concrete. Abstract concepts present a special challenge for the embodiment view, given that they have no straightforward relationship to action and perception. Some theorists suggest that abstract words (and even concrete words to some extent) can be represented through statistically learned verbal associations (Andrews, Vigliocco, & Vinson 2009; Dove, 2014), minimizing the importance of variation in content within this category. This idea is similar in spirit to the Dual Coding view mentioned above. In recent years, interest in subcategories of abstract concepts and their differing content has increased. Some theories suggest that abstract concepts are grounded just like concrete concepts, but not through action-perception systems. Their grounding is in other systems of the brain, such as affective systems, magnitude processing, interoception (sensory perception of internal body states), metacognition (reflection on one's own mental processes), and event and situation schemas, depending on their content (Desai, Reilly, & Van Dam 2018; Borghi et al. 2019). In a meta-analysis of four types of abstract concepts (emotion, numbers, morality, and theory of mind), Desai et al. (2018) found significant differences as well as common regions across these subcategories, highlighting the heterogeneity within abstract concepts. Moreover, emotion words activated affective systems of the brain. Number concepts activated areas in the IPS associated with magnitude processing and finger representations. Regions salient for episodic memory and event schemas were activated for morality and theory of mind processing. Such results provide hints as to how different types of abstract concepts may be represented and grounded.

Finally, an influential view on how abstract concepts are understood is the Conceptual Metaphor Theory and its neural instantiation (Lakoff 2009). In this view, metaphors are not just linguistic devices, but provide a structure to the conceptual system. Abstract concepts are understood in an embodied manner through metaphorical mappings to sensory-motor systems. A conceptual metaphor is a projection of the basic experiential structure from concrete domains of experience (e.g., action, spatial orientation, movement) to abstract domains (e.g., mental processes, morality, mathematics). For example, the abstract concept of *understanding* something can be based on the action of *grasping* an object (e.g., grasping an idea). A number of neuroimaging and brain stimulation studies have provided evidence that action metaphors such as 'grasp an idea' activate higher-order action planning and execution areas such as aIPL, and are indeed grounded in action-perception systems (e.g., Desai et al. 2013). These findings have been extended to other domains such as texture, body parts, time, space, and motion-related metaphors. To what extent the conceptual system uses metaphors when they are not explicitly used, and how abstract concepts can be understood in those instances, remains controversial. Understanding and refining the neural basis of varieties of abstract concepts is likely to be one of the active fields of investigation in the near future.

3.4 Putative Semantic Hubs

Some regions of the brain show consistent activation for semantic processing of a wide variety of concepts, leading to proposals of semantic hubs. These proposals are motivated by the fact that

conceptual features are distributed and not always experienced simultaneously. The raw sensory features of different members of a category can also be very different (e.g., a tricycle and a train are both vehicles but have many differences). There is a sense that features need to be integrated, reshaped, and perhaps abstracted above, in a single anatomical location to form a coherent concept. Note that while the notion of a single anatomical location where 'everything comes together' is intuitively appealing, it is not a logical necessity. Integration and recombination of features can occur in a distributed fashion through synchrony between different areas. Nonetheless, several regions have emerged as potential semantic hubs. In the Fernandino et al. (2016) study mentioned above, five areas showed increasing activation to reliance on any of the five features, and thus are good candidates for integrative hubs: AG, pCiG, PHG, RSC, and medial PFC. Note the similarity of these regions to Figure 37.3, which is based on a meta-analysis of many studies covering a variety of lexical concepts.

3.4.1 Angular Gyrus

AG is activated for a wide variety of concepts. Bonner, Peelle, Cook, and Grossman (2013), similarly to the Fernandino et al. (2016) study, found that activation in the AG increased in a lexical decision task regardless of the sensory-motor feature associations of four types (sight, sound, manipulation, abstract). AG is activated more for concrete than abstract concepts, by abstract concepts relative to nonwords, and more by higher compared to lower frequency words. It is also more activated by combinatorial semantic stimuli such as sentences (Humphries, Binder, Medler, & Liebenthal 2006; Lyu et al., 2019) and by event concepts (Matchin et al. 2019). A number of studies have found AG to be important for thematic associations between concepts (e.g., *dog* and *leash*, *justice* and *law*) (Mirman, Landrigan, & Britt 2017). Its location between action and attention areas dorsally, auditory areas anteriorly, and visual areas posteriorly is ideal for a multimodal integrative region (Binder & Desai 2011). It has a likely role in two kinds of integration: one across time, such as the one needed for sentences, phrases, and events, and the second across features from multiple modalities, such as shape, color, sound, and motion. It also has multiple subdivisions that differ in their sensitivity to various factors, as well as in their connectivity to other regions (Seghier 2013).

3.4.2 Anterior Temporal Lobe

An area not present in the studies above, but associated with the role of a semantic hub, is the ATL. It is part of the 'hub-and-spokes' model, in which features are distributed in modality-specific cortices ('spokes') and are integrated into an abstracted representation in the ATL hub (Ralph, Jefferies, Patterson, & Rogers 2017). This hub is thought to be bilateral, with a mild leftward bias. Recent views suggest only the ventral ATL as a 'true' or maximally transmodal hub, with other ATL regions having graded hub-like characteristics (Hoffman & Lambon Ralph 2018). Patients with PPA-S (semantic dementia) with damage to ATLs show deficits in a variety of semantic tasks. Many imaging studies show activation in ATLs for processing words and sentences compared to non-linguistic control conditions. ATL is also implicated in processing of unique entities, such as names and faces of famous people and landmarks (Tranel 2009).

ATL's status as a semantic hub is, however, controversial for the following reasons. Some patients show mild or no semantic deficits after unilateral ATL resections. This lack of deficits after unilateral damage can potentially be explained, though, by proposing a bilateral rather than a unilateral hub. Many fMRI studies show no activation for semantic tasks, and especially nonverbal semantic tasks not involving unique entities. This lack of activation is usually explained by the fact that ventral and medial aspects of the ATL suffer from signal loss in fMRI. However, note that the majority of the ATL does not suffer from signal loss. Further, activation in ATL is seen commonly in specific cases (such as for abstract concept processing), but not for all types of concepts, and not for semantic tasks lacking a lexical component (such as picture association). Advanced PPA-S

patients, whose damage originates in ATL, do show both verbal and nonverbal semantic deficits. However, damage in these patients is quite extensive, and not restricted to ATL. Atrophy in moderate and severe patients extends to middle and posterior temporal lobes, and affects lateral, ventral, and medial temporal lobe, in addition to inferior frontal and subcortical regions. Hence, which of the deficits are specifically due to ATL atrophy is far from clear. When patients with atrophy restricted to the left ATL are selected, they tend to show only verbal, but not nonverbal, semantic deficits (Hurley, Paller, Rogalski, & Mesulam 2012; Mesulam et al. 2013). One proposal is the 'dual route' view, where the left ATL mediates verbal semantics, while the right ATL is critical for nonverbal semantics. However, this view is also controversial because such a clear left/right separation corresponding to a verbal/nonverbal separation in not found in many neuroimaging and lesion studies. In general, the use of methods with low spatial resolution, such as patients with progressive conditions or those with large lesions, to infer functions of relatively small areas of interest, is problematic and the cause of many controversies and inconsistencies in the literature.

Nonetheless, currently the more prevalent view is that ATL is a semantic hub, perhaps with multiple subdivisions, that stores integrated semantic knowledge. Our view is somewhat different. We suggest that the left lateral and polar ATL may have a lexical, rather than a general semantic role bilaterally. This area provides access to semantic features stored elsewhere, by connecting word forms to semantics bilaterally, rather than storing or integrating concepts themselves. Deficits interpreted as semantic are actually lexical in nature (i.e., involve impairments in *access* to concepts, but not to conceptual content itself), under our view. Similarly, it provides access to the names and knowledge about specific or unique entities, by performing the mapping between perceptual features (e.g., a face) and knowledge about the entity, but does not store that knowledge. The medial temporal lobe, including PHG and entorhinal cortex, could have a more salient role in nonverbal semantic processing. Under this view, the verbal/nonverbal distinction does not correspond to left vs. right ATL as suggested by the dual route view, but to a lateral/medial difference. Medial and posterior temporal areas are involved in nonverbal semantics bilaterally. The anterior one-third of the temporal lobe bilaterally only enables access to verbally mediated knowledge. When the atrophy spreads to middle and posterior temporal regions, especially to mid-FG and PHG known to be involving higher-order visual processing, visual semantic deficits are also seen.

Emotional valence and social cognition are also associated with ATL, but specific subdivisions sensitive to these domains are not well understood. ATL is connected to the orbitofrontal cortex and VMPFC through uncinate fasciculus, which has a central role in evaluation of emotional valence and reward processing. It is less clear whether valence processing takes place in ATL itself, or ATL only receives this information from orbitofrontal cortex. In summary, ATL occupies a prominent role in semantic cognition as a potential hub, but its exact role and potential subdivisions remain controversial and a subject of active research.

3.4.3 Posterior MTG/ITG

In addition to these two areas, the left pMTG/pITS/pITG complex is frequently activated by concrete concepts, verbs, and sentences, and damage or stimulation of this region impairs comprehension tasks (Dronkers, Wilkins, Van Valin Jr., Redfern, & Jaeger 2004). Damage to this general region, often including AG, causes transcortical sensory aphasia. Here, lexical comprehension abilities are impaired, but phonological and speech production abilities (e.g., repeating words or sentences) are intact. Based on these findings, combined with activation from a number of imaging studies, this region has been proposed as a hub or a 'lexical interface'. However, this interpretation is applicable mainly to concrete concepts, as standard clinical tasks such as picture naming, word-picture matching, and sentence-picture matching involve only concrete items. Imaging studies show that abstract concepts do not strongly engage this complex. In an MEG study of sentence processing, Lyu et al. (2019) found activity in left pMTG to be reflective of verb meaning, and a directional

connectivity from pMTG to AG/SMG. They suggested that information about verb semantic content is continuously generated in the pMTG as the speech input accumulates, and is continuously delivered to AG/SMG for further integration.

While pMTG is often lumped together with pITG in lesion literature, it is worth distinguishing these areas. Selective damage to pMTG or to pITG is rare, and hence imaging is more useful in parcellating their functions. PMTG is at the intersection of a number of different white matter pathways (Figure 37.1b), and is especially important for sentence-level processes (see Sentence Comprehension section below). Some investigators have suggested that it is important for 'semantic control', giving it a more executive role in retrieval and comparison or selection of concepts rather than storage and integration of features (Lambon Ralph et al., 2017). PITG, extending into FG, on the other hand is important for motion- and action-related processing, and also other visual features such as shape and color. This is consistent with its role in representation of concrete concepts.

3.4.4 Posterior Cingulate Complex

This region consists of pCiG, RSC, and precuneus, and is consistently activated in semantic processing (Figure 37.3). The precise role of this region for language and semantics is not well understood. A possible function can be linked to episodic and spatial memory evoked by concepts. Two functional subdivisions of this complex have been suggested: an anterior section involved in mental imagery, and a posterior section important for episodic memory retrieval. RSC also has a prominent role in spatial memory, and in egocentric vs. allocentric spatial processing. Greater activation of RSC and anterior pCiG is seen for concrete concepts. This can be related to mental imagery and spatial nature of episodes associated with concrete concepts. Abstract concepts activate a more posterior/dorsal section, associated with episodic memory retrieval that may be less spatial and more social/emotional in nature. This explanation supports the notion of 'situated conceptualization', according to which concepts are understood and processed in terms of situations or contexts in which they occur. Categories are formed by a large collection of situated simulations, and not by abstracting over all contexts that objects or actions occur in (Barsalou 2016), explaining the role of the posterior cingulate complex.

3.4.5 Content of Representations

One unanswered question relates to the nature of representations in these putatively integrative regions. It is clear that in many cases, raw sensory information has to be abstracted over in order to form coherent categories (e.g., a vehicle category that abstracts over features of trains and tricycles). When sensory-motor features are integrated into a whole (assuming that they are), is this modality-specific information retained or completely discarded? Opinions fall into two broad groups. One view is that modality-specific information is retained in some fashion (e.g., an image-like representation of an object that represents its shape and color features). Perceptual information may be recombined, weighted, and transformed, but the concept still carries a 'stamp' or format of the original modalities. Thus, integrated concepts are *multimodal* or *heteromodal* because the modality-specific information is still 'there' in some respect. An alternative view is that information in sensory-motor format is discarded in the service of abstraction. Concepts sit above any sensory-motor or action-perception traces, and hence are described as *amodal* or *supramodal*. Some authors have argued that both forms of representations exist simultaneously, and are used in a task-dependent manner.

One terminological clarification is warranted here. Labels such as 'amodal' or 'multimodal' used above refer to the *content* of concepts. The same labels are frequently used in literature to refer to the modality of the *input* through which the concept is accessed. For example, a word can be presented in a written or spoken form. An area that is activated by both of these forms

is called an amodal area, in that it is insensitive to the visual or auditory modality of the input channel. Similarly, areas activated both by printed words and pictures are often referred to as amodal, this time treating verbal and nonverbal inputs as modalities. However, common activation by different input channels does not imply that content of the concept—the nature of information that is activated by these inputs—is amodal or abstract. For example, if modality-specific shape and color information is activated by auditory presentation of the word *banana* (as suggested by embodiment theories), it would also be activated by a picture of a banana. The activation that is common between these two presentation methods is modal (higher visual cortex sensitive to shape and color) with respect to conceptual content, but is amodal with respect to input channel (activated for both auditory and visual input, and for both verbal and nonverbal input). When reading literature or evaluating arguments about modality, it is essential to distinguish between these two uses of terms such as 'amodal': modality of input channel and modality of conceptual content.

4. Speech Perception and Production

Speech is a critical modality through which we access language. Children typically acquire language through speech well before they learn to read or write. Our auditory system is exquisitely tuned to rapidly process speech, so that we can comprehend several words per second, each containing many phonemes that have a great variety in their physical signatures. Heschl's gyrus in the superior temporal lobe houses the primary auditory cortex bilaterally, where all speech and nonspeech sounds are processed. Heschl's gyrus and planum temporale, an area located just posterior to it, perform a spectrotemporal analysis of sounds (i.e., the analysis of sound waves over time with respect to amplitude and frequency content). The lateral STG represents subphonemic features and feature combinations (Chang et al. 2010). Moving ventrally, the mid- and posterior STS process phonemic sounds (Desai, Liebenthal, Waldron, & Binder 2008; Yi, Leonard, & Chang 2019). Investigators have looked for a 'map of phonemes' in STG, where neurons might be laid out according to their preference for a particular phoneme. However, there is no clear evidence for such a map. Rather, neurons that respond to onset of speech (in pSTG), and neurons that are responsive to the sustained part of speech (in mid-STG), were found (Hamilton et al. 2018). Parts of pSTG, pSTS, and SMG are especially associated with representing phonological structure of whole words (Okada & Hickok 2006; Stefanatos 2008). These regions process speech sounds bilaterally, but there may be a difference in the sensitivity to temporal features in the two hemispheres. The 'Asymmetric Sampling in Time' hypothesis suggests that the LH is more dominant for processing rapid auditory variations (20–80 ms range), while the RH is more tuned to auditory patterns in the longer 150–300 ms range (Arnal, Poeppel, & Giraud 2016).

4.1 The Dual Stream Model

After initial spectrotemporal analysis of speech, according to the Dual Stream Model (Hickok & Poeppel 2007), further processing of speech proceeds along two pathways: the ventral and dorsal streams (Figure 37.5). The ventral stream interfaces with semantics and is used for comprehension (the 'what' pathway). It is proposed to have a lexical interface in pMTG/pITS that maps sound structure of words to semantics. This lexical interface connects to the conceptual network to retrieve meanings of words, which is proposed to be widely distributed. A combinatorial network in the lateral ATL is also part of this pathway, and combines lexical units to create larger units such as phrases and sentences. The dorsal stream, on the other hand, is used for speech production, and converts auditory representation of words into articulatory codes (the 'how' pathway). It is proposed to have a sensorimotor interface that maps sound structures of words onto motoric representations. This interface is localized to area 'Spt' at the posterior end of the Sylvian fissure

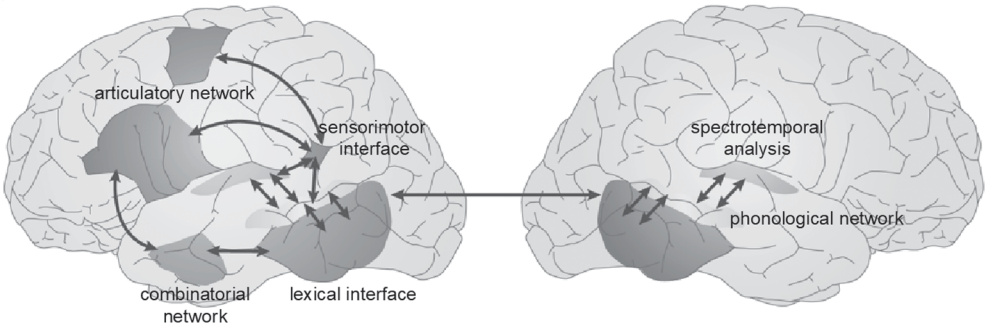


Figure 37.5 The Dual Stream Model. The lexical interface (pMTG/pITS), phonological network (light shading; mid-post STS), and spectrotemporal analysis (dark shading; dorsal STG) are bilateral. Other components are left lateralized.

Source: Adapted from Hickok & Poeppel 2007.

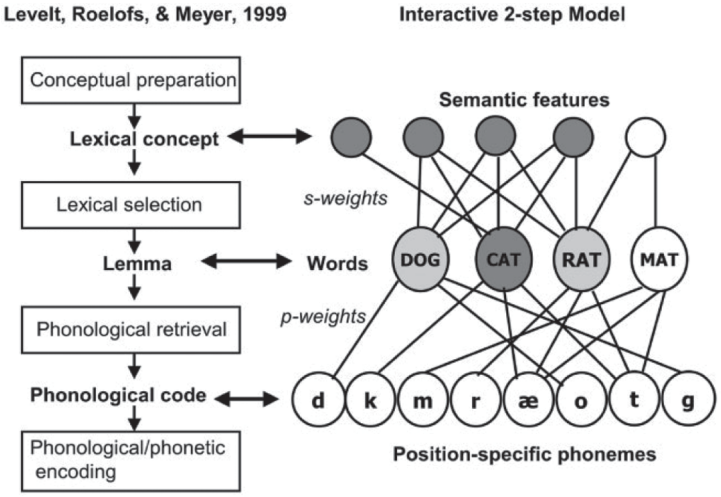


Figure 37.6 The Lemma Model (left) and the interactive two-step model (right)

Source: Adapted from Schwartz et al. 2009.

at the junction of parietal and temporal lobes. The dorsal stream ends in an articulatory network in the frontal lobe, involving the left pIFG, premotor cortex, and anterior insula, and is responsible for the production of an utterance. Thus, a broad distinction between form-to-articulation mapping (including the feedback necessary for prediction, error detection, and correction) carried out by the dorsal route, and form-to-meaning mapping in the ventral route, is proposed.

4.2 The Lemma Model

A prominent model of speech production is Levelt's Lemma Model (Levelt 2001) (Figure 37.6, left). It consists of two major subsystems that operate in a sequence: lexical selection and form encoding. Each subsystem is composed of discrete stages that also operate sequentially. Lexical selection starts with lexical concept retrieval, which consists of selecting a semantic structure that corresponds to the meaning one wishes to express. The next stage is lemma retrieval and

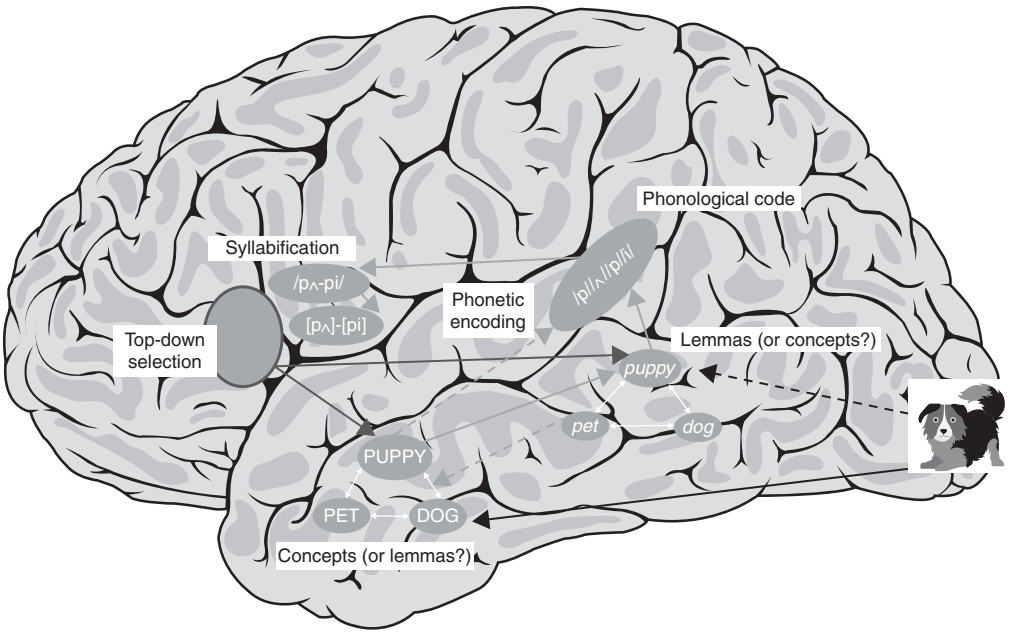


Figure 37.7 Potential neural correlates of components of the Lemma Model. Activation flow in a picture naming task starting from a picture of a 'puppy' is shown, which ends at the phonetic encoding stage, leading to the eventual motor output (not shown). The notion of, and distinction between, lemmas and lexical concepts is controversial. Solid lines indicate a more commonly accepted pathway. The dashed lines indicate an alternative pathway we suggest. (Some components of this figure are modified versions of a figure kindly provided by David Kemmerer.)

selection. Lemmas are abstract word nodes in the model that connect semantics and phonology, and point to morphosyntactic features such as grammatical class of a concept. In this stage, the lemma corresponding to the lexical concept is selected and its relevant morphosyntactic features are activated. The neural correlates of these two stages are not clear, but some suggestions have been made. Lexical concept retrieval is suggested to be underpinned by the ATLs, and lemma retrieval is associated with pMTG/pITG, at least when concepts are concrete nouns. However, some evidence is also consistent with the reverse scenario, with concepts and lemmas being associated with pITG/pMTG and ATLs respectively. The difficulty arises because in neuroimaging and in common neuropsychological tasks, it is difficult to distinguish between lemma and concept activation. In lesion studies, the spatial resolution is low (multiple areas are lesioned simultaneously), and damage to one area can have effects of processing in distal areas (diaschisis). Less controversial is the role of left IFG in both of these stages. The selection, or resolution of conflicts, between co-activated lemmas and concepts likely depends on the left IFG.

The lemma is then passed on to the form encoding subsystem, which has three discrete stages. Incremental construction of the phonological representation of the word to be produced is carried out in the phonological code retrieval stage. The left pSTG and SMG are likely where this process takes place. The next is syllabification, which is determination of the syllabic structure of the target word in a context-specific manner. The area most associated with syllabification is BA 44. The final stage is phonetic encoding, which involves specifying speech motor tasks to be accomplished (e.g., lip closure). It is associated with left frontal regions, including the anterior insula, BA 44, and the ventral prCG. The potential neural correlates of these components are shown in Figure 37.7.

4.3 The Interactive Two-Step Model

A key characteristic of the Lemma Model is its unidirectional and discrete stages, where activity is modular and flows only in one direction. Later stages of processing, such as phonological code retrieval, do not influence prior stages, such as lemma retrieval. Under this model, it is difficult to explain some empirical findings, such as the fact that 'mixed errors' are much more common in speech production than expected. An example of a mixed error is saying *rat* instead of *cat*, where the error is both semantically and phonologically related to the intended word. High proportion of these errors is explained more easily by a model where phonology and semantics influence each other. The interactive two-step model by Dell and colleagues (Dell, Schwartz, Martin, Saffran, & Gagnon 1997; Dell, Martin, & Schwartz 2007) is such a model (Figure 37.6, right).

The core of this model consists of three layers. A distributed 'semantic' layer contains units representing features of concepts, such as having four legs or making a 'meow' sound. This layer is connected to a 'word' layer that contains units representing whole words (*dog*, *cat*). The word units are in turn connected to the output 'phonology' layer that contains units corresponding to phonemes (/k/, /œ/, /t/). Activation flows in both directions between layers. Semantic units are activated by a picture of a cat, which activate the word node *cat*, and also activate semantically overlapping concepts such as *dog* and *rat*. Word units send activation to the phonology layer. The phonology layer feeds activation back to the word layer, activating the target word (*cat*) but also phonologically overlapping words such as *rat* and *mat*. When there is noise in the system, a word that is both semantically and phonologically similar to the target word is more likely to be produced, explaining the higher frequency of mixed errors.

In the Lemma Model, there are two separate representational levels called 'lexical concepts' and 'lemmas'. It is not clear to what extent these distinct levels exist. They are difficult to distinguish experimentally, as lexical tasks end up requiring or activating both, assuming that they exist. In Dell's model, there is instead a single 'words' layer. It is activated by the conjunction of semantic features (like 'lexical concepts') and connects to syntactic information (like 'lemmas'). Semantic knowledge is assumed to be distributed among many feature units, hence there is no notion of a separate lexical concept unit. The equivalence shown in Figure 37.6 between the lexical concept layer and semantic features is somewhat misleading in this sense, because there is no equivalent of semantic features in the Lemma Model, and lexical concepts and lemmas are combined into the 'words' layer in Dell's model.

Anatomical localization of the components of the model has also been attempted (Dell, Schwartz, Nozari, Faseyitan, & Branch Coslett 2013). The two main components of the model are *s-weights* that connect semantic units to word units, and *p-weights*, that connect word units to phoneme units. The p-weights were localized mainly to SMG, prCG, poCG, and insula, which are part of the dorsal stream in the Dual Stream Model. This is consistent with the role of these regions in creating representations related to output phonology, and then planning and producing the speech output. The s-weights were associated with ATL, IFG, MFG, and AG. These regions can be interpreted as involved in representation and retrieval of semantic information, and access of lemmas.

The extent to which speech production relies on modular and sequential processes, as opposed to interactive and cascaded activation, continues to be debated. A broad distinction between fronto-parietal areas responsible for phonological processing and speech output, and temporo-parietal cortex involved mainly in lexical access and semantics, with selection and control processes in frontal regions, is supported. The problem of speech motor control, required to produce an actual utterance, is not discussed here (for an advanced neuro-computational model, see Kearney & Guenther 2019).

5. Sentence Comprehension and Production

The expressive power of language relies crucially on the ability to combine words in novel ways. Comprehending sentences involves a number of processes beyond accessing lexical properties of words. This includes grouping words into phrases and clauses, and assigning participant roles to noun phrases. More so than in single word processing, these processes rely on short-term memory (STM), which keeps the linguistic material active while new words are integrated. Cognitive control also plays a more salient role in sentence processing, and is essential for extracting relationships between different units in a sentence, and monitoring and adjusting the interpretation of an utterance when needed.

A variety of neuroimaging and lesion-symptom mapping studies have identified important neuroanatomical components of the sentence processing network. Neuroimaging meta-analyses have implicated a large swath of lateral temporal, posterior frontal, and inferior parietal cortex of the left hemisphere in sentence comprehension, with temporal and parts of frontal cortex implicated bilaterally (Figure 37.8a; Vigneau et al. 2006; Hagoort & Indefrey 2014; Walenski, Europa, Caplan, & Thompson 2019). Lesion-symptom mapping studies have also implicated a mostly overlapping, but somewhat more restricted, set of regions important for sentence comprehension. For example, in a study of stroke patients, Dronkers et al. (2004) identified the following regions in relation to sentence comprehension deficits: pMTG/pITG, ATL, pSTS/pSMG extending into AG, aIFG (BA 47), aMFG, and LIFC (Figure 37.8c). Den Ouden et al. (2019) examined the impact of lesions to

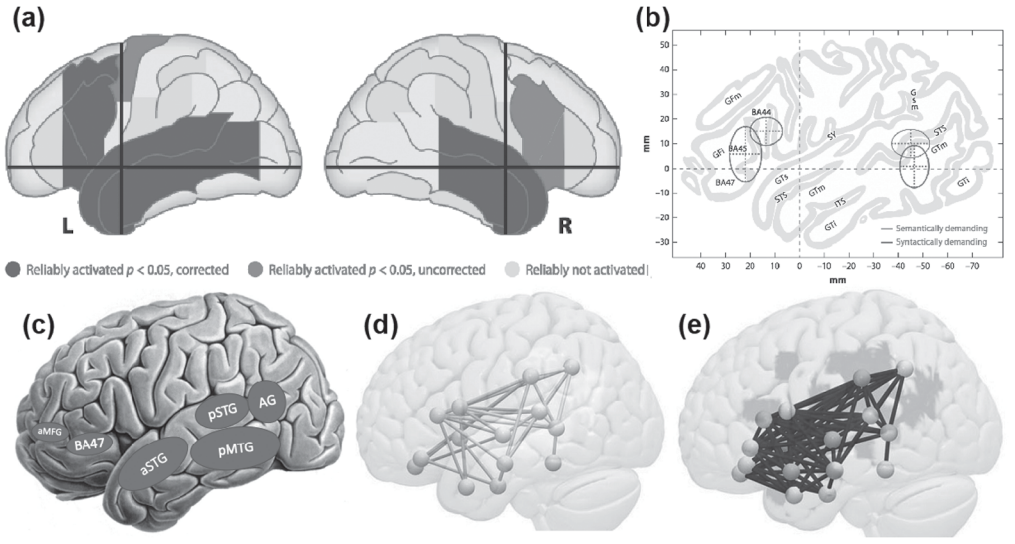


Figure 37.8 (a) Areas involved in sentence comprehension identified by a meta-analysis of neuroimaging studies. (b) Mean and standard deviations of peak locations from studies that manipulated semantic demands or syntactic demands, compared with corresponding less demanding sentences. (c) The main areas for sentence comprehension identified by Dronkers et al. (2004) in a lesion-symptom mapping study, with one modification. They identified a single area in pSTG that extended into AG. Here, pSTG and AG are shown as different areas because their likely functions are different (pSTG in phonology and AG in semantics). (d) Areas (with light shading) and white matter connections identified by Den Ouden et al. (2019) for an auditory sentence comprehension test in a lesion-symptom and connectome-symptom mapping study. (e) Areas and connections important for sentence production identified by the same study using a sentence production priming test.

Source: Both (a) and (b) adapted from Hagoort & Indefrey 2014; (d) and (e) adapted from Den Ouden et al. 2019.

areas and to connections between areas on sentence comprehension and found a network of mostly peri-sylvian regions (Figure 37.8d). These regions play different roles in sentence processing, though the specific roles of all of these regions remain controversial. Below, some of the prominent theories regarding their role are summarized.

PMTG is activated more for nouns and verbs that have ambiguous (compared to unambiguous) grammatical class in sentences (Snijders et al. 2009), dispreferred interpretations of ambiguous phrases (Tyler et al. 2011), verb meaning (Lyu et al. 2019), and lexical syntactic processing (Matchin et al. 2019a). Damage to pMTG is associated with decline in performance of many sentence types, including simple declarative sentences (Dronkers et al. 2004). Pillay, Binder, Humphries, Gross, and Book (2017) found that damage to pMTG/pSTS impairs auditory sentence comprehension even after regressing out picture naming (which controls for speech production and lexical semantics), pointing to its special importance for sentence-level processing. Thus, it could be important for keeping syntactic properties of words and phrases active while an auditorily presented sentence is processed. PMTG and more inferior regions (pITS/pITG) are also important for processing semantic information, especially related to action and motion, as mentioned above. PMTG has extensive structural and functional connectivity with other areas in the sentence processing network (Turken & Dronkers 2011), and hence can be thought of as a 'hub' that is centrally important for sentence processing. This is partly consistent with earlier views such as the Dual Stream Model, which designates pMTG as a 'lexical interface', taking phonological forms of words as input and producing syntactic and semantic codes. However, these results suggest extending its role to incorporate sentence-level operations (in conjunction with LIFC) as well as semantic contributions, especially action-related concepts. These data perhaps also weaken the traditional strict linguistic distinction between lexicon and syntax (or words and rules) and point to their intertwined nature. Keeping with this expanded view, in the framework of Matchin and Hickok (2020), pMTG creates hierarchical structures from sequential phonological structures in pSTG, and links them with semantics, in both comprehension and production.

ATL is especially sensitive to complex sentences, and could play a role in syntactic analysis and structure building. The dorsal ATL (aSTG/aMTG) is responsive to complex sentence structure even when sentences are not semantically sensible (Humphries et al. 2006). It shows greater activation with increasing syntactic complexity (Obleser, Meyer, & Friederici 2011). Two studies suggest that rather than a general role in processing syntax, its role is related to STM load. An fMRI study showed increasing activation with increasing 'syntactic depth' of words in a sentence tree structure (Brennan et al. 2012). An intracranial recording study by Nelson et al. (2017) found that activity in anterior and middle temporal lobe neurons was correlated with the number of open 'nodes' during sentence processing (e.g., in the sentence 'Ten sad students should often sleep', there are three open nodes when 'should' is processed, which are then thought to be merged into a single node—a closed constituent—that indicates an entity that should often sleep). Activity in ATL was also correlated with the number of closed constituents. These findings are consistent with a role of aSTG/aMTG in STM, used to temporarily hold elements while a complex sentence is parsed.

PSTS/pSMG is associated with auditory-verbal STM. It stores the sound-based representations of verbal material in an activated state for short durations, a vital aspect of the effective comprehension of spoken sentences (Binder 2017; Leff et al. 2009).

The neighboring AG is sometimes grouped together with pSTS relating to its role in STM. However, its likely function is different. As discussed above, it is activated for processing sentences compared to word lists in general, but is especially important for semantically reversible and noncanonical sentences (e.g., passives such as 'The bride was carried by the groom' and object clefts such as 'It was the bride who the groom carried') (Thothathiri, Kimberg, & Schwartz 2012). Thus, it could have a role in integrating semantic and syntactic structures over time, allowing determination of 'who is doing what to whom'.

The most controversial is perhaps the role of LIFC (or more specifically, Broca's area roughly corresponding to BA 44/45), which was thought to be central to syntactic processing and should be involved in processing all types of sentences. Perhaps surprisingly, several fMRI studies have found no activation in LIFC for sentence comprehension relative to word lists (e.g., Humphries et al. 2006). This is consistent with multiple lesion-symptom mapping studies (Dronkers et al. 2004; Pillay et al. 2017; Rogalsky et al. 2018), which found no relationship between damage to LIFC and sentence comprehension. On the other hand, some imaging and patient studies have found an association between LIFC and comprehension of certain types of complex sentences (e.g., Den Ouden et al. 2019), such as reversible passives and syntactically ambiguous sentences, as well as for syntactic violations. This has led to a number of different hypotheses regarding the role of LIFC. These hypotheses include: (1) extracting hierarchical structure from linear sequences, (2) implementing syntactic movement, (3) cognitive control and general cognitive task demands (Rogalsky et al. 2018), (4) rehearsal component of auditory-verbal STM (Rogalsky & Hickok 2011), and (5) implementing the process of 'unification'. Unification refers to deriving higher-level meaning from phonological, morphological, semantic, and syntactic building blocks (Hagoort 2016). A partial reconciliation between these proposals may be the idea that LIFC is recruited only when hierarchical phrase structure analysis is especially demanding, but not for relatively simpler bottom-up processing, and for generating morpheme sequences, which is always necessary during production.

Specific regions of LIFC have also been proposed to have different functions. For example, in Friederici's (2012) proposal, the frontal operculum (situated in ventromedial LIFC) works in tandem with aSTG to build local phrase structures. BA 44 links with aSTG, pSTG, and AG to build complex, hierarchically structured sequences. BA 45 and 47 work in tandem with temporal lobe structures to process semantic aspects of sentence comprehension. In Rogalsky and Hickok's proposal (2011), BA 44 primarily subserves the articulatory rehearsal component of auditory-verbal STM, while BA 45 implements a domain-general sequence processing mechanism. Matchin and Hickok (2020) suggest that BA 45 is critical only for production, because its role is to take the hierarchical structure developed in pMTG as input, and convert it to a sequence of morphemes. This view endorses the intertwined nature of syntax and semantics by arguing for a lexicalized view of syntax, where lexico-syntactic functions are jointly carried out by pMTG and BA 45. A lack of clear separation between lexical and syntactic processing, even in areas such as LIFC, pMTG, and pSTG, argues against the lexicon/syntax or words/rules dichotomy at the core of traditional linguistic theories.

Note that meta-analyses of neuroimaging studies (Hagoort & Indefrey 2014, shown in Figure 37.8a; and also Walenski et al. 2019; and Vignaue et al. 2006) show reliable activation of LIFC and other frontal areas. One might say that this activation is 'for sentence comprehension', but it is important to ask 'compared to what'? These analyses included studies that compared sentence conditions with low-level baselines, such as unintelligible sentences or false fonts, and some included lexical conditions such as word lists. In comparisons with low-level baselines, it is not clear whether activations reflect processes specific to sentence-level processing, or those related to general processing of linguistic materials such as phonemes, morphemes, and words, or general task-related demands not specific to sentences. Sentences compared to non-linguistic baselines almost always activate the LIFC, but comparisons with linguistic baselines such as word lists frequently do not. To eliminate activations due to low-level or nonspecific processes, Hagoort and Indefrey (2014) also compared sentences with high vs. low syntactic demands and high vs. low semantic demands (Figure 37.8b). High syntactic demands activate posterior LIFC (BA 44/46), while high semantic demands tend towards anterior LIFC (BA 45/47). In the posterior temporal lobe, peaks due to higher syntactic demands were centered around pSTS and dorsal pMTG, while those due to semantic demands were distributed around ventral pMTG, pITS, and pITG. Activations

in posterior LIFC and pSTS can be explained as specifically related to syntactic operations, or due to greater general cognitive demands required for syntactically complex sentences. The results also highlight the fact that just like LIFC, pMTG is also a heterogeneous area. While damage or activation in the vicinity of this general area is subsumed under a single label 'pMTG', giving rise to the notion that it is a 'hub', there are likely different functions subserved by pSTS, dorsal and ventral pMTG, pITS, and pITG.

In summary, sentence comprehension is a complex process subserved by a network of brain regions with dominance in the left hemisphere. A variety of roles have been proposed for these areas, that vary from more specific to language, such as building phrase structure, to less specific, such as extracting hierarchy and cognitive control.

5.1 Sentence Production

Sentence production deals with the important question of how we can put together a series of words to produce full sentences. Concepts are thought to go through the process of syntactic encoding that creates the surface structure of a sentence. The surface structure is then passed to phonological and articulatory processes. Relatively few neuroimaging studies have examined the process of syntactic encoding in the context of sentence production, mainly due to the methodological issue of head movement that is likely to be caused by producing sentences in a scanner.

Some of the first imaging studies of sentence production (Indefrey et al. 2001; Indefrey 2011) showed activation in the left pIFG (BA 44) for saying sentences such as 'The red square launches the blue ellipse' compared to saying 'square red, ellipse blue, launch'. Haller, Radue, Erb, Grodd, and Kircher (2005) found activation in the left BA 44 and 45 for sentence generation compared to sentence reading and word generation, and also in the left SMA and SPL.

A number of neuropsychological investigations of syntactic encoding that test patients with stroke as well as PPA also exist. Faroqi-Shah et al. (2014) tested stroke patients on picture description, picture naming, sentence, and nonword repetition tasks. They found that impaired sentence production was uniquely linked with pIFG, SMG, aSTG, insula, and putamen. Den Ouden et al. (2019) used three sentence production tasks on stroke patients, and found a similar network of regions. Examining the white matter damage, they found that sentence production deficits were related to connectivity between IFG and inferior parietal as well as anterior and middle temporal areas (Figure 37.8e).

Several studies have also examined patients with PPA-G where patients have sentence production deficits. For example, Sapolsky et al. (2010) found that atrophy in the IFG, MFG, SFG, prCG, and SMA was especially associated with sentence production deficits. Wilson et al. (2010) similarly found atrophy in IFG, prCG, and MFG to be associated with nonfluent sentence production, predicting effects on syntactic complexity, elicited from a picture description task.

Thus, the LIFC and other frontal lobe structures (SFG, MFG, prCG) are associated specifically with sentence production relative to word production. Additionally, connectivity of IFG to aSTG, pMTG, and SMG is also likely to be critical to sentence production. As noted above, the specific role of LIFC in sentence processing is controversial. It can be related to building hierarchical sequences and phrase structure, and selection of lemmas and words during sentence production. Relative to comprehension, sentence production also places greater demands on some executive and cognitive control processes, such as decision making, selection, and response inhibition. The role of other frontal structures may be tied to these processes.

6. Reading and Writing

While the vocal mode of communication is the most common, use of visually represented symbols—orthography—is another major form of communication that is important, especially in

modern life. Reading and writing are among the most important inventions in human history, as they enable preservation and accurate transmission of knowledge and culture across generations, without reliance on memorization.

6.1 Reading

What we know about words can be represented as a triangle, where the three vertices represent orthography, phonology, and semantics. In reading, the input comes through the orthography node, and leads to activation of the corresponding semantics and phonology. Because reading and writing are relatively recent inventions, developed only about 5,000–5,500 years ago, there are no evolutionary pathways specifically for processing orthography and connecting it to semantics and phonology. The goal of reading is to exact meaning. Two possible routes to meaning are the 'direct' route, orthography → semantics, and an 'indirect' route, orthography → phonology → semantics. Both routes contribute to reading to different extents, depending on the characteristics of the word. The major neural components of the reading system are shown in Figure 37.9a.

The vOTC plays a prominent role in reading. The reading pathway in vOTC starts with the analysis of low-level visual features of print in the occipital lobe (shaded regions in Figure 37.9a). A prominent model, the Local Combination Detector (LCD) (Dehaene, Cohen, Sigman, & Vinckier 2005), suggests that the pathway contains multiple levels of feature detectors, organized hierarchically. As one moves anteriorly along the vOTC surface, increasingly complex features are processed; starting from parts of letters, then whole letters, and then combinations of letters such as bigrams and trigrams are handled. The pathway culminates in the mid-FG, in what has been called the 'visual word form area' (VWFA) (McCandliss 2003), centered on the pOTS. According to the LCD model, the processing is also increasingly abstract, such that sensitivity to lower-level features such as location, font, and case is reduced as one moves anteriorly along this pathway (Vinckier et al. 2007).

Much research has been dedicated to characterizing the putative VWFA (Dehaene & Cohen 2011). It is generally accepted that it is more sensitive to printed words than to spoken words, and is not sensitive to location, font, and case of the text. It responds to words regardless of task demands

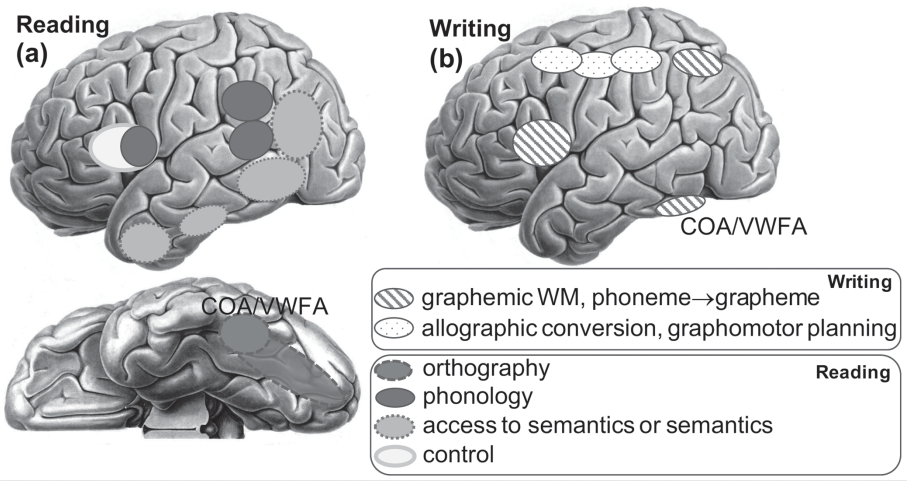


Figure 37.9 (a) Some of the main brain regions involved in reading. The semantic regions are especially more distributed; only some are shown. (b) Some of the main brain regions involved in writing.
Source: Based on a meta-analysis by Purcell et al. 2011.

and awareness, is sensitive to sublexical properties such as bigram frequency, and to pseudowords. Whether VWFA is dedicated solely to processing printed word forms, or it is also sensitive to other types of objects, has been controversial. Examining individual subjects to exploit high spatial resolution fMRI, and to avoid smoothing across neighboring areas, Mano et al. (2013) found patches in the pOTS in each individual subject that were more sensitive to orthographic stimuli (words + pseudowords) than to object pictures, controlled for low-level visual properties. They also found neighboring patches in and around pOTS that showed the reverse pattern. This suggests that the pOTS does contain sub-regions that are relatively tuned or specialized for orthographic material, and is not simply a general visual object processor. VWFA has been suggested to contain an 'orthographic lexicon' (i.e., an inventory of the orthographic forms of all known words). Using repetition priming with words and nonwords that are either identical or differ by one letter, Glezer, Jiang, and Riesenhuber (2009) found the left pOTS contains whole-word representations, supporting such a proposal. This idea runs into difficulty when you consider that VWFA is also sensitive to sublexical properties such as bigram and trigram frequencies within nonwords (Binder, Medler, Westbury, Liebenthal, & Buchanan 2006), and pseudowords often produce *more* activation in VWFA than words. Hence, it is not likely to contain only whole-word representations. Rather, it contains units or sub-networks that are finely tuned to familiar letter combinations of varying lengths, including whole words. In that sense, the name 'visual word form area' is a partial misnomer. A better term might be 'combinatorial orthographic area' (COA). This area is, nonetheless, a critical part of the system of orthographic expertise, and links spellings of words to their meanings and sounds.

Damage to vOTC can cause alexia, but this is not always the case. Severely impaired patients are not able to recognize even single letters. Less impacted patients are unable to read whole words with a quick glance, but instead read in a laborious manner one letter at a time and put them together. A different type of reading disorder is acquired dyslexia, in which reading is also impaired. The three main types of acquired dyslexia are phonological, surface, and deep dyslexia. (Note that these are different from dyslexia affecting children due to congenital abnormalities.) In phonological dyslexia, patients are especially poor at reading pseudowords, but can read most words. Damage to the shaded regions in Figure 37.9a is associated with phonological dyslexia, namely pIFG/BA 44, pSTG, and SMG (Rapcsak et al. 2009). Surface dyslexia is characterized by difficulty reading words with irregular spelling-sound correspondence (such as *yacht* or *pint*), especially if they are low frequency. These patients tend to make overregularization errors (*pint* pronounced to rhyme with *mint*). They perform relatively well at reading pseudowords and regular words. Surface dyslexia is often, but not always, seen in PPA-S (semantic dementia) patients (Patterson et al. 2006; Wilson et al. 2009), and is associated with damage to the shaded lateral temporal regions in Figure 37.9a. The co-occurrence of semantic deficits in PPA-S with surface dyslexia has led to the suggestion that for reading low frequency words with irregular spelling-sound correspondence, semantic retrieval is necessary. Because the direct orthography → phonology route is not sufficient (the orthography does not transparently tell you what the word is supposed to sound like), the indirect orthography → semantics → phonology route is used (word meaning is used to retrieve the sound of the word). This idea is somewhat controversial, due to a few reports of patients who have semantic deficits but are not surface dyslexic. Lastly, deep dyslexic patients are impaired at reading both regular and irregular words, as well as pseudowords. Errors tend to be semantic in nature and worse for abstract words. Damage in these patients is often more extensive, and involves temporal and inferior parietal areas.

Now we are in a position to delineate the likely locations of the nodes in the orthography/phonology/semantics triangle. VWFA/COA is the main combinatorial orthographic processor node. For combinatorial phonological processing, SMG/pSTG is most likely centrally important. As discussed earlier in the chapter, there is no one location in the brain that can be said to house semantics. However, middle and anterior temporal regions potentially provide access to distributed semantic knowledge. Thus, pathways connecting both phonology and orthography to distributed

semantics likely go through the anterior half of the temporal lobe. White matter tracts likely playing an important role in the orthography ↔ semantics and phonology ↔ semantics pathways are ILF and IFOF. There is no direct white matter pathway connecting pOTS with pSTG/SMG. Hence, the orthography ↔ phonology connection likely proceeds through multiple tracts, possibly including ILF and posterior segment of the AF.

6.2 Writing

Writing involves activating semantic and phonological structures of words first. These forms are then converted to letter strings on a medium such as paper, using tools such as a pen or a keyboard. In writing to dictation, phonemic analysis leads to activation of a phonological lexicon under some models. Activation of orthographic forms can proceed through phonology → semantics → orthography, or phonology → orthography routes. Once the target forms in the orthographic lexicon are available, they are thought to be stored temporarily in a *graphemic working memory* (WM) that keeps these forms active during the spelling process, and monitors and updates them (Figure 37.9b). The process of *allographic conversion* takes abstract representations in the graphemic WM, and translates them to specific letter shapes. *Graphomotor planning* refers to the specific movements required to draw these letter shapes that are the result of allographic conversion, which are then executed by the motor system. Activation of the phoneme system can also directly lead to orthographic activation, without intervening contributions from phonological or orthographic lexicons, or semantics. This is the direct phoneme → grapheme conversion route, which can be used for writing nonwords.

Orthographic units in the VWFA/COA, both at whole word and sublexical levels, are used for writing, just as they are used for reading. One of the candidate areas associated with graphemic WM is the left pIFG (Purcell, Turkeltaub, Eden, & Rapp 2011). The left pIPS and VWFA itself may also play a role, and these regions may jointly implement processes associated with graphemic WM. The phoneme → grapheme conversion pathway is also likely implemented jointly by these three regions, VWFA, pIFG, and pIPS. Allographic conversion and graphomotor planning are likely subserved by three fronto-parietal regions, pSFS/MFG, M1/S1, and aIPS/SPL. The aIPS/SPL region is important for selection and representation of letter shapes, and serves as an interface between motoric and linguistic processes. It is likely related to graphomotor planning. The pSFS/MFG has been linked to allographic conversion, but it is not clear if it has a role in planning as well.

Three types of acquired dysgraphia, or impairments in writing, have been distinguished that parallel the three acquired types of dyslexia: phonological, surface, and deep dysgraphia. Dysgraphia usually co-occurs with the corresponding type of dyslexia (Patterson et al. 2006), and hence the neural substrates of the two are similar at a broad scale. It is important to note, however, that rare instances of double dissociations have been reported (e.g., a patient with phonological dyslexia but no phonological dysgraphia, and vice versa for another patient). Existence of such cases suggests potential differences in pathways connecting phonology, orthography, and semantics for reading and writing.

7. Concluding Remarks

Building on the foundations laid by the 19th- and 20th-century neurologists, research on the neural basis of language has come a long way. As the review above demonstrates, major parts of the brain, including most of the temporal lobe and inferior parietal lobes, and parts of the frontal lobe, are among 'language areas'. While historically the lion's share of research was focused on understanding the two classic areas, other parts of the language network have now come to the fore. In particular, pMTG, ATL, and AG are the new 'rising stars of language', so to speak. Research is continually refining our understanding of their function as critical components of language processing.

The importance of networks and connectomics in providing a more holistic picture has also been appreciated, and our understanding of functional and structural pathways is also being refined.

Some methodological obstacles remain. The lesion method is a powerful tool due to its ability to causally identify important or critical areas for a function. At the same time, contradictions and confusion caused by the low spatial resolution (multiple functional areas damaged simultaneously), long-distance effects, reorganization of function in the lesioned brain, and biased distribution of lesions (some regions are damaged much more frequently than others; damage in multiple regions is correlated) are problematic and caution us against taking results of all studies at face value. These limitations can be partly overcome by rigorously testing very large samples of patients, but this is usually very difficult in practice. The correlational nature of neuroimaging methods is a limitation too. Both methods will continue to be the pillars of progress in the coming years nonetheless, importantly supplemented by brain stimulation studies. Examining individual subjects at the spatial scale of millimeters, and delineating information flow between regions (e.g., using high temporal resolution methods such as MEG and TMS), are likely to be two important avenues for future progress. Computational modeling for a more mechanistic understanding of language function, and studies of naturalistic discourse-level stimuli, have much to offer and are also likely to be fruitful areas of research in the near future.

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Related Topics

embodiment; categorization; concepts and conceptualization; cognitive linguistics and language pedagogy; cognitive linguistics and second language acquisition

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COGNITIVE LINGUISTICS AND LANGUAGE EVOLUTION

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1. Introduction

The present chapter connects up two research areas which belong to different disciplines, linguistics and evolutionary biology. The study of language, all through its long history from the ancient Greeks on, has formed part of the humanities—related to several sub-disciplines within it—and has traditionally explored the structural aspects of the system of language (Campbell 2001). On the other hand, biology in general studies living organisms, their anatomy and physiology together with the underlying biochemical processes which serve the various types of behavior exhibited by an organism. Furthermore, biology also studies the ontogeny and phylogeny of organisms and their various traits and behaviors. The study of behavior as a biological phenomenon involves therefore the study of the biological function and control mechanisms of the behavior in question, as well as both its development in the individual and its evolutionary history (Bateson & Laland 2013: 712; Hogan 2015: 108). Because human language can be considered a behavior system due to the fact that the use of a symbol system (i.e., language use) is a type of behavior exhibited naturally by human beings, such a framework will help us gain a better insight into how it works and also into its evolutionary origins (Croft 2013: 96; Hogan 2001: 254). This chapter will focus on how the study of language within the framework of Cognitive Linguistics relates to the issue of the emergence of language in the evolution of the human species.

Ethology, the biological study of behavior, relies on the method of conducting systematic observations of the particular behaviors of organisms. Based on these observations it describes the organization and regularities of the behavior and deduces its function in the organism's interaction with its environment. Through these observations the capacities on which the behavior is based can also be explored and it can be specified to what extent the knowledge of how to perform the behavior is genetically programmed or learned (Shettleworth 2010: 13). Furthermore, cognitive ethology attempts to establish what the cognitive capacities and cognitive processes are that the observed behavior is based on (Ristau 2013; Shettleworth 2010: 552).

The symbol system we call language is basically an abstracted form of the systematic regularities of a particular human behavior. It is on the basis of systematically observing the language behavior of members of a speech community and examining how they actually use language that the system of a particular language is deduced and its organization and regularities are described (Bybee 2006: 712). This method forms the foundation of any linguistic study and consists in

obtaining data on the concrete manifestations of language, i.e., the actual usage of one particular symbol system by its speakers in the form of utterances during their everyday communicative interactions. The general notion of human language as a symbol system relies on analyzing and comparing these data from individual languages with regard to the commonalities they exhibit. The task of linguistics is to study also the general aspects of the structural properties and regularities found in the various languages, which provides an input for an even more theoretical orientation within linguistics. The aim of exploring languages from this perspective is to establish basic underlying principles on which a theory of language can be built. Such a theory has the objective of answering the question of what language itself is and providing a general explanation of how it works, which will then serve as a basis for linguistic research in general (Langendoen 1998: 235; Schmid 2012: 371).

However, linguistics is not only interested in analyzing language behavior and describing its system characteristics. Modern linguistic theory is also concerned with the relation between the exhibited behavior, i.e., the handling of language as a symbol system, and the specific knowledge with its related cognitive capacities on which the behavior is based. This knowledge and the underlying capacities are inferred from language use, i.e., the regularities of the behavior as reflected in the system characteristics of language. Just like in the case of any other behavior, the following questions arise: how much and what part of this knowledge and capacities is genetically determined or acquired through social learning? In connection with the latter we must also ask how specific the involved learning mechanisms are and to what extent they are genetically determined (Goldin-Meadow 2015). Connected to these issues, a theory of language may also articulate ideas on problems such as what linguistic knowledge exactly consists in, what the relation between language and thought is, how language is related to the human mind and rationality, what the nature of language in general is, etc. These issues are the ones that also relate more or less directly to the question of where the capacity for language originates from in human evolution.

If we want to understand how language emerged in human evolutionary history, we also have to look at it as a biological phenomenon. This involves the study of the anatomy and physiology of the human vocal tract and auditory system as well as the anatomy and physiology of the language-related parts of the human brain in their interrelatedness with the specific type of behavior (the usage of the symbol system) and the underlying cognitive capacities and structures associated with it (Givón 1998). The task of this chapter is not to take such a broad perspective on language evolution but to look into how the theory of Cognitive Linguistics is related to the study of the evolution of language mostly from the perspective of human cognitive capacities and the nature of linguistic knowledge. In particular, it will examine, on the one hand, what Cognitive Linguistics as a theory has to offer for the study of how language emerged, and on the other hand, how evolutionist approaches to the origin of language contribute to and correlate with the tenets of Cognitive Linguistics.

2. Connecting Linguistics and the Study of Language Evolution

2.1 Linguistic Theories and Their Relation to Studying the Origin of Language

Traditionally, the question of the origin of language belonged to the subject matter of philosophy due to its close connection with the issue of the relation between language and the human mind, knowledge, and rationality. In the 20th century the more concentrated study of this topic resulted in a separate branch of philosophy, the philosophy of language (Cameron & Stainton 2015; Lamarque 1997). Nowadays, however, these issues are of considerable interest also to the field of cognitive science and constitute the subject matter of its sub-disciplines, cognitive psychology and cognitive neuroscience, to a considerable degree (e.g., Kemmerer 2015; Krill et al. 2007; Poeppel & Embick

2005). Consequently, these researchers' views and research results can be of relevance to linguistic theory as far as the issues of the human capacity for language, linguistic knowledge, and their origin are concerned.

The different paradigms in linguistics appear in general most prominently within the frames of the different schools of linguistics. Modern linguistics is considered to have started with Ferdinand de Saussure's structuralist approach at the beginning of the 20th century (Joseph 2016: 432; Matthews 2001: 151). Although Saussure was also concerned with treating language as a mental and social phenomenon, these aspects were later banished entirely from the structuralist approach (Allan 2007: 260–261; Seuren 2016: 4, 8). In brief, the structuralist theory considers language a system of components standing in explicit relations to each other and the interrelations between these components make up the structure of the language (Matthews 2001: 74). Although it is mostly the examining and describing of this structure that provides the input for investigating other facets of language, structuralism as a linguistic theory does not comprise aspects of language that relate to its cognitive and biological foundations and has therefore no direct impact on studying the evolution of language.

As important as the study of language structure in itself is, the social aspect of language implies that structure must have a function manifest in usage as purposeful behavior motivated by the interlocutors' communicative aim. It is this consideration that lies at the basis of functional linguistics, which is mostly considered to have originated in the 1920s with the ideas of the Prague School (Mackenzie 2016: 471; Sampson 1980: 103; Van Valin 2001: 328). Functionalism embraces a relatively broad set of approaches to the study of language and therefore its exact principles are not easy to pin down (Allan 2007: 263). However, in general it can be stated that a functionalist theory of language is founded on the conviction of the functionality of elements in the system of language and explains language as an instrument for the production of meaning in the communicative interaction of speakers in a sociocultural setting (Allan 2007: 254; Mackenzie 2016: 471; Van Valin 2001: 321). Considering the fact that the functional aspects of language involve communicative interaction, and this behavior is basically a biological function, functional linguistics—although indirectly—has the potential to provide a basis for the study of the emergence of language in human evolution (Givón 1998, 2013).

A comprehensive theory of language requires an explanation also of the nature of the knowledge underlying its structural and functional properties manifest in linguistic behavior. Unsatisfied with preceding work in the structuralist tradition, especially with Bloomfield's behaviorist and antimentalistic approach, in the second half of the 1950s Noam Chomsky started to develop a linguistic theory called Generative Grammar (Allan 2007: 295; Campbell 2001: 100). Generative linguistics approached language not simply as a structured system in itself but took a cognitivist perspective by inquiring into the knowledge underlying the system of language, especially its rule-governed character. The designation derives from the tenet of the theory according to which language incorporates a system of rules that are responsible for generating only those combinations of words—in an infinite number—in any particular language that result in grammatical sentences (Wasow 2001: 296). As opposed to a purely structuralist approach, which is concerned with identifying the structural relations between the elements of the system, in the generativist approach the structure is responsible for how the system works, i.e., it defines the rules of the workings of the system (McMahon 1994: 34). Generative Grammar presupposes the universal validity of this mechanism for all languages in the form of universal grammatical properties which are supposed to derive from a genetically innate universal grammar, a knowledge component of the language faculty, which constitutes a special organ of the human brain (Campbell 2001: 101). This assumption of the generative theory naturally raises the question of the evolution of language. However, at the same time it imposes explicitly predisposed constraints on a theory of language evolution, as becomes obvious from Chomsky's (2010: 51) rather biased claim, according to which "[t]he study

of the evolution of language is specifically concerned about UG and its origins". It predefines an explanation for the origin of the structural properties and the rule-governed character of language in the form of an organ emerging all of a sudden in a single step (Chomsky 1988: 170), which contradicts evolutionary theory (Corballis 2017).

The cognitivism of the generativist theory means that it regards language as an independent module of the mind where the autonomous knowledge of this system—primarily of its universal syntactic rules—resides. This knowledge is supposed to be completely self-contained and separate from the rest of cognition. As opposed to this, Cognitive Linguistics considers language structure motivated by general cognitive abilities and claims that conceptual organization and meaning are central to language, largely based on encyclopedic knowledge (Geeraerts & Cuyckens 2007; Taylor 2014). It takes a cognitive-functional approach to language, which means that meaning is the function of language itself and derives from human bodily experience with reality and from understanding this experience through our general cognitive mechanisms (Johnson 1987: 174; Lakoff 1987: xi). In this approach language structure is meaningful and functional because it is "a product of cognition and social interaction" (Langacker 2013: v; cf. also Givón 2009: 28), and grammar "can be characterized as a **structured inventory of conventional linguistic units**" (Langacker 1987: 57, emphasis in original). These tenets provide a totally different perspective for the study of language evolution from what the generative theory implies, as emphasized by Johansson (2005: 10), who also points out that the Cognitive Linguistics approach suggests that the emergence of language in the human species can be explained as resulting from the evolution of general cognitive capacities. This evolution involves a modification toward more complexity in the process of acquiring information about the environment, organizing it, and applying it in interacting with the environment, in line with Neisser's (1976: 1) classical definition of cognition (cf. also Shettleworth 2010: 13).

2.2 The Role of Linguistics in Studying Language Evolution

Language behavior relies on the knowledge of language, just like any behavior depends on the knowledge of how to perform that behavior, i.e., what to do and how to do it. Thus, the question of the origin of language is to a large extent related to the question where this knowledge comes from. On the Cognitive Linguistics view, linguistic knowledge is the structured knowledge of how to use language, and therefore this knowledge has a functional role, which is the guiding of language behavior. From this perspective the question of origin is primarily about the functionality of the behavior which this knowledge serves, which should be distinguished from the question of how it works, but at the same time the two issues should also complement each other for a proper explanation of the behavior (Scott-Phillips et al. 2011). Generative linguistics, on the other hand, rejects such a functional explanation of linguistic knowledge and considers the essence of this knowledge to be manifest in the form of a universal grammar built on the principles of the language faculty, which constitutes a given innate component of the human mind. These principles do not require any further explanation because they derive from the structure of the mind and "are not logically necessary" (Chomsky 1988: 26).

The capacity for language depends on the knowledge of how to use language, which is apparent in actual language behavior, i.e., the usage of a particular language. Even Chomsky's (1988: 48–49) imaginary "Martian scientist" has no other way of building a hypothesis about knowledge of language than resorting to the observation of how such a language is used by its speakers. This language, as an abstract system, is manifest in the regularities of the usage itself, which usage, at the same time, relies on the specific knowledge of the system, which knowledge is basically the knowledge of how to use the system. This interdependence between knowledge of the system and language use is apparent in the fact that a language—with its structural properties, its regularities, and the correlations between its elements—never constitutes a stationary system but continuously

changes through time as a result of changing usage (Croft 2013: 102, 113). Due to the interrelatedness described above, the changes in the system must be accountable for in terms of changes in the knowledge of how to use the language. In other words, there must be an interplay between language use and knowledge of language in which knowledge is flexible enough to allow for the changes in usage and also flexible enough to become modified through incorporating these changes. Cognitive Linguistics views this knowledge and usage as being dynamically interrelated in exactly this manner, conceiving the speaker's " 'internal' grammar […] as a constantly evolving set of cognitive routines that are shaped, maintained, and modified by language use" (Langacker 1987: 57). The functional relevance of this process lies in the fact that the changes in language use and their effecting structural changes in the system of language ultimately derive from speakers' efforts to reach their communicative and cognitive aims through expressive and efficient representation of their environment (Geeraerts 1997: 105; Langacker 2013: 222–223).

The interplay between the way language is used and the knowledge of the linguistic system derives from the cognitive function of language, which is to symbolically represent (with regard to both its building blocks and all their combinatorial characteristics) a community's shared knowledge of their natural and sociocultural environment in and with which they interact (Croft 2013: 104; Győri 2001a; Tomasello 1999: 95–96, 126–127). This environment is a dynamic system with constant fluctuation and changes in its conditions and components. Language must keep up with these changes in terms of their symbolic representation in order to remain a functioning cognitive-communicative system through which socially shared knowledge can be created, stored, and processed in order to facilitate a functional and adaptive interaction with the environment (Győri 2002: 133–134, 156–157; Tomasello 1999: 8–9). An inquiry into the emergence of the human linguistic capacity must necessarily take this function of language as a symbol system into consideration in the form of complementary constraints in their parallel evolution (Győri 1997).

The connection between linguistic theory and the study of the emergence of language is twofold. On the one hand, this connection is based on the fact that linguistics, through studying real, tangible manifestations of language on the basis of individual natural languages, is the legitimate authority for providing the relevant information on the properties and workings of language at the symbol system level (Dixon 2010: 1). Therefore, the claims of linguistics made in this respect must play a crucial role in inferring what the cognitive capacities and neurobiological underpinnings are on which the knowledge and use of the system rely and which we have to look for when studying the emergence of language in human evolution (Schuhmann 2007). At the same time the character and nature of the linguistically verified properties of language will also delineate the evolutionary mechanisms and pathways we must assume and use in our explanation for the emergence of language (Bybee 1998). Furthermore, it is the study of language which is supposed to identify the characteristics and underlying capacities of human language that should be subjected to comparison with behavioral characteristics and capacities in other animals, mainly in our closest ancestors, with the aim of looking for their possible precursors and eventually explaining their emergence and evolution (e.g., Fedurek & Slocombe 2011; Győri 1995; Scott-Phillips 2008; Seyfarth & Cheney 2017; Sinha 2004; Smit 2016).

On the other hand, when constructing a theory of language, linguistics must take into consideration the research results of related fields of study. Cognitive Linguistics definitely adheres to this requirement through being committed to making its "account of human language accord with what is known about the mind and brain, from other disciplines as well as one's own" (Lakoff 1990: 40; see also Lakoff 1991: 54). Furthermore, with regard to the evolution of language, a linguistic theory must attribute only such properties to language—concerning its structure and the way it works—which evolution could have realistically produced, that is, a linguistic theory should not come up with properties of language that appear to be in contradiction with standard evolutionary explanations of the emergence of biological traits or even unexplainable by evolutionary theory

(Lieberman 2016). Due to the biological definedness of language as reflected in its multifaceted nature, a valid explanation of language evolution can only be based on the standard mechanisms of evolution, which otherwise explain the evolution of all living organisms and their traits, i.e., their anatomy and physiology, as well as their cognitive capacities and behavior relying on these (Catania 2001; Corballis 2017; Győri 1999). All in all, the study of language evolution should produce a theory that provides explanations for the biological bases of all the properties of language that linguistics has established and revealed, whereas a theory of language should make no claims on the evolution of language without considering the views of evolutionary biology and related fields.

Thus, the role of linguistics in studying the evolution of language is to supply the proper information on the workings of the system of language from which then inferences can be drawn as to its nature, which can then serve as a basis for exploring how language emerged in the course of human evolution. However, in the case of a linguistic theory, an account of the workings of language is to a large degree a matter of presuppositions, which may also preordain different approaches to interpreting and obtaining the data on which a general theory of language is built. For instance, generative linguistics does not deem it necessary to rely on collecting data from as many languages as possible in the search for universal features—a logical requirement for the construction of such a theory—but considers the systematic analysis of only some languages sufficient for this endeavor (Evans & Levinson 2009: 430; Langendoen 1998: 235). Evans and Levinson (2009: 429) even argue that the world's languages exhibit crucial differences at every level of description to such an extent that a claim of "universals of language in the direct sense" can hardly be upheld. Therefore, the study of language has produced different theories of language based on different premises, often philosophically and ideologically determined (Evans & Levinson 2009: 430; Lakoff 1991: 62). The different views of the nature of language resulting from these divergent paradigms will also decisively influence the theoretical standpoint taken on the issue of the evolution of language (Jackendoff 2010).

3. The Study of Language Evolution

3.1 A Concise Survey of the Recent History of Studying the Origin of Language

As compared to the communication of other species, our ability to speak is such a unique and fascinating characteristic that the origin of language has intrigued humankind since antiquity. The interest in this question derives from the fact that human reason, rationality, and our capacity for thinking in general appear to be attributable to this distinctive ability with the system of language as their foundation (Hewes 1992: 7, 9; Mufwene 2013: 18). However, the philosophical speculations about this topic gave rise to all kinds of controversial ideas, which caused the *Société de Linguistique de Paris* to deem the subject unscientific and as a result a ban was imposed on discussing it at its meetings (Hewes 1992: 12; Mufwene 2013: 30).

As a consequence of the ban, any discussion of the origin of language was considered objectionable and unscientific for more than a century (Mufwene 2013: 30). However, in September 1975 a conference titled *Origins and Evolution of Language and Speech* was organized by the New York Academy of Sciences with the participation of a large number of specialists from many related fields, which brought an end to this attitude (Harnad et al. 1976). Soon thereafter the topic started to receive once again more and more attention from various disciplines, and in August 1981 another international conference was organized on the subject, the *International Transdisciplinary Symposium on Glossogenetics*, which was held in Paris under the auspices of UNESCO (de Grolier 1983). Initiated at this conference, the Language Origins Society, the first association of its kind, was founded in 1983 by two Dutch scholars, the geneticist Jan Wind from the Free University of Amsterdam and the linguist Bernard H. Bichakjian from the University of Nijmegen. With

members from all over the world working in various related fields, the society organized its annual conferences internationally (e.g., Wind et al. 1989; von Raffler-Engel et al. 1991; Wind et al. 1994; Győri 2001b). From 1985 on the Society also issued its own journal, the *LOS Forum* (ISSN 0929–0192). The interest in the subject also grew in Eastern Europe, and in December 1988 an international symposium titled *The Biology of Language* took place in Poland near Poznan with the participation of scholars from all over the world involved in research on the origins of language. The symposium was organized with the sponsorship of Adam Mickiewicz University, and its special focus was on the debate between Essentialism and Evolutionism with regard to the nature of language (Puppel 1995).

In 1996 a series of biennial conferences, titled *The Evolution of Language International Conferences* (now known as the Evolang conferences), started, with the first one held in Edinburgh. Today these conferences count as the major occasions for discussing research on language evolution also with regard to the subsequently published volumes, although a full proceedings was first published only in 2006 (Cangelosi et al. 2006). Soon after the first Evolang conference the 16th International Congress of Linguists took place in Paris in July 1997, where a round table session dealt with 'Language Origins Research, State of the Art as of 1997'. At this session the vast majority of the participants supported a motion for the disapproval of the original ban of the *Société de Linguistique de Paris* and for considering the topic of the origin of language fit for scientific inquiry (Foolen 2002: 37–38). The vast interest in the origins and evolution of language in our day is also shown by the launching of the *Journal of Language Evolution* (Oxford University Press) in 2016.

3.2 Approaches to Studying the Origins of Language

Language has several different sides and the understanding of its real nature requires studying all of these not only individually but together with their complex interrelations. This is a crucial requirement especially when inquiring into its origins because "the evolution of human language must have been an interactive process driven by multiple factors" (Givón 1998: 45). These factors must have shaped the various aspects of language which together amount to this specific type of human behavior. When studying the role the different factors might have played both individually and in concordance with each other in the emergence of language, one fundamental issue is the evolutionary function of this behavior as a whole because the question of function is fundamental in the 'ultimate' explanation of behavior, i.e., why a certain behavior evolved (Scott-Phillips et al. 2011: 38–39). This function must be the primary factor determining the intricate interdependence of the various aspects of language.

Language behavior is evidently social behavior and in its observable form communicative behavior. However, the semiotic function of language is not just communicative but also cognitive, which is an essential aspect of language as a semiotic system. The signs of the system are symbolic in nature and therefore simultaneously serve communication and mental representation (Deacon 1997: 22; Givón 2009: 21; Győri 2001a). As an outcome of this coupling of the two in a symbolic form, language made it possible to enhance the complexity of the "social super-model" of reality (Csányi 1992: 31, 2001: 47). It provided an extremely efficient means for "symbolic cognition", i.e., gaining knowledge about reality without direct experience (Győri 1997: 47, 2001a: 117; Harnad 2005: 37), which made it possible to exchange individual perspectives on reality and to create collective perspectives that were several orders of magnitude more complex in character, while also incorporating new perspectives on a changing environment (Tomasello 1999: 8–9, 2014: 76). In line with this, Sinha (2004: 224) claims that one of the most important criteria for the emergence of symbolization was construal, which in Cognitive Linguistics is the taking of a particular perspective on a certain situation. Furthermore, according to Gärdenfors (2004), one of the most important

functions and advantages of symbolic communication was that it made the cooperation about future goals possible (cf. also Gärdenfors & Osvath 2010). It is mostly these correlations that lie at the basis of functional approaches to language evolution, which offer explanations compatible with the Darwinian theory of evolution, in line with the need for an evolutionary account of the functionality of behavior (Scott-Phillips et al. 2011: 38–39).

Quiatt and Reynolds (1993: 141) describe social cognition as "[*t*]*he application of intelligence to the review of social information and the exploitation and management of social relationships toward attainment of short- and long-term goals*" (italics in original). Language co-evolved with the growing complexity of social cognition enabling a much more sophisticated and efficient social interaction (Croft 2017; Dunbar 2003: 174; Schoenemann 2017: 67). Because this interaction relied largely on the usage of a system of symbols, the question of the origin of the symbol system is also a crucial aspect in studying language evolution. In connection with the questions where this system comes from and how it emerged, most functional approaches take a vocal origin of language for granted, deriving it mostly from the vocal communication of our primate ancestors (e.g., Fedurek & Slocombe 2011; Lieberman 2006; Sinha 2004; Újhelyi & Buk 2001). However, it has also been repeatedly suggested as an alternative that the symbol side of language began in the form of a gestural sign system, the learning of which was facilitated by a relatively high degree of iconicity (e.g., Armstrong & Wilcox 2007; Corballis 2003; Hewes 1973; Tomasello 2008, 2014). Of course the question of how a switch in modality took place must also be answered, and therefore Kendon (2017) argues for a parallel evolution of language in the kinesic and oral-aural modalities as a solution to this problem (cf. also de Boer 2017; Levinson & Holler 2014; McNeill 2012; Slocombe et al. 2011).

In any case, in whatever modality language began, the origin of symbolicity has been attributed to the process of conventionalization of signs (e.g., Burling 2000; Sterelny 2012; Tomasello 2014: 93). However, the emergence of symbolicity in human evolution must also be accounted for from a cognitive perspective. In his evolutionary explanation of the emergence of the human mind, Donald (1991: 168) argues that the first step toward symbolization in human evolution was the emergence of "[m]imetic skill or mimesis [which] rests on the ability to produce conscious, self-initiated, representational acts". Mimetic representation comes about through the voluntary performance of motor acts imitating particular events, which also has "the advantage of referential displacement" leading to the sharing of knowledge (Sadowski 2009: 167; cf. also Morford & Goldin-Meadow 2001). Based on Donald's (1991) explanation of the role mimesis played in human evolution, Zlatev, Person, and Gärdenfors (2005) propose a mimesis hierarchy in terms of four steps in the domains of imitation, intersubjectivity, and gesture emerging from the skills of our primate ancestors and leading to human symbolic capacity as a cognitive adaptation (cf. also Zlatev 2008). As a result, "mimetic schemas can help explain the source of human cognitive uniqueness, providing a 'ground' for the evolution of language" (Zlatev 2005: 335).

In an evolutionary functional framework the emergence of the biological-mental capacity for language and that of language as a symbol system (most probably deriving from mimetic representations; see above) must have constituted parallel and complementary, i.e., co-evolutionary, processes (de Boer 2017), or as Bichakjian (2017: 123) put it, "[t]he potential for language and language itself developed through parallel and mutually fertilizing processes". The questions to be answered from this perspective are what the selection pressures were that favored the emergence of the capacity for using a symbol system in evolving hominids, and which aspects of language behavior could have served an adaptive advantage upon which these pressures acted. Therefore, language behavior cannot be a purely biological adaptation resulting from Darwinian natural selection due to its complex social character—both in terms of usage and learning (Sinha 2009). The emergence of language must have been a co-evolutionary process with an interplay between biological and cultural evolution where mutually reinforced selection pressures arose for the learning

and usage of a cultural symbol system and a biological-cognitive capacity to learn and use such a system (McMahon & McMahon 2013: 236; Schoenemann 2017: 67; Smith 2018: 9). In this vein Johansson (2001) accounts for the learnability of language on the basis of cultural emergence backed up by a biological substrate which is the result of previous, not language-related adaptations. He argues that "when the possibilities for keeping and reproducing a language are present, the structure of language as such adapts to those possibilities [and t]he human biological structure thus becomes the selecting environment of language structures reproduced in social interaction" (Johansson 2001: 155). Chater and Christiansen (2010: 624) also explain the emergence of language as a process of cultural evolution "in which some of the most powerful selectional pressures concern the degree to which specific linguistic forms are easy to learn, easy to use, and communicatively useful". As a result, the structure of language has been shaped through cultural transmission to fit the workings of the brain (Chater & Christiansen 2012), which must have been accompanied by a process of selection on genes for more advanced cognitive skills and brain growth (Lotem et al. 2017).

In general, functional theories agree that language evolved as the ability to form and use mental representations and communicate them for purposes of social interaction and social cognition. However, they vary in their focus with regard to the different aspects of the social and cognitive functions of language and thus they argue for different scenarios of language evolution on their basis. Typically these scenarios emphasize aspects like efficient communication for social interaction, symbolic representation, social cognition, and shared mental representations as having played a major role in the emergence of language (e.g., Burling 2005; Deacon 1997; Donald 1991; Dunbar 1996; Lieberman 2006; MacNeilage 2008; Tomasello 2008, 2014).

4. Cognitive Linguistics and the Study of Language Evolution

4.1 Theory of Language and the Question of the Origins of Language

Although in the case of language evolution theories within a functional framework the emphasis on different aspects of language gives rise to different scenarios of how language emerged, this does not mean that these explanations and theories start out from a specific linguistic theory or that they could be directly connected to a particular one. However, functional approaches naturally show several points of correspondence between their findings and the tenets of Cognitive Linguistics, due to the usage-based nature and functional orientation of the latter (Geeraerts & Cuyckens 2010). These correspondences are pointed out and explicated by several authors without taking these tenets directly as their starting point (e.g., Johansson 2005; MacNeilage 2008; Tomasello 2008).

When inquiries into the origins of language are explicitly based on a linguistic theory, then it is the tenets of Generative Grammar (e.g., Bickerton 1990, 2014; Fitch 2010; Friederici 2017; Kinsella 2009). The supposed biological orientation of the theory—due to the claim of a language organ (the language faculty) with an innate Universal Grammar—naturally raises the issue of the evolution of language. However, explanations of the emergence of language from the generative perspective are usually characterized by being based on Chomsky's Cartesian approach to language, termed "Cartesian science" (Berwick & Chomsky 2016: 88), on which the generative linguistic theory is obviously built (Loritz 1999: 9; MacNeilage 2008: 24–25). According to the Cartesian conception, language is the reflection of the given properties of the human mind (Chomsky 2009) because the structure of language as a representational system does not derive from how things are in the world but "from the structure of the mind itself [… and] do[es] not mirror in any direct way the form of things in the external world" (Chomsky 1981: 3). This is the reason why Chomsky (e.g., 2000: 73–74) has argued several times against any functional and evolutionary explanation of the language faculty (cf. also Hurford 2014: 1).

In contrast, Cognitive Linguistics looks at the structure of language as reflecting how we view and understand the world (Langacker 1987: 1, 2013: 4), i.e., as the cognitively embodied outcome of our interaction with the environment and its reflection in language behavior, and which, therefore, can be explained in evolutionary terms on a functional basis. As a result, there is no need for the Cognitive Linguistics theory to approach the question of language evolution with the objective of providing explanations of the origins of language that are congruent with its tenets. The theoretical framework of Cognitive Linguistics is in itself such that it is in agreement with Darwinian evolutionary accounts and cultural evolutionary explanations of the origins of human cognition and language (Johansson 2005: 10; MacNeilage 2008: 54), which follows from taking the results of other disciplines into consideration, corresponding to the requirement formulated by Lakoff (1990: 40) in the "Cognitive Commitment" (quoted in section 2.2).

The Cartesian conception embraced in generative linguistics is also supposed to provide the solution to "Plato's problem", i.e., the question of how it is possible that we know a lot without experience (Chomsky 1988: 3–4). In this framework the question where human knowledge comes from cannot be separated from the Cartesian essence of language (Loritz 1999: 13). In a theory of language with this philosophical underpinning, language must have a component which supports the Cartesian idea of special human knowledge and which is innate to our minds without explanation (MacNeilage 2008: 5). As a result, the essence of language is claimed to be syntax, "an autonomous system totally decoupled from questions of meaning and function" (Johansson 2005: 9), which, according to Chomsky (1988: 46–47), solves Plato's problem through its recursive character. This nature of the rules of syntax requires a mental capacity unique to humans residing in the language faculty, which—in Hurford's (2014: 27–28) characterization of the Chomskyan stance—"is a mental computational system for combining atoms of thought into more complex thoughts, purely for internal purposes, with no necessary link to public communication". Johansson (2014) has most convincingly shown the fallacies of such an explanation. Conversely to the generativist position, Cognitive Linguistics—as follows from its functionalist framework—holds that the structure of language derives from the functions it serves, like "communication, manipulation, expressiveness, and social communion" (Langacker 2008: 7).

When declaring the innateness of the language faculty and Universal Grammar, the problem is not with innateness *per se*. Many types of behavior and their underlying cognitive capacities have both innate and learned components and the question is basically what part and how much of the behavior develops based on genetic determination and what proportion and what aspects of it are acquired through learning (Breed & Moore 2016: 2). The problem is with the paradox that results from trying to give the Cartesian concept of innateness a biological interpretation while still holding on to the view that if a trait is innate then it could not be the result of Darwinian natural selection and adaptation. Because as Chomsky (2000: 73–74) explains, "[w]e must be careful not to succumb to illusions about evolution and its adaptive miracles. There is nothing in the theory of evolution that suggests that we should be able to answer questions that we can pose." However, biological innateness—the genetically fixed nature of a trait—is absolutely consistent with and in no way contradicts such an evolutionary explanation (Griffiths 2002: 71–72; Kirby et al. 2007: 5241; Mameli 2007: 32–33).

The reason why it appears necessary from a Cartesian stance to reject an evolutionary explanation in selectionist and adaptationist terms is that it would raise the possibility of linking human language to animal communication (Chomsky 2009: 63–64), and that would cast doubt on the special status of "humans [who] are fundamentally different from anything else in the physical world … [while] [o]ther organisms are machines" (Chomsky 1988: 5, cf. also 2000: 3). The claim of an innate language faculty on biological grounds but defying any explanation in terms of Darwinian natural selection and adaptation is supposed to give extra support to this Cartesian position. Therefore, the generative position does not accept the view that language emerged in the course

of evolution through standard mechanisms but attempts to explain the emergence of language in a sudden step as a result of a single mutation (Chomsky 1988: 170; cf. also Berwick & Chomsky 2016; Bickerton 1998; Kinsella 2009). In contrast, Maynard Smith and Szathmáry (1997: 290–291) quite convincingly argue that non-selectionist explanations cannot work for the origins of language (cf. also Cartwright 2016: 104; Győri 1999; Hurford 2011: 476; Lieberman 2016: 127; McMahon & McMahon 2013: 196). As Plotkin (2007: 11) critically remarks, the Cartesian position "that the evolution which accounts for all other features of our species does not apply to our minds" can in no way be sanctioned or approved.

Concerning the evolutionary origins of language with respect to antecedent traits and mechanism of emergence, Cognitive Linguistics holds the exact opposite view to the generativist position:

> From the evolutionary point of view, of course, it would not be surprising if human reason were to use and build on mechanisms for representing spatial relations that are present in lower animals. Indeed, the idea that abstract reason makes use of spatial perceptual mechanisms present in lower animals makes much more sense than the idea that reasoning came in all at once with man as a totally separate new cognitive faculty. The idea that abstract reason also evolved just makes more biological sense.
>
> *Lakoff 1990: 73*

Thus, Cognitive Linguistics is of the opinion that the linguistic capacity has evolved from and is based on cognitive capacities that we share with other animals, primarily the ones connected to the sense of space, both visual and kinesthetic. Givón (1998: 46) argues "that a big chunk of the neurology that nowadays support[s] human language is but an evolutionary outgrowth of the visual information processing system" (cf. also Givón 2002).

Generative linguistics is at odds with an evolutionary approach to language also because of the arbitrariness and autonomousness it posits for Universal Grammar and the language faculty, which makes it difficult to explain the emergence of language in evolutionary terms (Chater & Christiansen 2010: 625). Pinker (2003), therefore, argues for the functionality of grammatical structure and the usefulness of arbitrary features of language for communication. He claims that the language faculty evolved as an adaptation through natural selection for the function of communication because this functionality could not have arisen by "a single mutation, genetic drift, or arbitrary physical constraints" (Pinker 2003: 26; cf. also Pinker & Jackendoff 2005). However, Christiansen and Chater (2015) are of the opinion that an innate language faculty is rather implausible from an evolutionary point of view and argue that even the processing of recursive structure—claimed by generativists to support human uniqueness (Chomsky 1988: 46)—emerges "from domain-general sequence learning abilities" (Christiansen & Chater 2015: 24; cf. also McMahon & McMahon 2013: 200; Tallerman 2014; Vicari & Adenzato 2014).

4.2 The Tenets of Cognitive Linguistics in the Light of Language Evolution Research

If we look at how linguistic theory in general relates to the question of the origins of language and want to characterize Cognitive Linguistics as a theory of language in this respect, Lakoff's (1991: 62) statement on the commitments of Cognitive Linguistics is very telling: "The Cognitive and Generalization Commitments are just commitments to engage in scientific research, whereas the Chomskyan Commitment is a commitment to a program of speculative philosophy." Cognitive Linguistics does not have its own philosophically committed conception about language to which it wants to adjust the account of how language emerged, whereas the generative approach pursues

an explanation of the emergence of language in order to validate its own—philosophically biased—conception of language. Chomsky (2010: 51) himself stated that the task of studying how language emerged is essentially to inquire into universal grammar and where it comes from, even though its existence has seriously been questioned (e.g., Christiansen & Chater 2015; Dąbrowska 2015; Evans & Levinson 2009). Cognitive Linguistics considers "philosophical commitments […] and other assumptions about the nature of reason and language" as secondary if it comes into conflict with the primary commitment of the results of other disciplines with respect to the mind and brain (Lakoff 1991: 41), and—we might add—to evolutionary theory (cf. Plotkin 2007: 11). Among others, this means bringing research on language in line with what is known about evolution, in a philosophy-free manner. Therefore, it is not surprising that the tenets of Cognitive Linguistics are in line with the explanations and views of the evolution of language formulated in studies which examine the issue in an evolutionary framework free of any philosophical perspective.

This is also the reason why the tenets of Cognitive Linguistics need no scaffolding theory of language evolution specifically built on them, in contrast to the original aim of biolinguistics to support the basic tenets of generative linguistics (cf. Pleyer & Hartmann 2019: 3). With Cognitive Linguistics it is rather the other way round, which means that several views included in its basic tenets on how language is structured and how it functions are also considered and discussed in theories and explanations of language evolution not directly adhering to or deriving from a linguistic theory but which take a realistic functional view on language (Dunbar 1998; Johansson 2014). As is obvious from the above, the tenets of Cognitive Linguistics are such that they fit well together with functional and usage-based approaches to language evolution within a Darwinian framework. Consequently, the Cognitive Linguistics approach can very well complement the research on the evolution of language as demonstrated through studies by Pleyer and colleagues (Pleyer 2012, 2017; Pleyer & Hartmann 2014; Pleyer & Lindner 2014; Pleyer & Winters 2014). Their endeavor to incorporate the tenets of Cognitive Linguistics in studying language evolution has great relevance and potential for contributing to and furthering the research in this field. Pleyer and Hartmann (2019) have also examined the possibility of establishing converging points of view between biolinguistic and usage-based approaches.

Among these tenets the most basic one is the embodiment of cognition and language (Johnson 1987, 2018; Lakoff 1987), i.e., "the rejection of the classic mind/body duality", and thus "[i]n this respect cognitive linguistics is non-Cartesian" (Langacker 2010: 165). Closely connected to the notion of embodiment is the reliance of language on general cognitive mechanisms (Johnson 1987; Lakoff 1987) due to the fact that general cognition is based on perception of physical aspects of the environment, which information is processed for physical bodily interaction with the environment. On the Cognitive Linguistics view the answer to the question where human knowledge comes from is that it is this type of experience which is exploited in "human categorization [which] is essentially a matter of both human experience and imagination—of perception, motor activity, and culture on the one hand, and of metaphor, metonymy, and mental imagery on the other" (Lakoff 1987: 8; cf. also Johnson 1987: xv–xvi; Tomasello 1999: 89). Langacker (1987) has also shown how grammatical structure can derive from general cognitive processing (cf. Schoenemann 2017: 93; Tomasello 2014: 99). This claim is echoed in studies on language evolution stating that related cognitive capacities played an important role in the evolutionary emergence of language and even "most of the intricate structure of language must be shaped by general cognitive principles, combined with constraints of communication" (Chater & Christiansen 2010: 625).

This stands in full correspondence with the Cognitive Linguistics view that one of the major functions of linguistic expressions is to convey perspectives on situations between interlocutors (Langacker 1987: 120, 2013: 73). This means that language has first and foremost a social-cognitive function, namely transmitting knowledge, based on joint attention and the sharing of perspectives (cf. Tomasello 2014: 69). Pleyer and Hartmann (2014: 103) also argue on the grounds of Cognitive Linguistics that "the emergence of perspectivation and viewpoint phenomena in language and

cognition [… are] the most important aspect and function of language from an evolutionary and cognitive perspective". On this view, language, and even grammar, cannot be simply part of the individual mind but it resides in a population of human minds, which forms the environment for the selection of linguistic structures (Johansson 2001: 158; cf. also Harris 2001), and on this basis language must have evolved for simultaneously serving cognitive and communicative functions in the social interaction of humans (Tomasello 1999: 94–95). Tomasello (2008: 332) further states that the evolutionary formation of grammar took "place within the constraints of a panoply of general cognitive and social-cognitive processes".

In agreement with the above, Geeraerts (2010: 84) has drawn attention to the fact that Cognitive Linguistics views linguistic structure as organically related to socially and culturally situated cognition, which has relevant implications for the study of the emergence of language. It is due to this joint communicative-cognitive function that the social character of language is manifest also in linguistic structure through revealing conventionalized perspectives on our environment that are shared by a whole cultural community (cf. Tomasello 2014: 71, 107). The perspectival nature of language is also reflected in grammar, which is "an essential aspect of the conceptual apparatus through which we apprehend and engage the world" (Langacker 2013: 4). The emergence of grammar is by far not a marginal question in the evolution of language. Contrary to the generative linguistic explanation in terms of a genetically determined non-adaptive arbitrarily structured universal grammar arising due to a mutation, described as "evolutionary implausibility" by Christiansen and Chater (2015: 2) (cf. also Dąbrowska 2015), Cognitive Linguistics can contribute to this line of research by way of its realistic view of constructions as highly conventionalized, schematic, and abstract pairings of form and meaning based on language use (Diessel 2019; Johansson 2016; Pleyer 2017; Pleyer & Lindner 2014). In line with this Cognitive Linguistics approach to grammar, Sinha (2009: 307) asserts that grammar derives from human semiotic abilities and "it is a social institution, normatively regulating linguistic practice, and it is the practical ability to adhere to its constraints and supports that is acquired by the language learner".

5. Conclusion

This chapter has focused on points of connection between Cognitive Linguistics as a theory of language and the study of the evolution of the human linguistic capacity. The latter is a very broad topic involving different fields of research and, within those, different areas, which extend from evolutionary genetics and neuroscience to philosophy and linguistics. Naturally, here only those issues of language evolution have been dealt with which are more or less directly connected to linguistics and linguistic theory.

The main issues of a theory of language are on the one hand how the system of language is organized and why it is organized in that way, and on the other, what constitutes the speaker's knowledge of the system and what the connection between the organization of the system and this knowledge is. From this perspective the issue of the emergence of the human linguistic capacity is strongly linked to the question of the origin of this knowledge.

However, different linguistic theories approach the question of linguistic knowledge from different perspectives and on different grounds and therefore hold different views on what the nature of this knowledge is. This will of course preordain different explanations of the origin of linguistic knowledge entailing different accounts of the emergence of language. The issue of linguistic knowledge was first tackled by the generative linguistic theory, which claimed—based on a Cartesian philosophical stance—that this knowledge is autonomous and self-contained, residing in an innate language faculty of the mind with an inherent universal grammar. This view implies a non-functional and non-social nature of this knowledge and therefore also entails the refutation of both Darwinian and cultural evolutionary explanations of the emergence of language.

Cognitive Linguistics does not adhere to any philosophical conception in this regard and accounts for linguistic knowledge as deriving from language use in social communicative interaction by way of social learning. On this view language use and linguistic knowledge are dynamically interrelated and this relation is based on cognitive mechanisms which underlie our general intelligence. Linguistic knowledge is functional and has the role of facilitating the exchange of perspectives and the sharing of knowledge in a sociocultural niche. This standpoint is in line with the explanation of the emergence of the human linguistic capacity as being the result of general cognitive evolution on Darwinian grounds coupled with cultural evolution.

Further Reading

Hurford, J. R. (2014). *Origins of language: A slim guide*. Oxford: Oxford University Press. (The book offers a clear and precise overview of the state of the art in studying the evolution of the linguistic capacity and critically evaluates the merits and fallacies of the various hypotheses and approaches while drawing on the relevant disciplines on which the research in this field relies.)

Johansson, S. (2005). *Origins of language: Constraints on hypotheses*. Amsterdam and Philadelphia: John Benjamins. (The book provides a useful and accurate review of available evidence in the form of empirical data from a wide range of disciplines involved in language evolution research in a very accessible way and demonstrates how these data realistically constrain possible hypotheses of language origins.)

McMahon, A., & McMahon, R. (2013). *Evolutionary linguistics*. Cambridge: Cambridge University Press. (The textbook, written in a clear and readable style, gives a comprehensive introduction to the study of language evolution from an interdisciplinary perspective elucidating the connections between the different areas in an easily accessible manner.)

Tomasello, M. (2014). *A natural history of human thinking*. Cambridge, MA and London: Harvard University Press. (The book provides an exciting and stimulating analysis of the connection between human sociality and cognition based on comparative studies of humans and great apes, arguing that language co-evolved with culture in cooperative social interaction for the function of coordinating actions and thoughts.)

Related Topics

grammaticalization, lexicalization, and constructionalization; intersubjectivity and intersubjectification; cognitive pragmatics; culture in language and cognition; diachronic construction grammar

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39

DIACHRONIC CONSTRUCTION GRAMMAR

Dirk Noël and Timothy Colleman

1. Introduction/Definitions

The discipline of 'diachronic construction grammar' has been defined by some as "the historical study of constructions" (Barðdal & Gildea 2015: 42) and by others as a field of "work that addresses historical [linguistic] change from the perspective of one of the models of construction grammar" (Traugott & Trousdale 2013: 39). In terms of the metaphorical difference between trees and the wood, the former definition focuses on the trees, i.e., on the description of the history of particular form-meaning pairings, whereas the latter definition starts from the wood, implying a theoretical concern with the general principles of how languages change, i.e., of how their constructional resources develop. In this discipline no less than in others, contributions indeed differ in the emphasis they put on either description or theory.

As in construction grammar generally, the constructions dealt with in its historical branch range from fully lexically-specified ones to fully schematic ones and their meanings can either be of a more 'grammatical' or 'procedural' nature or of a more 'lexical' or 'contentful' one. The conceptual and terminological distinctions needed to talk about them are no different in diachronic construction grammar, but given that it centrally deals with how constructions and the constructicon develop historically, diachronic construction grammar does require greater recourse to processual terminology compared to the synchronic discipline, and sometimes a term originally used to refer to a cognitive process is extended to a diachronic development. The prevalent conceptual apparatus which we will briefly survey in this first section by way of introduction to this still very young discipline in large part goes back (though not always ultimately) to Traugott and Trousdale (2013), already referred to above as the source of the broadest of the two disciplinary definitions, because to date this is the only *de facto* textbook on it and is taken as a point of reference by many in the field. In it, they "draw opportunistically" on insights from constructional accounts of language "without adhering to one particular type of construction grammar" (Traugott & Trousdale 2013: 3), somewhat contravening part of their own definition of the discipline, but this approach in fact typifies much of previous and subsequent work in diachronic construction grammar.

The obvious phenomenon to start with is the development of new constructions, i.e., of new nodes in the constructicon, which is called 'constructionalization' (a term first used in this sense by Bergs & Diewald 2008 and Traugott 2008), and depending on the nature of the meaning of the

resulting construction a distinction is made between 'grammatical constructionalization' and 'lexical constructionalization', which are considered to be distinct developments. To refer to the development of schematic constructions, which can be either grammatical or lexical, the Langackerian term 'schematization', initially denoting an individual cognitive process, receives a phylogenetic interpretation in diachronic construction grammar. Historically developed 'schemas' (formerly 'macro-constructions' in Traugott 2008) can have 'subschemas' (previously 'meso-constructions'), which group similar 'micro-constructions' instantiating the same schema. The latter are lexically-specific constructions which are separately incorporated in the constructicon in spite of being instantiations of a schema. A telling example from Traugott and Trousdale (2013: 14) illustrating these three levels of abstraction is that of the English auxiliary verb *may*: *may* is a micro-construction of the subschema modal of the schema auxiliary.

Constructionalization is a kind of constructional change that results in a new node in a constructional network, but not all changes lead to new constructions and a distinction is made between constructionalization on the one hand and 'pre-constructionalization constructional changes' and 'post-constructionalization constructional changes' on the other. These 'constructional changes' affect one dimension of a construction only, either only its meaning but not its form, or the other way around. Traugott and Trousdale (2013: 23–25) illustrate this with the example of the development of the quantifier *a lot of*. Data from historical corpora appear to suggest that at the start of the 19th century speakers of English had started drawing the inference that the phrase *a lot of*, which originally could only be paraphrased with *a unit/piece/share of*, as in *a lot of land (for sale)*, implied a large quantity, as in *a lot of love*, where a possible paraphrase is with *much* and the original one no longer works. Evidence for the formal change from *lot* being the head of the phrase and the PP the modifier to the second noun being the head and *a lot of* the modifier only starts to appear in data from the second half of the 19th century, however, as when *a lot of goods* agrees with the plural pronoun *them*, and it is only then that the constructionalization of the quantifier *a lot of* is considered to have been completed because only then is there a pairing of a new meaning with a new form. As we will see below, however, this distinction between constructionalization and constructional changes, especially the pre-constructionalization ones, is not without problems. Examples of *post*-constructionalization constructional changes include (further) changes in the newly established form-meaning pairing's degree of schematicity or productivity as well as changes in its formal realization, such as the kind of morphological reduction and/or phonetic erosion effects well-known from grammaticalization research, but also the loss of subschemas of schematic constructions, which Colleman and De Clerck (2011) termed 'specialization', and the gradual disappearance of constructions, called 'obsolescence' by Traugott and Trousdale (2013) and 'constructional attrition' by Colleman and Noël (2012). It thus covers a diverse range of formal and semantic changes. The creation of new constructions, changes in their forms or meanings, and the disappearance of constructions or subschemas unavoidably affects the constructicon and Traugott and Trousdale (2013: 62–73) talk about growth, contraction, and reconfiguration of constructional networks in this regard. We will elaborate on these and the other concepts presented in this introduction in section 3 on critical issues and topics, and current research on it.

Like cognitive linguistics generally, and like most brands of construction grammar, diachronic construction grammar is either implicitly or, less often, explicitly associated with a 'usage-based' language model. For most practitioners in the field, this first and foremost, if not only, entails a focus on the frequency of use of constructions, whereas for some it also crucially involves attention to individual speakers' linguistic knowledge and consequently consideration to individual speakers' usage, i.e., to particular 'constructs', specific 'instances of use' or 'usage events' in texts. The latter approach has been termed 'radically usage-based diachronic construction grammar' (Noël 2016). The two approaches will be contrasted more extensively in section 5 on the main research methods in the field.

Before moving on to a presentation of representative research (in sections 3 and 4) and typical methodologies (in section 5), though, we will in the next section offer a sketch of the nascent history of diachronic construction grammar.

2. Historical Perspectives

Like cognitive linguistics overall, 'cognitive historical linguistics' was initially mostly concerned with (lexical) semantic questions (cf. Winters 2010). The advent of construction grammar near the end of the 20th century, however, meant increased attention to more schematic patterns situated towards the more abstract end of the lexicon-syntax continuum and before long there started to appear work which added a diachronic dimension to Adele Goldberg's research on argument structure constructions, exploring shifts in the forms and meanings of such schematic patterns (e.g., Israel 1996; Barðdal 2007). Concurrently but independently of this, there occurred a constructionist turn in research in the 'grammaticalization theory' tradition, which had started to recognize the centrality of constructions to grammaticalization changes (DeLancey 1994; Bisang 1998; Bybee 2003a; Traugott 2003) and the relevance of construction grammar for the study of grammaticalization (Croft 2001; Ziegeler 2004; Traugott 2008; Fried 2009; Trousdale 2012a, 2012b). Students of grammaticalization phenomena had also started arguing in favor of a usage-based approach, which typically meant a focus on the role of frequency and/or on the role of analogical reasoning in speakers' innovative language use (see, e.g., Bybee 2003b, 2010, and Fischer 2007, respectively). Contributing much to the convergence of these 'historical construction grammar' and 'constructionist grammaticalization theory' strands were the overlapping interest in schematic constructions and discussion of the extent to which schematization and grammaticalization were the same phenomenon (e.g., Noël 2007; Trousdale 2008a, 2010). The difference between 'grammaticalization' and 'lexicalization', which had long been an issue in grammaticalization theory, came to be discussed in constructionist terms (Trousdale 2008b), leading to the distinction made between 'grammatical constructionalization' and 'lexical constructionalization' in Traugott and Trousdale (2013). In fact, the very notion of 'constructionalization', as a change leading to a more or less stable, conventionalized, form-meaning pairing, is very much an ideological continuation of the grammaticalization theoretical tradition. Interestingly, in a monograph on constructional change that came out around the same time as the Traugott and Trousdale book, Hilpert (2013), who did not come to diachronic construction grammar from that older tradition, does not give a primordial place to grammaticalization and lexicalization types of change (see below for further discussion).

The second decade of the current century also saw the publication of the first edited volume dedicated to diachronic construction grammar, whose editors could by that time, in their introductory chapter, speak of an "ever-growing body of work within Diachronic Construction Grammar" (Barðdal & Gildea 2015: 11). Notice their capitalization of the discipline name, a convention not followed by all contributors to the volume, and outside it as well one more often encounters either 'diachronic Construction Grammar' (e.g., Trousdale 2012a; Jing-Schmidt & Peng 2016) or 'diachronic construction grammar' (e.g., Ziegeler 2004; Noël 2007; Trousdale 2012b; Traugott & Trousdale 2013; Peng 2013; David 2015). We prefer the version without capitals ourselves, given that we take 'diachronic construction grammar' to refer to any constructionist approach to historical linguistics, rather than to a rigorous historical implementation of a specific constructionist model. This also includes work on language evolution within 'computational construction grammar' (Beuls & van Trijp 2016) and work within the sub-discipline of 'diachronic construction morphology' (see the title of a section in Booij 2018, as well as Norde, in preparation).

3. Critical Issues and Topics

3.1 Constructionalization and/or Constructional Changes

Much of the work in diachronic construction grammar to date is concerned with how new constructions come about, now generally referred to as 'constructionalization'. This is the outcome of combined functional and formal changes either to morphosyntactic substance which previously did not have constructional status, e.g., the change from partitive to quantitative *a lot of* already referred to above, or to existing constructions, e.g., deontic modal auxiliaries becoming epistemic modals. Traugott and Trousdale's (2013: 91–92) explicitly usage-based account of how constructionalization happens makes reference to speakers and hearers, emphasizes the distinction between 'innovation' and 'conventionalization', both of them being necessary conditions, and stresses the 'gradualness' of change, in the case of grammatical constructionalization at least, i.e., it results from a series of 'micro-steps'. Innovation starts when a hearer interprets the meaning of certain linguistic substance, e.g., a form of *be going to*, differently from the way the speaker intended it, i.e., a "tenuous link" is created with a different part of the constructicon from that which would hitherto have accounted for the very same linguistic material, as when *he was going to be hanged* is interpreted to be about something happening later in time, rather than about the subject moving to a place for a particular purpose. The hearer then uses that material with the new meaning as a speaker, as in the adaptation of a rare 17th-century example, *she took off her stockings and was going to make a noose with them when* […], where making the noose does not require movement to a different place. No constructionalization has occurred yet at this stage, (a) because there is no formal change and (b) nothing has been conventionalized. A precondition for conventionalization is that other hearers go through a similar process and "tacitly agree" on the new meaning. Because the new meaning is likely to make it possible for the linguistic material to be used in a different formal context, as when *be going to* starts to be combined with inanimate subjects, there is a 'mismatch' between the newly conventionalized meaning and the original morphosyntactic form, which in the case of *be going to* stipulates an animate subject. Only when this mismatch is resolved through a conventionalized pairing of the new meaning with a new formal analysis can constructionalization be considered to have taken place, because a new symbolic unit, a new form-meaning pairing, or a new node in the constructicon, has come about. The changes leading up to it can then be considered to be 'pre-constructionalization constructional changes'.

This distinction between constructionalization and constructional changes can easily be seen to be a development of Traugottian grammaticalization theory. The monograph by Hilpert (2013) already referred to in section 2, on the other hand, more explicitly presents itself as an alternative to the grammaticalization approach and focuses on constructional change, considering grammaticalization/lexicalization/constructionalization to be types of constructional change at best and taking a broader view of constructional change than do Traugott and Trousdale (2013). Hilpert (2013: 16) defines that "[c]onstructional change selectively seizes a conventionalized form-meaning pair of a language, altering it in terms of its form, its function, any aspect of its frequency, its distribution in the linguistic community, or any combination of these". Although conventionalized form-meaning pairs, in other words constructions, are the point of departure of constructional change here, this should in fact not be taken to mean that Hilpert only deals with post-constructionalization constructional changes, because constructionalization as well always "seizes", i.e., starts from, lexical items in specific syntagmatic contexts, which are sanctioned by existing form-meaning pairs. In later work, Hilpert (2018: 22) explicitly mistrusts Traugott and Trousdale's differentiation between constructionalization and constructional changes even, because it "raises the question just after how many constructional changes exactly we have a construction that counts as a new node" (also see Börjars, Vincent, and Walkden (2015) for very similar criticism from a formal syntactic perspective).

This question has already been addressed in a study situated in the subfield of diachronic construction morphology by Norde and Van Goethem (2018), who found Traugott and Trousdale's framework difficult to apply in corpus research because it does not specify which changes are formal and which are semantic (in the example of *be going to* used above, for instance, why should the novelty of combining the pattern with inanimate subjects be a formal change?) and because it is difficult to operationalize the micro-steps it appeals to quantitatively. In this way, the distinction between constructionalization and (other types of) constructional change has met with criticism from both inside and outside of diachronic construction grammar and it is to be expected that the exact nature of this difference as well as its operationalization will remain high on the agenda for some time to come.

3.2 Changes in Schematicity and Productivity

Traugott and Trousdale (2013: 22) define constructionalization as being "accompanied by changes in degree of schematicity, productivity, and compositionality". The former two notions especially take pride of place in much work in diachronic construction grammar, whether this work explicitly adopts the distinction between constructionalization and other types of constructional change that is defining of the Traugott/Trousdale model or not. In fact, productivity—and the different ways in which this concept can be extended to apply to form-meaning pairings outside of the domain of word formation—was the central topic of Barðdal (2008), one of the earliest monographs in construction grammar with a (partly) diachronic outlook.

With Barðdal (2008), most practitioners in the field rely on the 'productivity as extensibility' concept, i.e., (partly or fully) schematic constructions are considered to be productive to the extent that they can attract "new" lexical items, or put differently, to the extent that their slots can be filled by lexical items from a large and, in principle, open-ended—though typically semantically and/or morphologically constrained—set (already see Goldberg 1995, and much more recently Goldberg 2019, on the *partial* productivity typical of schematic constructions, but see Kay 2013 for a different take on constructional productivity). Diachronically, it is possible for a construction's productivity to increase or decrease, as the constraints on the lexical filling of its open slot(s) become weaker, thus allowing the construction to be used with kinds of lexical items that it was not used with before, or, conversely, as the lexical constraints become stronger, thus reducing the construction's productivity domain to a sub-region of the previous one. Such productivity changes are tightly linked with changes in 'type frequency', which, in corpus-based work, is often used as a proxy for productivity, i.e., an increase in the number of lexical types attested with a given construction from one period to the other is taken to reflect an increase in constructional productivity. Barðdal (2008), however, emphasizes that productivity is a function of both type frequency and 'semantic coherence', i.e., constructions of relatively low type frequency can still display a certain degree of productivity provided these types are densely clustered in semantic space; conversely, constructions with relatively many types will not be easily extended if they display low coherence, i.e., if their types are scattered across semantic space (also see Barðdal & Gildea 2015: 34–41). Other case studies on historical productivity which take stock of both type frequency and semantic coherence include Davies and Kim (2019) on the *into*-causative in American English, and Gyselinck (2020) on the rise in productivity of the false reflexive resultative construction in 19th- and 20th-century Dutch.

The degree of schematicity of constructions is subject to diachronic change, too, i.e., the level of formal and/or semantic detail that is stored in their mental representations can change, or, put differently, they can become more or less abstract. Traugott and Trousdale (2013) discuss several examples of constructions increasing in schematicity—which often means that the same form comes to be associated with a more general meaning, as it is recruited by speakers to express (procedural) meanings that were formerly outside of its semantic range. Such changes qualify as

instances of (grammatical) constructionalization in that they imply that an existing node in the constructional network is subsumed by a newly created node with a more abstract semantics, situated at a higher level in the lexicality-schematicity hierarchy.

As is evident from this brief discussion, productivity and schematicity are closely related notions, which, in practice, can be hard to tease apart. Still, in a case study on the recent semantic history of the English *way*-construction, Perek (2020) emphasizes the importance of the theoretical distinction, arguing that it is possible for a construction to increase in productivity without a concomitant change in schematicity, i.e., without the constructional meaning necessarily becoming more general (also see Perek 2018).

3.3 Diachronic Constructional Semasiology

The studies by Perek mentioned at the end of the previous subsection are instances of work in which changes in constructional semantics are investigated *outside* of discussions of constructionalization, i.e., they deal with semantic changes in the English *way*-construction that have taken place long after the period in which this pattern emerged as a construction in its own right—changes which can be seen as instantiating post-constructionalization semantic change in a purely chronological sense only, not in the sense of changes that have taken place in the aftermath of constructionalization as a consequence of the establishment of a new constructional node. Other case studies along relevantly similar lines include Barðdal (2007), Hoffmann and Mukherjee (2007), Colleman and De Clerck (2011), Peng (2013), David (2015), Fanego (2019), and D'hoedt, De Smet, and Cuyckens (2019). Colleman and De Clerck (2011) label this approach as 'diachronic constructional semasiology' and emphasize the importance of studies with such a semasiological focus with a view to the further development of a construction-based theory of language change. One of the basic tenets of construction grammar is that there is no fundamental distinction between 'grammatical constructions' on the one hand and words and morphemes on the other: both are to be seen as stored form-meaning pairings, even if they differ in their respective degrees of complexity and schematicity (see, e.g., Goldberg's often-quoted catchphrase "It's constructions all the way down"; Goldberg 2003: 223 and 2006: 18). Existing research in diachronic lexicology has shown that the semantic structures of words (or, in constructionist parlance, atomic substantive constructions) are subject to various mechanisms of semantic change; Geeraerts (1997), for instance, provides extensive discussion of several examples. Obviously, lexical semantic change is not limited to the emergence of new words (and the disappearance of others) but also includes changes in the array of senses of existing lexical items, or in these different senses' relative degrees of structural weight, or in other aspects of their organization. The above-mentioned case studies provide and discuss examples of relevantly similar semasiological shifts in constructions of greater complexity and schematicity, thus corroborating the fundamental constructionist assumption that the difference between the grammar and the lexicon is one of degree rather than kind. Colleman and De Clerck (2011), for instance, discuss the semantic history of the English double object construction over the last three to four centuries in terms of a continuing process of semantic 'specialization'. Further research along these lines is needed to document the various kinds of semasiological shifts that can affect the semantic structures of argument structure constructions and other (partly) schematic constructions and to explore the degree of parallelism to attested mechanisms and pathways of change in lexical semantics.

3.4 The Disappearance of Constructions: Constructional Attrition/Constructional Loss

Just as the constructicon can be expanded through the establishment of new form-meaning pairings (or of new links between existing form-meaning pairings, see section 3.5), it is of course possible

for existing constructions to gradually become obsolete and disappear from the grammar. A continuing decrease in productivity can ultimately lead to the complete obsolescence of a construction, i.e., to the gradual weakening and, ultimately, disappearance of the constructional schema, with the possible survival of a small number of lexically substantive relics (such as the archaism *methinks* as a relic of the productive impersonal construction of Old and Middle English; see Trousdale 2008a). Colleman and Noël (2012) have coined the term 'constructional attrition' for this type of change, a label which, better than alternatives such as 'constructional loss' or 'constructional death' (both of which are used in, e.g., Sommerer 2018), underscores the gradual nature of the process. Extensive investigations of such cases of constructional attrition are fairly rare—perhaps as another consequence of the theoretical and empirical preoccupation with "grammaticalization-type" changes characterizing a lot of existing work in diachronic construction grammar, i.e., with *new* constructions or constructional meanings entering the grammar.[1] Other case studies, next to the ones already mentioned, include Petré (2010) and Noël (2019).

3.5 Connectivity Changes and Types of Connections in the Constructional Network

A critical issue that has only recently come to the fore is the question as to whether many changes that have previously been described as affecting (the form and/or meaning dimensions of) individual constructions, i.e., 'nodes' in the constructional network, might not be better thought of as changes in network 'connections'. Hilpert (2018), inspired by work by Torrent (2015), among others, suggests that a differentiation between node changes and (node-external) connectivity changes might be a useful complement or even alternative to the distinction between constructionalization and constructional changes, and he presents an embryonic new typology of types of change in the constructional network which gives examples of changes differing along two different dimensions: (i) whether they involve the emergence, strengthening, weakening, or disappearance of parts of the network, and (ii) whether these affected parts of the network are nodes or connections. The edited volume by Sommerer and Smirnova (2020) includes several chapters which further reflect on this distinction and discuss instances of (different kinds of) connectivity changes.

Of central importance to this "nodes vs. links" discussion is of course the question of exactly which kinds of connections can be assumed to exist in the constructional network. Traditionally, constructionist models have devoted ample attention to "vertical" links, i.e., inheritance relations between constructions situated at different levels of schematicity in a taxonomic hierarchy—such as the schemas, subschemas, and micro-constructions in Traugott and Trousdale's (2013) model. In addition, a number of recent studies have explored the role of "horizontal", i.e., non-taxonomic, connections in constructional change. An interesting example is Zehentner's (2017, 2019) account of the emergence of the dative alternation in Middle English in terms of the establishment of a paradigmatic link between the double object construction and the expanding *to*-dative. Zehentner observes that the semantic specialization of the double object construction previously discussed in Colleman and De Clerck (2011) happened at roughly the same time as a rise in both type and token frequency of the *to*-dative at the expense of patterns with other prepositions, suggesting a connection between them. These two trends reinforced each other, resulting in an ever greater degree of semantic overlap between the two constructions, and, concomitantly, in an increasingly stronger association between them, i.e., increasingly so, the *to*-dative and the double object construction came to be closely associated in the minds of language users as two different patterns available for encoding very much the same range of 'transfer' meanings. In this way, it is possible for a node-external connection to emerge between previously unrelated constructions. For other discussions of such non-taxonomic relations between constructions, rooted in formal and/or semantic similarity, see Van de Velde (2014) and Sommerer (2018), among others. Pijpops and

Van de Velde (2016) show that even superficial formal similarities between constructs sanctioned by otherwise unrelated constructions can influence their usage, an effect for which they coin the term 'constructional contamination'. Hilpert (2018), finally, suggests that the relations between (partly) schematic constructions and the lexical items that frequently fill their slots can also be thought of in terms of connections between different kinds of nodes in the constructional network; thus, his suggestion for a new typology of types of change in the network also includes shifts in the collocational preferences of schematic patterns—or, seen from the other direction, shifts in the complementation preferences of lexical items—as a subtype of connectivity change.

4. Other Nascent Research Strands

Next to the sizeable body of work revolving around the critical issues outlined in the previous section, two additional new research strands in diachronic construction grammar can be distinguished, both of which are related to recent trends in the wider cognitive linguistics framework.

First, a number of scholars have turned their attention to the investigation of *contact-induced* constructional change, thus contributing to the emergence of 'cognitive contact linguistics' as a new sub-discipline at the intersection of cognitive linguistics and language contact research (see, e.g., Zenner, Backus, & Winter-Froemel 2019). Relevant work includes Mithun (2008), Noël (2008), Doğruöz and Backus (2009), Pietsch (2010), Backus, Doğruöz, and Heine (2011), Höder (2012, 2014), Fischer (2013), Ziegeler (2015), Colleman and Noël (2014), Colleman (2016, 2018), Noël and Colleman (2018), and Ingham (accepted)[2]—the recent publication of an edited volume on *Constructions in contact* in the Constructional Approaches to Language book series (Boas & Höder 2018) is symbolic of the rise to prominence of this line of research. The studies referred to address a wide range of contact-related changes, which goes well beyond the emergence of new constructions in the target language constructicon under the influence of the source language; in addition, language contact can potentially affect the form, meaning, and/or frequency of use of extant constructions. Noël and Colleman (2018), for instance, present and discuss a case of contact-induced 'constructional renovation', where, in early 19th-century Dutch, a formerly productive construction that was in the process of disappearing from the language got revived as a consequence of the experiences of speakers of Dutch with a particular, influential kind of French discourse in which a formally and semantically equivalent French construction was frequently used. Future work may uncover still other subtypes of contact-induced constructional change; it remains to be investigated, for instance, to what extent the distinction between node changes and connectivity changes discussed in the previous section can also be applied to contact-induced change.

A second promising new research strand is the attention given to the roles of individual speakers in processes of ongoing constructional change and for lifespan variation, which is most prominently found in recent work by Peter Petré and collaborators (see, e.g., Petré 2016; Petré & Van de Velde 2018; Petré & Anthonissen 2019) and which will be further discussed in the next section, on research methods.

5. Main Research Methods

Research in diachronic construction grammar often explicitly aligns itself with a usage-based approach to language. As is the case in synchronic cognitive linguistics, for some this has become synonymous almost with a corpus-based approach and a preoccupation with frequency, resting on the either implicit or explicit assumption that frequency of use has cognitive relevance. Hilpert (2013: 207), for instance, contends that frequency matters especially to a constructional perspective on diachrony because "[a] cloud of exemplars may change not only through the addition of new formal or functional variants of a construction, but also when certain constructional variants are

registered more or less often than they used to register in the speaker's previous experience". One of the principal aims of his book is to showcase a number of modern statistical corpus-linguistic techniques that move beyond the mere extraction of token frequencies to the calculation of changes in the relative frequencies of constructional variants and changes in the frequency of the types which are generated by a constructional schema. Schmid (2015: 14), however, has posited that "corpus frequencies are a proxy for operationalizing conventionalization rather than entrenchment", meaning that corpora which aim to be representative of different stages in the history of a language can only reveal how a language has changed as a speaker-external system but that they provide inadequate basis for a cognitive account of how this change has come about. The reason for this follows from two of the axioms of his usage-based socio-cognitive 'Entrenchment-and-Conventionalization Model' of language: although "members of a speech community share linguistic knowledge", "no two members of a speech community have identical linguistic knowledge" (Schmid 2015: 4). In other words, cognition is by definition individual and one should consequently exercise caution in attaching cognitive significance to data that make abstraction from individual speakers.

Traugott and Trousdale's (2013) also explicitly usage-based account of constructional change is less quantitatively oriented than Hilpert's and relies more on qualitative evidence, i.e., on the discussion of specific instances of use in their textual context. On the face of it, to them a usage-based approach first and foremost entails an orientation towards speakers and hearers. Unlike Hilpert, they do distinguish between individual knowledge ("the representation of an idiolect, the reflection of an individual mind") and what they term 'community knowledge' ("the representation of the structure of [a language] at a given point in time" (Traugott & Trousdale 2013: 46). As linguists, their perspective is on accounting for changes in the latter, but Noël (2016) has argued that their account of constructionalization (see section 3.1 above) fails to untangle internal and external systems. In his view, the mismatch resolution which is at the core of it cannot be a cognitive operation because the mismatch does not exist *within* an individual's constructicon, which would entail a conflict between what speakers do and what they know, but can only exist between individual innovators' constructicons and other speakers' more conservative constructicons.

The question of whether diachronic construction grammatical modeling of language change indeed needs to disentangle individual systems from a conventionalized one very much depends on the answer to another question, viz. Hilpert's (2018) "open" question of whether diachronic construction grammarians should fully subscribe to the 'cognitive commitment' to psychological reality of cognitive linguistics. Hilpert (2018: 25) warns that imposing such a commitment might be detrimental to the field because there are many who appreciate the descriptive tools offered by construction grammar but whose studies are primarily directed at language structure, not cognition, and that it would be a severe mistake to ignore the insights provided by these studies. He does call on those who are committed to investigating cognition to state this goal explicitly, however, so that greater transparency can improve the falsifiability of diachronic constructionist studies.

In recent years, a body of research has started to accumulate which does exactly that by focusing on the role of individual cognition in constructional innovation. Noël (2016) has suggested the term 'radically usage-based' to characterize it, to emphasize that unlike most usage-based work to date it differentiates between individual, internal systems and social, conventionalized, external ones. What unites this research is the use of historical 'idiolectal' corpora, which allow a systematic comparison of the usage of individual speakers along a historical axis. Four examples of such work are Schmid and Mantlik (2015), Petré (2016), De Smet (2016), and Fonteyn (2017). Schmid and Mantlik (2015) look at both the individual entrenchment and the conventionalization of the [N *BE that*] construction in a data collection that discriminates between over a hundred historical authors. Petré (2016) examines the competition between [*GO to* INF] and [*BE going to* INF] in the oeuvres of a score of 17th- and early 18th-century authors to find evidence that the latter pattern

was an "extravagant" innovation (also see Petré & Van de Velde 2018). De Smet (2016) studies the recent development of the noun *key* into an adjective through an analysis of data for well over a hundred different speakers collected from the Hansard Corpus, covering the 1970s, 1980s, and 1990s, in which he links individual speakers' use of the innovative construction with their use of more conventional constructions that provide "analogical support". Fonteyn (2017), finally, reflects on the significance of non-alternators in cases of ongoing linguistic change, i.e., what do individuals who do *not* have variable grammars but consistently use either only the older or only the newer construction in cases of emerging grammatical alternations reveal about the cognitive principles that are hypothesized to underlie the alternation in question. Such research constitutes a clear departure from more orthodox corpus research and is probably the way forward in diachronic construction grammar, not just for the investigation of constructionalization, or, more broadly, the emergence of new forms and/or meanings, but also, as argued by Noël (2019), for the study of constructional attrition. In a radically usage-based perspective, this should normally start from what one could term 'innovative attrition', because just as some people will always have led the way in expressing certain meanings in novel ways, it should be the case as well that everyone will not have stopped expressing certain meanings and/or expressing them in certain ways all at the same time. Such intragenerational interpersonal differences still need to be established empirically, however, before the even more interesting question can be addressed of whether diffused constructional attrition can also be observed to have taken place on an intraindividual level, within the human lifespan.

Notes

1 Though it should be added that the emergence of "new" and the disappearance of "old" constructions in particular sub-regions of the constructional network are, in many cases, interrelated processes in that, typically, constructional attrition is at least partly motivated by the emergence of a new construction—or the expansion of an existing construction—which gradually encroaches on the older construction's functional-semantic domain. Thus, Trousdale (2008a), for instance, discusses the end of the English impersonal construction in relation to the emergence of a (more) schematic transitive construction.
2 In addition, the phenomenon of 'constructional borrowing' was already discussed in an early, unpublished, paper by Adele Goldberg (1990).

Further Reading

Traugott, E. C., & Trousdale, G. (2013). *Constructionalization and constructional changes*. Oxford: Oxford University Press. (The first and, to date, only textbook on diachronic construction grammar, which introduces the distinction between 'constructionalization' and 'constructional changes'.)

Hilpert, M. (2013). *Constructional change in English: Developments in allomorphy, word formation, and syntax*. Cambridge: Cambridge University Press. (A monograph that presents a different view on constructional change, crucially focusing on the cognitive relevance of changes in the frequency of constructions.)

Barðdal, J., & Gildea, G. (2015). Diachronic Construction Grammar: Epistemological context, basic assumptions and historical implications. In J. Barðdal, E. Smirnova, L. Sommerer, & S. Gildea (Eds.), *Diachronic Construction Grammar* (pp. 1–49). Amsterdam: John Benjamins. (The introduction to the first edited collection on diachronic construction grammar, which describes its epistemological roots.)

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Related Topics

construction grammar and frame semantics; multimodal construction grammar: from multimodal constructs to multimodal constructions; grammaticalization, lexicalization, and constructionalization; cognitive linguistics and language evolution

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40
MULTIMODALITY

Charles Forceville

1. Introduction

Multimodality research is on the rise, but discussions as to what exactly it is, what should count as a mode, and whether it is desirable or even possible to decide on an exhaustive list of modes are hotly debated issues. Consequently, this chapter cannot but have a highly provisional, rather un-handbook-like status.

What is uncontroversial is that multimodality, however defined, gained scholarly currency because of the growing awareness that the emphasis on language as traditionally studied in linguistics fails to do justice to the fact that communication often is not, or not exclusively, verbal. Even supposedly monomodal spoken and written language, after all, manifests meaningful dimensions that have long been ignored or downplayed. Written texts are characterized by visually reinforced markers such as CAPITALIZED HEADINGS, **bolding**, *italicizing*, indentation, and white lines. Nowadays, Word-wielding scholars realize they need to choose fonts and font sizes for their texts, i.e., they need to consider the visual dimension of their predominantly or exclusively monomodal verbal discourses (see, e.g., Van Leeuwen 2006; Stöckl 2005, 2014a). But in some types of texts, these visual features assume much more weight. Dada art and Concrete Poetry have played with the visual qualities of letters, and sometimes turned them into "things". Moreover, layout undoubtedly imposes a visual dimension on the written-text mode (e.g., Bateman 2008; Hiippala 2015), creatively exploited already in George Herbert's poems "The Altar" and "Easter-Wings" (both from 1633). Spoken language invites attention to a voice's timbre, pitch, and loudness, to facial expressions and body postures, and to accompanying gestures. Some scholars would therefore claim that *all* communication is multimodal—monomodal communication constituting, at best, a convenient theoretical construct. Consequently, there is a need for systematically researching non-verbal ways for conveying information, and for investigating information that consists of an ensemble of more than one meaning-making semiotic resource.

But that is about where agreement ends. Some of the studies currently presented under the banner of multimodality would in an earlier era have been labeled "semiotics"—and much of this work remains pertinent (see Chandler 2017; Stöckl 2014b). Semiotic approaches deserve credit for having initiated the study of non-artistic static visuals that take pride of place in multimodality studies. In fact, Barthes (1986 [1964]) anticipated multimodality research when he claimed that a

written text in a static word & image discourse either draws attention to aspects of meaning that are, albeit perhaps latently, already present in the image that it accompanies (i.e., the language *anchors* the image); or it presents information that complements dimensions of meaning in the image (i.e., the language *relays* the image). Refinements and alternatives have been proposed since (e.g., Unsworth & Clérigh 2009; see also Bateman 2014). Forceville (1996: 73) suggests that images can anchor written text as well as vice versa, and that the borders between anchoring and relaying are fuzzy. Moreover, since more than two modes can interact in meaning-making, the concepts of anchoring and relay deserve to be expanded beyond word & image relationships.

Most current work on multimodality has been inspired by Hallidayan Systemic Functional Linguistics/Grammar (SFL/SFG); multimodality is only beginning to be discovered by scholars working within cognitivist paradigms, specifically Conceptual Metaphor Theory (CMT). It thus makes sense to first present a short overview of SFL/SFG-related approaches (section 2), and then discuss CMT perspectives (section 3). Section 4 presents some further thoughts and challenges for future multimodality research.

2. Non-Cognitivist Approaches to Multimodality

Kress and Van Leeuwen's "social semiotics" approach is the best-known paradigm in multimodality research. Its most widely quoted distinction is that between the three "metafunctions" of communication: the ideational (pertaining to the relation between representations and their referents); the interpersonal (concerning how a sign is used communicatively between sender and receiver); and the textual (governing the rules that ensure coherence between the various textual elements) (2006: 42–43). In her edited volume, Jewitt (2014a) discusses two other major paradigms to multimodality. The first is a "systemic functional grammar (SFG) multimodal approach to discourse analysis" (Jewitt 2014b: 32); and the second is an interactional approach transpiring in work by Sigrid Norris (e.g., Norris 2012) and in "geosemiotics", whose essence can be captured by the view that "*the sign only has meaning because of where it is placed in the world*" (Scollon & Wong-Scollon 2003: 29, emphasis in original; see also Scollon & Wong-Scollon 2014). The chapters in Jewitt's handbook cover a wide range of topics, including color effects in video and film, the form of IKEA tables, pedagogical uses of multimodality, gesturing, the layout of (online) newspapers and websites, music and soundscapes, and the spatial design of museums.

Despite multimodality's popularity, the jury is still out on the thorny issue of what kind of entity or phenomenon should be accorded "mode" status. Several (hand)books on multimodality have been published (e.g., Kress & Van Leeuwen 2001, 2006; Baldry & Thibault 2006; Royce & Bowcher 2007; Ventola & Moya Guijarro 2009; Djonov & Zhao 2013; Jewitt 2014a; Jewitt et al. 2016; Machin 2014; Archer & Breuer 2015), but none of them comes up with an operationalizable definition; and they usually downplay the need to do so. Kress and Van Leeuwen, for instance, describe multimodality as "the use of several semiotic modes in the design of a semiotic product or event" (2001: 20). Kress (2010) comments that "instances of commonly used *modes* are *speech*; *still image, moving image; writing; gesture; music; 3D models; action; colour*" (2010: 28, emphases in original). Jewitt observes:

> Within social semiotics, a mode, its organizing principles and resources, is understood as an outcome of the cultural shaping of a material. The resources come to display regularities through the ways in which people use them. In other words in a specific context (time and place) modes are shaped by the daily social interaction of people. It is these that multimodal analysts call *modes* […] What is considered a mode and interaction between modes is inextricably shaped and construed by social, cultural and historical factors.
>
> *2014c: 22–23, emphasis in original*

The "mode-status" problem is rooted in conflicting ideas about what theoretical work a mode should be able to do. Social semiotics approaches seem to take for granted that *all* aspects of meaning-generating discourse need to be categorized as being, or belonging to, a mode. But accepting, say, visual elements such as color, size, angle, and lighting as modes runs the risk of ending up with an unwieldy long list that is moreover open-ended. Should we add gaze to the list of modes? Degree of realism? Materiality of the medium? And why not accord mode status to timbre, pitch, and loudness to the spoken-text mode? Or should we consider these "submodes" of the spoken-text mode? What about page layout? Interactivity?

Another characteristic of social semiotics approaches is that they strongly urge addressing political and ideological problems in the real world: "Social semiotics is interested in unveiling ideologies, social values, power roles, and identities as expressed in texts, together with how individuals actively maintain, reinforce, contest, and challenge them through their sign-making choices" (Adami 2017: 455). While it is undoubtedly important for humanities scholars no less than for (social) scientists to ensure that society at large optimally benefits from their insights, they need to be alert to the danger of achieving social relevance at the expense of methodological precision (Forceville 1999; Bateman et al. 2004).

Although sharing some assumptions and ideas with the approaches described above, more recently a body of work is gaining prominence that tries to incorporate insights from both semiotics and cognitivism. Exponents of this development are Bateman et al. (2017), Wildfeuer et al. (2019), and Klug and Stöckl (2016). The case studies in Bateman et al. (2017) are structured according to what the authors call "canvases" (rather than media), grouped together depending on the affordances and constraints of these canvases: (1) temporal, unscripted; (2) temporal, scripted; (3) spatial, static; (4) spatial, dynamic; and (5) spatiotemporal, interactive. Klug and Stöckl's volume focuses on the role of language in multimodal discourses in various genres. Wildfeuer et al. (2019) present contributions analyzing a wide range of data with reference to the question whether, and if so how, "multimodality" can/should develop into a discipline in its own right.

3. Conceptual Metaphor Theory Approaches to Multimodality

The main reason that CMT studies of multimodality have not spawned much discussion about the mode-problem is that hitherto they have by and large investigated only two types of multimodal discourse: discourses combining static visuals and written language; and spoken language accompanied by gestures. The mode-status of visuals, written language, spoken language, and gestures is relatively uncontested—but there has been little theoretical scrutiny of the issue. What seems clear, though, is that unlike the approaches briefly discussed in section 2, CMT-inspired work links mode as closely as possible to sensory perception. From a theoretical perspective, it would be convenient to postulate a one-to-one relationship between a mode and a sensory organ. But unfortunately we do not only see images, we also see written and signed language, as well as gestures—and Braille language through touching. We hear spoken language as well as music and sounds. Therefore a neat correspondence between mode and sensory perception is untenable. Unable to come up with a satisfactory definition of mode, Forceville (2006) nonetheless tries to optimally maintain the link between mode and sensory perception, suggesting the following modes: (1) spoken language; (2) written language; (3) visuals; (4) music; (5) sound; (6) taste; (7) smell; (8) touch; (9) gestures. Admittedly, this proposal, too, has drawbacks. For one thing, this is a bit of an odd list. For instance, my reason to grant gestures mode-status was that in CMT the study of co-speech gesturing played a pioneering role in broadening scholarship beyond an almost exclusive focus on conceptual metaphors' verbal manifestations. But, one can justifiably ask, if gestures are accorded mode-status, then why not the facial expressions that, like gestures, often accompany and reinforce emotional language? (McCloud 1993: ch. 2; Stamenković et al. 2018). The same could be argued

for body postures. In time-based representations such as (animation) film, moreover, "manner of movement" may convey vital information about a person's or fictional protagonist's character or mood. Consequently, I hereby tentatively propose to replace Forceville's (2006) gesture mode by a more inclusive mode that could be labeled "bodily behavior", and that comprises gestures, postures, facial expressions, and (manner of) movement—these latter possibly with "submode" status. Apart from this modification, I still counsel that the list of modes remain limited. This should be no problem if the scholarly community is content to consider mode as *one* meaning-generating aspect that always needs to be complemented by others. That being said, even a relatively short list is subject to debate. It remains to be decided, for instance, whether static images and moving images should be considered as constituting one or rather two modes, as Kress (2010: 79) advocates.

An advantage of a more or less finite list of modes would be that it helps contrast multimodality with monomodality. A discourse exclusively consisting of writing, or spoken language, or visuals, would thereby be monomodal. Even if we accept that the written-language mode always has visual features, too, these will be of less importance to linguists than to graphic designers. Similarly, there are graphic novels whose creators dispense almost completely with verbal text. Shaun Tan's graphic novel *The Arrival*, for instance is (virtually) monomodally visual. Cohn (2013, 2016) pushes the communicative affordances of visuals as far as one can by claiming there are entire *visual languages*. Lyric-less music would also qualify as monomodal by the criteria of the cognitivist perspective on modes sketched above.

The interest in multimodality among linguistics can largely be accounted for by Lakoff and Johnson's trail-blazing view that "metaphor is primarily a matter of thought and action and only derivatively a matter of language" (Lakoff & Johnson 1980: 153). Emphasizing that verbal metaphors are actually manifestations of underlying conceptual metaphors, Lakoff and Johnson pioneered CMT, and thereby paved the way for research projects focusing on non-verbal and partly-verbal expressions of conceptual metaphors. This initially led to two strands of multimodality in CMT research: co-speech gesturing (e.g., Müller 2008; Cienki 2017; see also McNeill 1992) and combinations of static visuals and written language (e.g., Forceville 1996; most contributions in Forceville & Urios-Aparisi 2009; see also Bolognesi's VISMET project at www.vismet.org/VisMet/).

But recent innovations in CMT expand the analysis of multimodality in various directions. In the first place, more attention is paid to metonymy, and to its interactions with metaphor (e.g., Mittelberg & Waugh 2009; Pérez Sobrino 2017; Kashanizadeh & Forceville 2020). Secondly, in the written-verbal-cum-static-visual realm, other genres besides advertising (e.g., Forceville 1996; Indurkhya & Ojha 2013) have begun to be researched, such as political cartoons (e.g., El Refaie 2003; Teng 2009; Schilperoord & Maes 2009; Bounegru & Forceville 2011; Negro Alousque 2014; Domínguez 2015; Lin & Chiang 2015; Abdel-Raheem 2019; Forceville & Van de Laar 2019); comics and graphic novels (Forceville 2005a; Szawerna 2017; El Refaie 2019). Metaphors used explicitly or implicitly in architectural design are investigated by Caballero (2006) and Plowright (2017). Van Rompay (2005) and Cila (2013) theorize metaphors in product design. Hidalgo-Downing and Kraljevic-Mujic (2020) explore how multimodal metaphors and other tropes are deployed creatively.

Moreover, some studies rooted in CMT have focused on discourses involving the musical mode (e.g., Johnson & Larson 2003; Zbikowski 2009; Górska 2010). A more rapidly growing body of work straddles CMT and cognitive film studies (e.g., Forceville 1999; Fahlenbrach 2016; Hidalgo-Downing & Kraljevic-Mujic 2013; Rewiś-Łętkowska 2015; Lankjær 2016; Coëgnarts & Kravanja 2012, 2015; Ortiz 2011, 2015; Müller & Kappelhoff 2018; Greifenstein et al. 2018; see also Forceville 2018), whereas within film the medium-specific affordances of animation are beginning to be explored (e.g., Forceville & Jeulink 2011; Fahlenbrach 2017; Forceville & Paling 2018).

4. Other Thoughts on Multimodality and Avenues for Further Research

Since "multimodality" is still very much in the process of inventing itself, let me end by sharing some ideas for research that may help its further maturation.

Mode, medium, genre, rhetoric. If one sticks to the relatively short list of modes presented above as cognitive-oriented, it is clear that while taste and olfaction also generate meaning, these modes have hitherto received little attention. Exceptions are work on wine-tasting notes by Caballero (2009) and Hommerberg (2011), and Plümacher and Holz (2007), who have dared to enter the field of olfaction. But it is virtually impossible to discuss mode without simultaneously taking into account the *medium* in which a discourse occurs. Of course medium is as knotty a concept as mode. While it is often restricted to the physical, material dimension of a discourse, a medium also evokes socioculturally, institutionally, and practically determined manners of *use*. Elleström (2010) exhorts analysts to distinguish between two aspects of media: "the origin, delimitation and use of media in specific historical, cultural and social circumstances", which he calls the "*contextual qualifying aspect*" (2010: 24), and its "aesthetic and communicative characteristics … the *operational qualifying aspect*" (2010: 25, emphases in original). Finally, meaning is strongly governed and constrained by *genre*. Arguably, genre is the single most important factor governing meaning-making in mass-communication (see Frow 2015). Some genres have been studied from a multimodal perspective, such as experimental literature (e.g., Gibbons 2012), children's literature (e.g., Moya Guijarro 2014), murals (e.g., Poppi & Kravanja 2019; Asenjo 2018), Mayan inscription (e.g., Hamann 2018)—but many others hitherto constitute unexplored territory. The threesome mode-medium-genre, in turn, requires analysis from the broader perspective of rhetorical *goals* that any multimodal discourse aims to realize (Stöckl 2019: 82).

Multimodal tropes. Cognitive multimodalists with an interest in rhetoric would do well to broaden their interest in metaphor to other tropes. A good project would be to revisit classical lists of tropes by Aristotle, Cicero, and Quintilian to help re-define them on a conceptual level—as Lakoff and Johnson (1980) did for metaphor. For metonymy such work is well under way (e.g., Barcelona 2000; Dirven & Pörings 2002; Ruiz de Mendoza Ibáñez 2000; Littlemore 2015; Kövecses & Radden 1998), and proposals for other tropes have been made by Gibbs (1993), while Burgers et al. (2016) demonstrate how tropes can co-occur. Clearly the expertise of rhetoric and argumentation scholars will be needed here as well. Thoughtful descriptions and definitions of the verbal varieties of such conceptual tropes could be the starting point for theorizing and analyzing them in other modes, and multimodally. In the visual and multimodal realm, some tropes besides metaphor and metonymy have already been subject to examination (e.g., Abed 1994; Teng & Sun 2002; Pérez Sobrino 2017; Cornevin & Forceville 2017; Tseronis & Forceville 2017; Poppi & Kravanja 2019).

Multimodality and interdisciplinarity. Irrespective of one's theoretical perspective on multimodality, analyzing multimodal discourse requires expertise in at least two different modes, as expressed in a more or less specific medium, and belonging to a more or less specific genre. For many scholars this means that they have to acquire expertise in a new field of study or discipline. It is an acceptable, even recommendable strategy to take whatever one has learned in one's own discipline about analyzing discourses or data (which in linguistics are typically verbal) as a starting point for approaching discourses and data in (an)other mode(s); but it is crucial that one also learns how the data in that other mode have been traditionally studied within their own discipline. In short, credibly studying multimodality requires true interdisciplinarity, and this costs blood, sweat, and tears.

Film as multimodal medium par excellence. Given that most post-silent films recruit at least six of the modes suggested above (visuals, written language, spoken language, non-verbal sound, music, and bodily behavior), one would expect film to be in the center of multimodality research. But it is not. There are several reasons for this. In the first place, with the exception of metaphor-oriented research, the disciplines of film and multimodality have hitherto rarely crossed (but cf.

Tseng 2013; Bateman & Schmidt 2014). Secondly, film scholars have mainly focused on the visual mode in their medium. Book-length studies on language in film, for instance, are relatively rare in film scholarship (but cf. Kozloff 1998, 2000), as are monographs on music and sound in film and other media (but cf. Cook 1998; Van Leeuwen 1999; Chion 2009; Mildorf & Kinzel 2016). Thirdly, given that modes usually operate conjointly, accounting for meanings that may be triggered by as many as six different modes is no simple endeavor. Addressing this challenge clearly requires both multimodality and film scholarship expertise.

Opportunities for translation studies. A field which increasingly touches on multimodal issues is that of translation studies, specifically where the latter focus on discourses in which one or more modes need to be communicated in another mode, as in subtitling and in audio description (AD) of paintings and films for blind people (e.g., Tuominen et al. 2018; Taylor 2019). The decision to expand or reduce certain elements in subtitles vis-à-vis the verbal source text may be influenced by the presence or absence of contextual information in other modes (visuals, sound, music). In AD, furthermore, other modes, such as touch, can be recruited (e.g., *feeling* sculptures or relief-versions of paintings). It is to be noted that *dubbing* (although strictly speaking pertaining to one mode, namely spoken language), too, has multimodal implications, since dubbing professionals need to aim for simulating (visually accessed) "lip-synchronicity".

Tools for qualitative and quantitative multimodality research. How does one model multimodal discourses so as to understand which modes partake in meaning-making, and how? Blending Theory/Conceptual Integration Theory (e.g., Fauconnier & Turner 2002) can help visualize how information in different modes is relayed (to use Barthes's term): Each pertinent mode can fill an "input space" and the relevant meanings of these input spaces are then integrated in the "blended space" (for an application, see Forceville 2013). A bigger challenge is the development of tools that enable systematical annotations, and thus make compatible, information in different modes, both within a single discourse and across discourses. This is particularly difficult if a discourse features modes other than language, because annotating tends to strongly favor the written mode, thereby forcing analysts to present their findings in artificial, laborious, and sometimes counter-intuitive formats (e.g., "translating" visuals, gestures, and/or music into written language). Moreover, motivated decisions must be taken as to what constitutes a good unit of analysis in a given mode. Robust annotation systems are also crucial for corpus research involving non-verbal modes. Several software tools have been developed for this purpose. One such (free) tool is Kaleidographic (Caple et al. 2018; see www.kaleidographic.org/); another, specifically developed for film, is Yuri Tsivian's Cinemetrics (www.cinemetrics.lv/). Promoters of the "Red Hen" project encourage scholars to use ELAN and share their annotations on the Red Hen website (e.g., Steen et al. 2018; see www.redhenlab.org/). A relatively young strand within multimodality research is testing people's eye movements when they look at visual or multimodal representations (e.g., Holšánová 2008, 2014).

Publication venues. There are more and more opportunities for publishing about multimodality. Most major publishers nowadays are likely to accept books that have multimodal content, but Routledge has a specific series devoted to it. In 2012 the journal *Multimodal Communication* was founded, whereas *Visual Communication* (since 2002) regularly features papers in this field—unsurprisingly, as discourses that are monomodally visual are much more rare than discourses in which visual information interacts with information in other modes. *Metaphor and Symbol* (since 1986) and *Metaphor and the Social World* (since 2011) regularly sport multimodal articles, and even the traditionally language-oriented *Journal of Pragmatics* (since 1977) nowadays carries multimodal studies. The art-oriented *Word & Image* (since 1985) also deserves to be mentioned. An added difficulty for all forms of publication is that, given the dominance of printed formats, only the written-verbal and the static-visual mode can be more or less unproblematically reproduced. It is to be expected that academic publishing will in the future further facilitate the inclusion of

original multimodal material (specifically: audiovisual fragments) via links to journals' URLs and/or authors' websites.

The need for an inclusive communication model. The manifold dimensions of multimodality outlined in this chapter may seem discouraging—whereas the influence of (sub)cultural identities on the interpretation of multimodal discourses has not even been addressed (see, e.g., Ibarretxe-Antuñano 2013; Adami 2015). It is important to bear in mind that, of course, well-formulated research questions usefully limit which dimensions need to be taken into account. It is furthermore vital that multimodalists take cognizance of more than one model, understand the strengths and weaknesses of each of them, and see through model-specific terms and categories that may hide underlying, data-oriented similarities. The possible confluence of insights emanating from different models would be very much helped by the existence of an all-encompassing communication theory. Arguably, the contours of such a theory exist in the form of relevance theory/RT (e.g., Sperber & Wilson 1995; Wilson & Sperber 2012; Clark 2013). RT has been developed from Grice's maxims of communication (e.g., Grice 1975), and is ultimately rooted in Darwinian principles of survival and reproduction. Its central tenet is that every act of communication comes with the presumption of optimal relevance to its envisaged addressee(s) (Sperber & Wilson 1995: 155–163). "Classic" RT almost exclusively pertains to spoken communication between two persons talking to each other in a *live* situation. In order to be useful for multimodal scholarship, RT needs to be expanded and refined so as to be capable of accommodating communication that is non-verbal and multimodal and addresses large audiences. The beginnings of this project are there (Forceville 1996: ch. 5, 2005b, 2014, 2020; Forceville & Clark 2014; Wharton 2009; Wharton & Strey 2019; Origgi 2013; Yus 2011, 2014, 2016).

Further Reading

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Forceville, C., & Urios-Aparisi E., (Eds.). (2009). *Multimodal metaphor*. Berlin: Mouton de Gruyter. (Presents the first ventures into multimodality in CMT.)

Jewitt, C. (Ed.). (2014). *The Routledge handbook of multimodal analysis* (2nd ed.). London: Routledge. (Showcases a wide range of social semiotics and SFL-oriented studies in multimodality.)

Klug, N. M., & Stöckl H. (Eds.). (2016). *Handbuch sprache im multimodalen Kontext/The language in multimodal contexts handbook*. Berlin: De Gruyter Mouton. (State of the art of semiotics-cum-cognitive analyses of discourses combining the verbal with other modes.)

Kress, G., & Van Leeuwen, T. V. (2006). *Reading images: The grammar of visual design* (2nd ed.). London: Routledge. (The most influential monograph in the field. Idea-rich but methodologically problematic.)

Related Topics

cognitive semantics; standard and extended conceptual metaphor theory; conceptual metonymy theory revisited: some definitional and taxonomic issues; concepts and conceptualization; cognitive pragmatics; cognitive poetics and the problem of metaphor; cognitive linguistics and discourse studies; culture in language and cognition; cognitive linguistics and translation studies

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41

FOUNDATIONAL ISSUES IN BIOLINGUISTICS

Kleanthes K. Grohmann and Maria Kambanaros

1. Introduction

Biolinguistics is … Well, what is it actually, and what is it not—a theory, an ideology, a framework? Biolinguistics is none of these, of course, but has been mistaken, misused, and misunderstood, often even on purpose or with intent. Much has been written about the origins of the term 'biolinguistics' and its substance, unabashedly generative by some and equally emphatically against by others. This chapter makes the attempt to selectively identify points of consensus, or at least mutual understanding, among researchers, perhaps even to make biolinguistics palatable to a larger group of scholars interested in language, cognition, and the mind/brain. In the spirit of full disclosure, we do this with a generative bias, not in small part due to the fact that one of us is a co-author of a widely used textbook on minimalist syntax (Hornstein et al. 2005)—yet any shortcomings, misinterpretation, or even factual errors committed along the way are based entirely on ignorance and not on malice.

Noam Chomsky has always been very clear that the scientific study of human language is essentially a part of human biology whereby linguistics explores the eponymous 'biological foundations of language' (Lenneberg 1967); see, e.g., Chomsky (1976) for the biological basis of language capacities. Likewise, there is also a strong cognitive basis to language, arguably made most explicit in Fodor's (1983) 'modularity of mind'. As such, "[l]inguistics is simply that part of psychology that is concerned with […] the cognitive structures that are employed in speaking and understanding" (Chomsky 1975: 160) as it is of the cognitive sciences more generally. Indeed, generative grammar has often been referred to as the "second cognitive revolution" (e.g., Pinker 1994: 21; Jenkins 2000: 2; Boeckx & Piattelli-Palmarini 2005: 448; Hinzen et al. 2011: 274; Roberts & Watumull 2015: 211)—with the first cognitive revolution going back to 17th- and 18th-century philosophy, ultimately the Cartesian approach (Chomsky 1966). And just as cognitive science can be fairly characterized as "the interdisciplinary study of mind and intelligence, embracing philosophy, psychology, artificial intelligence, neuroscience, linguistics, and anthropology" (Thagard 2005: ix), it is entirely obvious that "[t]he study of language is pertinent to many fields of inquiry" (Lenneberg 1967: 1).

Against the background of over seven decades of generative grammar (starting with Chomsky 1955 [1975]), this chapter cannot do justice to present and defend biolinguistics as the field it has grown into. There exists a long history of (generative) biolinguistics. Beyond Chomsky's (2009)

personal reflections and Boeckx and Grohmann's (2007) brief manifesto, see Di Sciullo and Boeckx (2011), Boeckx et al. (2012), Boeckx and Grohmann (2013), Roberts (2017), Trettenbrein (2017), and the respective volumes they introduce, among others. There are also monograph treatments, starting with Jenkins (2000), such as Hornstein (2009), Fitch (2010b), Samuels (2011), Balari and Lorenzo (2013), and Berwick and Chomsky (2016), to mention just a few, as well as textbooks such as Boeckx (2010) and Isac and Reiss (2013). And in the context of a handbook on cognitive linguistics, such a full-fledged and exhaustive presentation should not be the purpose of this chapter either.

Instead what we will do here is frame the biolinguistic research agenda within the context of what one may call the five 'foundational questions' and connect these beyond received wisdom. Here we take heart in sentiments expressed by Taylor (2007), for example, that in spite of many fundamental differences between generative and cognitive approaches (some to be addressed below), there is also a lot of polemics which divides and arguably even impedes collaboration (something that, e.g., Haspelmath 2020 picks up on to bridge further gaps). In a twist, we follow the Husserl-inspired suggestion that "we should get rid of all prejudices and confront the thing itself rather than what's behind it" (Wen et al. 2014: 159).

In the ensuing overview, we will not only cite a lot of sources (and miss many more), but also draw liberally on our (co-)authored writings on the matter (Boeckx & Grohmann 2007, 2013; Tsimpli et al. 2017; Grohmann 2019a, 2019b; Grohmann & Kambanaros 2019). After putting the core of biolinguistic inquiry on the table in the form of *five foundational questions* (section 2), we will revisit each one, split into the three best known (section 3), which may be the hardest to bridge across the front lines, and the two more recent ones (section 4), which may offer fruitful collaboration more easily. We will highlight research in language pathology as an example where generative grammar and cognitive linguistics can jointly contribute to a better understanding (section 5), and conclude with a brief outlook (section 6).

2. Historical Background and the Five Foundational Questions

Biolinguistics, in its most intuitive connotation, explores what Lenneberg (1967) termed the 'biological foundations of language'. As Lenneberg's book appeared around the time when generative grammar gained a firm standing in the study of language, it can be seen as a companion to the transformational grammar laid out in explicit detail (Chomsky 1965) and its philosophical footing (Chomsky 1966). In a nutshell, the first three questions were thus directly addressed, although not all equally explicitly (see also Jenkins 2013 and McGilvray 2013 on historical and philosophical retrospectives): What is the nature of language in the human organism, what are the mechanisms underlying language acquisition, and what are the relevant properties of language? The core of the familiar answers is denied wholesale in cognitive linguistics: a domain-specific faculty in the mind–brain, the Language Acquisition Device, and a domain-specific computational system encapsulating the autonomy of syntax, to be brief.

It may be worth considering these questions themselves in some more detail, however, as guiding questions for research into language as a species-unique capacity. Perhaps a slight reformulation without the accompanying rhetoric, which arguably contributed to the polemics Taylor (2007) dissected, allows different perspectives or at least appreciation. Along the way, we will cover a fair bit of history of biolinguistic research and related (pre)suppositions. This will include frequent reference to both generative and non-generative approaches to the scientific study of language. However, we will avoid capitalizing any models, approaches, or theoretical frameworks. Rather, we will do this from the joint perspective of the object of study: natural language as a species-specific mental phenomenon. This may allow the general term *macro-cognitive linguistics*, encompassing a variety of approaches, as opposed to the more framework-specific *micro-cognitive linguistics* (Wen et al. 2014).

As Boeckx and Grohmann (2007: 2–3) recap, the term 'biolinguistics' first appears as part of a book title published well before the advent of generative grammar. The book advocates (as the authors put it) a modern science of biolinguistics, whose practitioners "look upon language study […] as a natural science, and hence regard language as an integrated group of biological processes […] This group seeks an explanation of all language phenomena in the functional integration of tissue and environment" (Meader & Muyskens 1950: 9). The term 'biolinguistics' resurfaces some 25 years later as part of a report on an interdisciplinary meeting on language and biology (Piattelli-Palmarini 1974), attended by Salvador Luria, a microbiologist, and Noam Chomsky. It was organized by Massimo Piattelli-Palmarini under the sponsorship of the Royaumont Center for a Science of Man (see also Chomsky 2009).

Around the same time, Lyle Jenkins attempted to launch a journal entitled *Biolinguistics* and received support from pre-eminent biologists (support documented by three extant letters reproduced in the appendix of Boeckx & Grohmann 2007). The journal never materialized (a period well-documented in Jenkins 2000), but the concerns and issues discussed at the time did not disappear. As a matter of fact, all these issues, many of which incidentally were anticipated in Lenneberg (1967), came back on the agenda of linguists and other cognitive scientists.

Biolinguistics, the open-access journal that eventually materialized, was founded some 40 years after the above-mentioned core works from the mid-1960s on the premise that modern linguistic theory is still engaged in providing satisfactory answers to what we may call five 'foundational questions'. These can be formulated in abbreviated form as follows (from Boeckx & Grohmann 2007: 1), each dubbed a specific 'problem' intended to denote their intellectual origin or connection (cf. Boeckx 2009: 44–45; Leivada 2012: 35–36):

(1) *Five Foundational Questions of Biolinguistics*

1. What is knowledge of language? ('Humboldt's problem')
2. How is that knowledge acquired? ('Plato's problem')
3. How is that knowledge put to use? ('Descartes's problem')
4. How is that knowledge implemented in the brain? ('Broca's problem')
5. How did that knowledge emerge in the species? ('Darwin's/Wallace's problem')

The first three—the better known and original—problems were first coined by Chomsky: *Humboldt's problem* (Chomsky 1965), *Plato's problem* (Chomsky 1986), and *Descartes's problem* (Chomsky 1997). Each of these will be discussed separately in section 3 below. *Broca's problem* was named as such by Boeckx (2009), who is also often cited as the name-giver of *Darwin's problem*, although in the context of (bio)linguistics, Fujita (2002) already introduced it; however, the term "has been in frequent use, also outside the issue of language emergence" and "the earliest occurrence of the phrase is [arguably] found in Jewett (1914)" (Leivada 2012: 36, fn. 24). An alternative denotation would be *Wallace's problem* (Chomsky 2010). These two problems will be addressed in section 4.

Arguably the most important ingredient of answers to any of the foundational questions in (1) is the assumption that human language is made possible by a domain-specific faculty of language unique to *Homo sapiens*, which allows for the identification and investigation of an innate mental capacity ('knowledge of language'), sometimes referred to, and mixed up with (see Leivada 2020, which we will also return to), Universal Grammar (UG). The generative study of UG thus aims to "construct a biologically based natural science of language—of its development in the individual (growth) and the human species (evolution)" (McGilvray 2017: 77). As far as we are aware, these answers would be categorically rejected by all micro-cognitive linguists (that is, within the framework of *Cognitive Linguistics* and related derivatives, including *Construction Grammar*). One goal of the ensuing presentation is to put the foundational questions and possible ways of tackling them into a wider perspective.

For starters, the five foundational questions are couched within a larger framework of language design, larger than a full-blown UG under any name (see especially sections 3.1 and 4.1 below). With the rise of the minimalist program, much effort has been put into reducing the content of innate language-specific concepts. The interplay of nature and nurture in language acquisition and the role of cognition at large can be captured by the so-called 'three factors' (Chomsky 2005: 6):

(2) *Three Factors of Language Design*

1. Genetic endowment, apparently nearly uniform for the species, which interprets part of the environment as linguistic experience […] and which determines the general course of the development of the language faculty.
2. Experience, which leads to variation, within a fairly narrow range, as in the case of other subsystems of the human capacity and the organism generally.
3. Principles not specific to the faculty of language […]: (a) principles of data analysis that might be used in language acquisition and other domains; (b) principles of structural architecture and developmental constraints that enter into canalization, organic form, and action over a wide range, including principles of efficient computation […]

The first factor relates to the part of the human genome that is dedicated to language (say, UG), whereas the second factor expresses the epigenetic environment (introduced as 'Primary Linguistic Data' in Chomsky 1965). The third factor includes general principles of computation and cognition (not language-specific).

Generative research in linguistics has argued further that, at a suitable level of abstraction, the study of the language faculty can really be viewed as a branch of biology. (This is a point raised even before the term 'biolinguistics' became popular; cf. Chomsky 1976.) After all, the five foundational questions can be seen as variants of Tinbergen's (1963) four fundamental questions in his seminal contribution to the biology of animal behavior (Boeckx & Grohmann 2007: 2; for extensive discussion, see, e.g., Boeckx 2010; Fitch 2010b; Reboul 2017):

(3) *Four Fundamental Questions of Ethology*

1. What stimulates the animal to respond with the behavior it displays, and what are the response mechanisms?
2. How does an organism develop as the individual matures?
3. Why is the behavior necessary for the animal's success and how does evolution act on that behavior?
4. How has a particular behavior evolved through time? Can we trace a common behavior of two species back to their common ancestor?

Whereas biolinguistics may be characterized as the scientific inquiry into language that aims to highlight the commitment of the generative enterprise to the biological foundations of language vis-à-vis the faculty of language, the emphasis on the necessarily interdisciplinary character of such an enterprise should also allow for a more inclusive understanding. Boeckx and Grohmann (2007) associate a 'weak' and a 'strong' sense with biolinguistics. In its *weak sense*, biolinguistics means 'business as usual' for linguists, so to speak, to the extent they are seriously engaged in discovering the properties of grammar. In effect, then, this continues the research program Chomsky initiated in *Syntactic Structures* (Chomsky 1957). The *strong sense* of the term refers to attempts to provide explicit answers to questions that necessarily require the combination of linguistic insights and insights from relevant disciplines, some traditionally more related than others (such as evolutionary biology, genetics, or neurology).

However, one hope the *Biolinguistics* journal editors harbored from the outset (see also Grohmann 2015) is that the terms 'generative grammar' and 'biolinguistics' are *not* taken to be

synonyms, or the theoretical perspective espoused in 'Chomskyan' generative grammar the only valid underpinning of biolinguistic investigations. Yet, it is probably fair to say that the recent resurgence of interest in 'biolinguistics' is due in large part to the advent of the minimalist program in generative linguistic theory (Chomsky 1993 and subsequent work; see, e.g., Hornstein et al. 2005; Boeckx 2011b; Grohmann & Leivada to appear).

At the heart of the minimalist program lies the question of how much of the architecture of the language faculty can be given a principled explanation. Specifically, minimalism asks how well the engine of language meets design requirements imposed by the cognitive systems it subserves. Inevitably, linguists working in the context of the minimalist program are forced to address and sharpen questions of cognitive specificity, ontogeny, phylogeny, and so on, in order to even begin to understand the design requirements imposed on the language faculty—basically, (1)–(3) from above. This is not to say that previous generations of linguists were not interested in such issues. But in practice, biolinguistic issues had little effect on empirical inquiry into questions of descriptive and explanatory adequacy.

Likewise, it is important to stress that biolinguistics is also independent of the minimalist program. As, to use a classic reference, Eric Lenneberg's work made clear, biolinguistic questions can be fruitfully addressed outside of a minimalist context. But such a context may certainly facilitate, if not necessitate, inquiry into the biological foundations of language. From this perspective, linguistic minimalism is an approach to language that is largely independent of theoretical persuasion. It is thus an aspect of cognitive linguistic research that can be shared by virtually all existing frameworks in linguistic theory.

To reiterate: Biolinguistics does not require subscribing to the minimalist program, just as it cannot even be equated with generative grammar on the whole (see, e.g., Boeckx 2013b, responding to Jackendoff 2011). There are minimalist syntacticians who do not care much for essentially biolinguistic issues, there are generative linguists outside minimalism and within who do not, explicitly so, even if they assume a language faculty (e.g., Hoji 2016)—and there are also many linguists who are concerned with essentially biolinguistic issues, and even use the term 'biolinguistics' in their work, but who are anything but generative in their theoretical persuasion, from functional to other (micro-)cognitive approaches (such as Givón 1999 or Pennisi & Falzone 2016). In addition, there is a growing field of *biosemiotics* (e.g., Barbieri 2003; Hoffmeyer 2008), which not only "studies signs and sign systems in regard to all living organisms" (Kull & Velmezova 2015: 3); more recently, it connects directly to biolinguistic concerns (e.g., Augustyn 2013; Nöth 2015). For further critical and constructive reflections, see, among others, Fitch (2009), Barbieri (2010), Stamenov (2014), and Truswell (2014).

Cognitive linguistics, in Wen et al.'s (2014) 'micro' sense, does not denote a single or specific theory of language, "but rather a cluster of broadly compatible approaches […] in which natural language is studied as a mental phenomenon […] where cognitive refers to the crucial role of intermediate informational structures in our encounters with the world" (Geeraerts & Cuyckens 2007: 3–5). By now, the framework has grown into a multifaceted field of research from its inception starting at least with Langacker (1987) but originating in the aftermath of generative semantics from the late 1960s and early 1970s (cf. McCawley 1968 [1973]; Lakoff 1971; Lakoff & Ross 1976). Since the first textbook by Taylor (2003, originally published 1989), Cognitive Linguistics (i.e., 'micro-cognitive linguistics') has also seen an incredible influx of introductory books and collected volumes (see the Introduction to the present handbook for detailed presentation and sources).

The fundamental hypotheses underlying micro-cognitive approaches to the study of language may be summarized as follows (Wen et al. 2014: 156):

(4) *Fundamental Hypotheses of (Micro-)Cognitive Linguistics*

1. Language is not an autonomous cognitive faculty but a main part of cognition.
2. Human languages are a list of symbolic units in which forms are conventionally paired with meanings.
3. Meaning is what language is all about.
4. Meaning is conceptualization.
5. Knowledge of language emerges from language use.

These hypotheses are diametrically opposite to the generative position, something we will return to in our discussion of the five foundational questions (1) in sections 3 and 4 below. In (micro-) cognitive linguistics, there is no language faculty (4.1), the autonomy of syntax is rejected (4.2), the fundamental role of the computational system of human language is denied (4.3), a conceptual-intentional system does not play a role (4.4), and innate capacities are not assumed to deal with poverty-of-stimulus issues (4.5), to use some generative jargon here (to be put into perspective in the following).

Yet, macro- and micro-cognitive approaches are, ultimately, *cognitive*—with the crucial difference that in one approach, language is the product of a domain-specific faculty in the human mind/brain coupled with other factors (see, e.g., (2)), whereas in the other, "[t]he hallmark […] is the relationship between language and cognition, how humans conceptualize the world around them, how they create and represent meaning, and how this is reflected in language" (Siewierska 2013: 485). As Geeraerts and Cuyckens (2007: 5) put it, "the two approaches differ with regard to the epistemological role of natural language": Both concur "that there can be no knowledge without the existence of a mental representation that has a constitutive, mediating role in the epistemological relationship between subject and object" (Geeraerts & Cuyckens 2007: 5–6). It is just that "natural languages precisely embody such categorial perspectives onto the outside world" in micro-cognitive linguistics, whereas generativists hold "natural language as the object of the epistemological relationship, rather than as the intermediate link between subject and object" (Geeraerts & Cuyckens 2007: 6).

In this light, micro-cognitive linguistic approaches to language may want to reassess the five foundational questions (1) and the three factors (2) in order to feel comfortable with the term *biolinguistics*. The macro-cognitive linguistic perspective was sketched above for generative, perhaps even minimalist linguists. The following two sections will address each 'problem' listed in (1) from this perspective. But something needs to be said for a viewpoint of (micro-)cognitive linguistics, including other functional approaches, which concentrate on "language as a means of communication and how this communicative function has structured grammar both synchronically and diachronically" (Siewierska 2013: 485).

Language is not an autonomous cognitive faculty but a main part of cognition. If the (macro-) cognitive linguistic object of study understands natural language as a species-specific mental phenomenon, the five foundational questions of biolinguistics from (1), coupled with the fundamental questions of ethology from (3), may be phrased in more general terms to capture the investigation of any (mental) cognitive capacity (Boeckx 2010: 187):

(5) *For a given cognitive capacity X:*

- What are the rules and structures involved in X that are necessary to account for what we tacitly know about X?
- How does that capacity develop in the individual?
- How is X put to use?
- How is X implemented in the brain?
- How did X evolve?

Yet, from a micro-cognitive linguistic perspective, one might object to assigning language a (domain-)specific cognitive capacity, such as the faculty of language. In other words, from a generative viewpoint, (5) is nicely captured by Fodor's (1983) *modularity of mind* (see Fodor 2000 for a retrospective overview), where 'X' is such a module within the cognitive system—the language faculty. This faculty arises from the first factor (2.1), interacts with the linguistic environment through the second factor (2.2), and ties in with general principles of human computation and cognition via the third factor (2.3).

But there might be an alternative way of integrating Tinbergen's insights into a research agenda for a more inclusive biolinguistics paradigm, perhaps "Biolinguistics 2.0" (Boeckx & Benítez-Burraco 2014a), reflecting Boeckx and Grohmann's (2007) intention for the 'strong' sense of biolinguistics. Because the fundamental questions of ethology can be said to essentially concern *mechanism* (proximal cause), *function* (ultimate cause), *ontogeny* (development), and *phylogeny* (evolution), Reboul (2017: 2, 223) reformulates them in a more straightforward application to the study of language:

(6) *Tinbergen's Four Questions for Linguistics*
1. What are the mechanisms of language?
2. What are the functions of language?
3. What is the ontogeny of language?
4. What is the phylogeny of language?

Reboul does not pursue the analogy with the foundational questions (1), or problems, any further; or rather, she exploits these four questions in a different direction, which is in a sense already compatible with both macro- and micro-cognitive linguistic approaches. However, in (6), one can easily discern *Plato's problem* (ontogeny) and *Darwin's/Wallace's problem* (phylogeny). *Descartes's problem* would arguably pertain to the second question (functions), whereas *Humboldt's problem* forms a substantial part of the first (mechanisms)—except that it does not make explicit reference to an implicit domain-specific faculty, module, or organ. Finally, *Broca's problem* could be seen as the connecting link (again, an observation we will return to): It refers to the brain structures and processes required for implementation.

3. Generative Bread and Butter with a Cognitive Twist

Biolinguistics in the 'weak' sense may be viewed as the continuation of the 'traditional' generative research agenda. In the first modern book with 'biolinguistics' in its title, which subsequently kickstarted the emergence of this newly named field, we can read the following footnote, clearly relating the original three foundational questions to the Chomsky-inspired "second cognitive revolution":

> Chomsky often refers to the first question—what constitutes knowledge of language?—as *Humboldt's problem*, to the second question—how is knowledge of language acquired?—as a special case of *Plato's problem*, and to the third question—how is knowledge of language put to use?—as *Descartes' problem*, to highlight the fact that the modern study of these problems has a long and rich historical tradition. In what follows we will be primarily focusing on a part of the "second cognitive revolution," the modern study of biolinguistics; i.e., on work going back to the early 1950s.
>
> *Jenkins 2000: 2, fn. 3*

This section presents these three problems in some more detail. We will sketch a concise portrayal of each within the generative paradigm. This is somewhat lopsided in scope, with a long section

3.1 which introduces a number of terms relevant at a later stage. Along the way, we try to offer suggestions as to why or how these foundational questions may be relevant as well for other cognitive approaches to language.

3.1 Humboldt's Problem

Wilhelm von Humboldt (1767–1835) was an exceptional scholar who contributed immensely to many different fields of study, including anthropology, education, literature, philosophy, political thought, and statesmanship—and linguistics. Regardless of his views on (the nature of) language and its (intrinsic/extrinsic) philosophical underpinnings, his impact and insights on linguistics were tremendous. Chomsky (1965) first articulated Humboldt's problem as "a real understanding of how a language can (in Humboldt's words) 'make infinite use of finite means'" (Chomsky 1965: 8; von Humboldt 1836 [1988]: 70).

In Chomsky (1986: 3), Humboldt's problem became more finely articulated as the question: "What constitutes knowledge of language?"—basically (1.1) above. Of course, this question presupposes that there is some *knowledge* of language that we can talk about to begin with. Chomsky's introduction of the term couched within generative grammar points to an innate capacity to deal with language—to acquire it naturally, without instruction (Plato's problem), and to use it (Descartes's problem)—which connects to our brain circuitry (Broca's problem) and forms a part of human evolution (Darwin's/Wallace's problem).

Before addressing some core issues, let us provide an understanding of *language* in the generative sense. With Berwick and Chomsky (2016), we take "the Basic Property of language" to be that "a language is a finite computational system yielding an infinity of expressions, each of which has a definite interpretation in semantic-pragmatic and sensorimotor systems (informally, thought and sound)" (Berwick & Chomsky 2016: 1). It is this conception of language, as a computational system, that most crucially separates generative grammar from other approaches to human language; this 'Basic Property' will also play some role in the following.

We concur with de Vos (2015) that Humboldt's problem can be approached in two ways: (i) what "we, as linguists and cognitive scientists, know to empirically constitute language" (but see Wacewicz et al. 2020), and (ii) "what theoretical tools, systems and structures are required to explain those facts". Concerning *macro- vs. micro-cognitive* outlooks, "[w]hether these systems are considered to be 'knowledge of language' in an intrinsic or extrinsic sense depends on whether one considers them to be real or not" (de Vos 2015: 3). He correctly adds that

> [t]he differences between the theoretical clusterings characterized as 'generative' or 'functionalist' do not necessarily hinge on formalism vs functionalism, but rather on their commitments to a range of issues such as modularity, representation and empiricism/nativism which, in turn, can be seen as choices prompted by Humboldt's and Plato's problems.
>
> *de Vos 2015: 34*

The nativist view holds that this innate capacity, the genetic endowment for language, is UG. It constitutes the first of the three factors in (2), the initial state of the human language faculty, whose growth and further development depend on the other two factors as well. UG is neither a language nor a set of grammatical properties, it is "[t]he theory of the genetically based language faculty" (Chomsky 2017: 3). Admittedly, there has been considerable confusion among linguists and non-linguists alike, even among generative linguists, about these terms—about 'universal' in UG, about 'grammar' in both UG and generative grammar, about the nature of the language faculty, and so on (for useful clarifications, see, e.g., Trettenbrein 2015; Leivada 2020). A more amenable, bridge-building name for the starting point to address Humboldt's problem might be the "language-ready

brain" (Boeckx & Benítez-Burraco 2014b), which carries less terminological, theory-specific baggage.

In the generative paradigm, the human language faculty takes center stage. Originally, the term itself made clear that this is a domain-specific entity unique to the species, although this is less clear with Hauser et al.'s (2002) distinction into the language faculty in the 'broad' sense (FLB), which is not unique to humans, and the language faculty in the 'narrow' sense (FLN), which is. For early discussion, see the exchanges between Pinker and Jackendoff (2005), Fitch et al. (2005), and Jackendoff and Pinker (2005); for more recent expositions, see Fitch (2009), Miyagawa et al. (2013), Berwick and Chomsky (2016), and Miyagawa (2017), for example, but also, e.g., Tallerman et al. (2009), Christiansen and Chater (2015), or Wacewicz et al. (2020).

Much effort has subsequently been put in to give each of these faculties substance, including which aspects of human language must be part of FLN. The literature on both sides (from within generative linguistics and from more critical perspectives) is rich. The original suggestion was that what makes human language different from all other communication systems is recursion, in order to "make infinite use of finite means" (but see Fitch 2010a for clarifications). However, it is not only the computational property of recursion (which could be implemented in language through the structure-building operation 'Merge'), it is crucially the fact that these concatenated or merged building blocks of language are labeled (via the 'Labeling Algorithm'). We refer the reader to Hornstein (2009) for a very clear exposition of the issues and an overview of the literature, who develops a specific generative biolinguistic framework that links to the other foundational questions as well (see also Blümel to appear).

This falls within the (minimalist) architecture of the 'Basic Property', which connects the computational system of human language (which concatenates or merges lexical items, concepts, and formal features), to the interpretive and externalizing interface components, the conceptual-intentional system (feeding off an expression's Logical Form or LF for short) and the sensorimotor system (feeding off an expression's Phonological Form or PF), respectively. It is what we call the (generative) linguist's 'bread and butter'; the properties of this system can be studied without any further biological considerations (generative grammar without a biolinguistic commitment) or it can be continued to be investigated with an appreciation for the biological underpinnings of language (biolinguistics in the weak sense).

This approach seems to stand in stark contrast to (micro-)cognitive linguistics, where language is investigated, as Evans and Green (2006: 5) put it, "for its own sake" in an "attempt to describe and account for its systematicity, its structure, the functions it serves and how these functions are realised by the language system" (emphasis removed). Cognitive linguists assume further "that language reflects patterns of thought" and as such "offers a window into cognitive function, providing insights into the nature, structure and organisation of thoughts and ideas" (ibid.). Minimalist conceptions of the relation between language and thought may indeed differ here (cf. Chomsky (2007), with Hinzen (2011), for example, arguing that "the computational system of language […] equates with having a 'language of thought', with externalization being a derivative affair" (Chomsky 2007: 499). But ultimately, "[a]s cognitive enterprises, Cognitive Linguistics and Generative Grammar are similarly interested in those mental structures that are constitutive of knowledge" (Geeraerts & Cuyckens 2007: 6). The major difference breaks down to where these mental structures lie—in "natural language itself" or in "genetic endowment of human beings that enables them to learn the language"—and what kind of knowledge we are talking about (knowledge of the world vs. knowledge of language). This can be summed up as follows (Geeraerts & Cuyckens 2007: 6): "Whereas Generative Grammar is interested in knowledge of the language, Cognitive Linguistics is so to speak interested in knowledge through the language." Or, quoting Sperlich (2006: 59):

> Various schools of thought, such as functional and pragmatic linguistics, take much more store in communication as the driving force of language. Cognitive linguistics, although

closer to Chomskyan linguistics, claims that language competency derives more directly from general cognitive functions, thus not stipulating a separate interface such as Chomsky's UG.

By so doing, "language is assumed to reflect certain fundamental properties and design features of the human mind" (Evans & Green 2006: 5), as opposed to reflect the fundamental properties of a dedicated computational system of human language. Chomsky has always held that "one must deplore the common tendency to insist that the mechanisms of language must be special cases of 'generalized learning strategies' or general cognitive mechanisms of some sort" (Chomsky 1976: 23), even though at the time his resentment was mostly directed at psychologists. But this is not to say that such strategies and mechanisms do not exist or even play a role for language—they do, but in an ancillary way as co-opted resources. These are third-factor considerations (from (2.3) above). A point for collaboration between macro- and micro-cognitive biolinguists would be to investigate these computational and cognitive processes, whether held as the driving force behind language or as a third factor, in order to pinpoint the cognitive (neuro)biological basis of language *use* at least (see, e.g., Yang 2016).

Returning to the notion of 'knowledge of language', next we would like to sketch some additional notions which divide cognitive approaches to language and which will accompany us for the remainder of this chapter. The competence–performance distinction, introduced in Chomsky (1965), is an important concept in macro-cognitive linguistic theorizing, although in early micro-cognitive linguistics it had already been labeled as one of the "false dichotomies" (Langacker 1987: 154). It is intimately tied to Humboldt's problem as it explicitly refers to (one aspect of) *knowledge* of language. However, in micro-cognitive linguistics, "knowledge of language is derived from patterns of language use, and further, that knowledge of language is knowledge of how language is used" (Evans & Green 2006: 108), which makes it hard to address Humboldt's problem in these terms (but see below for minor suggestions).

Whereas *competence* refers to speakers' tacit knowledge of their language, *performance* reflects language understood as a set of actual utterances produced by native speakers. A distinct but closely related dichotomy (and equally rejected by micro-cognitive linguists as "false") is that of 'I-language' versus 'E-language', outlined presently. What we will not be able to elaborate here is that the competence–performance distinction gives further rise to the identification of 'grammaticality' or, more precisely, 'acceptability' of natural language data (see Leivada 2020 for recent reflections and relevant references).

In the hypothesized context, set up by Chomsky (1965) for illustration only, of the "ideal speaker–listener, in a completely homogeneous speech community" (Chomsky 1965: 3), speakers know their (speech community's) language perfectly. Thus, temporary conditions such as memory limitations, distractions, or production errors can be ignored for purposes of linguistic analysis in applying a speaker's knowledge of this language in actual productions; they are mere performance factors that are not relevant for grammaticality or acceptability. Linguistic competence denotes speakers' knowledge of their language or grammar (two terms often used interchangeably)—the abstract rule system they have mastered to produce and understand an infinite number of sentences, and to recognize grammatical mistakes and ambiguities.

In contrast to competence, linguistic performance is arguably not a well-defined notion—basically all aspects of speech production and comprehension, and perhaps even the making of judgments on grammaticality, well-formedness, or acceptability, that do not reflect the grammar are called 'performance' (see also section 3.3). Performance refers to language seen as a set of specific utterances produced by native speakers, for example, as encountered in a corpus. The utterances of performance will contain features irrelevant to the abstract rule system, such as hesitations and unfinished structures, arising from the various psychological and social difficulties acting upon the speaker (e.g., lapses of memory), or from biological limitations (such as pauses being introduced

through the need to breathe). These features must be discounted in a grammar of the language which deals with the systematic process of sentence construction, yet performance—or rather: the rejection of a distinction—does seem to be a prominent feature of micro-cognitive linguistics.

Within the Chomskyan paradigm of the human capacity for underlying, tacit linguistic knowledge, a more fine-grained distinction can be drawn between two distinct conceptions of the nature of language, the above-mentioned distinction of 'I-language' versus 'E-language'. Whereas *I-language* is used to refer to the language faculty (with 'I' denoting 'intensional', 'internal', 'individual'), *E-language* is "a covering term for a loose collection of theories that take language to be a shared social object, established by convention, and developed for purposes of communication" (Ludlow 2011: 45). It "is part of the outside world […] and it includes the kinds of things that a child might hear"—but E-language "does not reflect any single system"; after all: "No two children hear exactly the same things and no two people speak exactly the same way" (Lightfoot 2006: 12).

As Ian Roberts sums it up, "UG is a more general notion than I-language; indeed, it can be defined as 'the general theory of I-language' (Berwick & Chomsky 2016: 90)"—in full:

> The principal difference between I-language and competence lies in the concepts they are opposed to: E-language and performance, respectively. E-language is really an 'elsewhere' concept, referring to all notions of language which are not I-language. Performance, on the other hand, is more specific in that it designates the actual use of competence in producing and understanding linguistic tokens: as such, performance relates to individual psychology, but directly implicates numerous aspects of non-linguistic cognition (short- and long-term memory, general reasoning, Theory of Mind and numerous other capacities).
>
> *Roberts 2017: 7*

Thus, "the biolinguistic approach that focuses on the study of I-language, language as knowledge that is encoded in the human mind, and not on a notion of language as a corpus of texts or as a set of observed behaviors" (Isac & Reiss 2013: 91). That notion, E-language, is of course worthwhile studying—as is done successfully in, for example, corpus linguistics, discourse analysis, or sociolinguistics. However, it is irrelevant for discovering anything about *knowledge* of language. But from a micro-cognitive linguistic perspective, one might not be interested in knowledge of language and also reject the I-/E-language dichotomy, and identify other patterns provided by a language corpus. In this case, "what differs is whether these patterns are assumed to be rooted in biology or not, whether they are assumed to be dependent or independent of psychological states of individuals" (Isac & Reiss 2013: 70).

Isac and Reiss's explicit take on I-language as the relevant object of study ('I-linguistics') also has direct consequences for the place of biolinguistics as a field (see section 2 above):

> We thus adopt the term *biolinguistics* […] to emphasize the fact that we are studying a property of organisms, their language faculty. We are doing this in the same vein as studies of dolphin communication systems, or the navigational abilities of wasps—they all require complex computational systems that are constrained by the genetic endowment of the organisms that engage in the relevant behaviors. In this sense, linguistics is just a branch of cognitive ethology, the study of the computational systems that underlie animal behavior.
>
> *Isac & Reiss 2013: 55*

In sum, the first factor (2.1) assumes a species- and domain-specific genetic endowment for language (UG), equipping us with a language-ready brain, which is one aspect of how to address

Humboldt's problem. Generative biolinguists take this to constitute part of the human language faculty (FLN), but for language to develop and be used, other factors play important roles as well, including cognitive procedures. In (micro-)cognitive linguistics, the specificity of a faculty or module within the cognitive system dedicated to language is rejected. So here the language-ready brain may be conceived as the general cognitive system that, among other things, subsumes language as well. The relevant object of study is "natural language itself". Humboldt's problem is then just as relevant for micro- as for (generative) macro-cognitive linguistics, but the road to an answer looks different: "What is knowledge of language?" could be trivially replaced by "What is language?"—but perhaps a better way to approach this would be via Reboul's (2017) reformulation of Tinbergen's four questions for language as in (6.1): "What are the mechanisms of language?" The answers cognitive linguists will reach might look very different from generative efforts, but "elucidation of their functional motivation does not excuse us from actually describing grammatical constructions in full and explicit detail" (Langacker 2012: 7).

3.2 Plato's Problem

Plato (429?–347 BCE) was one of the most influential thinkers in the history of Western civilization. Whereas fundamentally less amenable to Cartesian philosophy than, say, his student Aristotle, his impact on the history of philosophy was nevertheless enormous (for linguistics, see, e.g., Katz 1984, and for a biolinguistic critique, Postal 2009). Plato's problem goes back to *The Meno*, in which "Socrates demonstrates that an untutored slave boy knows the principles of geometry by leading him through a series of questions, to the discovery of theorems of geometry. This experiment raises a problem that is still with us: How was the slave boy able to find truths of geometry without instruction or information?" (Chomsky 1988: 4). The original formulation of Plato's problem is thus this question (from Russell 1948): "How comes it that human beings, whose contacts with the world are brief and personal and limited, are able to know as much as they do know?" (Chomsky 1986: xxv, 1988: 3–4). With reference to language, it relates to "the problem of explaining how we can know so much given that we have such limited evidence" (Chomsky 1986: xxv).

Plato's problem, "the logical problem of language acquisition" (Baker 1979), is arguably the best known designated problem and lies at the heart of the nativist inquiry into knowledge of language (Chomsky 1986). In other words: "How do we come to have such rich and specific knowledge, or such intricate systems of belief and understanding, when the evidence available to us is so meager?" (Chomsky 1987: 33). The short version is formulated as (1.2) above. Rephrasing de Vos's (2015) two-pronged approach to answering Humboldt's problem, Plato's problem can also be approached in two ways: (i) what we know to empirically constitute the logical problem of language acquisition, and (ii) what theoretical tools, systems, and structures are required to explain those facts.

A staple in the history of generative grammar is the argument from the poverty of the stimulus (Chomsky 1978, 1980), that "our experience far underdetermines our knowledge and hence that our biological endowment is responsible for much of the derived state" (Lasnik & Lidz 2017: 221). The poverty of stimulus argument is "based on the observation that there is a significant 'gap' between what seems to be the experience facilitating first-language acquisition and the nature of the linguistic knowledge which results" (Roberts 2017: 28). It may even be traced back to at least Chomsky (1965) already. Lasnik and Lidz (2017) cite a passage from Chomsky (1955 [1975]):

> A consideration of the character of the grammar that is acquired, the degenerate quality and narrowly limited extent of the available data, the striking uniformity of the resulting grammars, and their independence of intelligence, motivation, and emotional state, over

> wide ranges of variation, leave little hope that much of the structure of the language can be learned by an organism initially uninformed as to its general character.
>
> *Lasnik & Lidz 2017: 58*

In other words, the input to the child is degenerate in two senses (Chomsky 1967).

> First, it is degenerate in scope: the input cannot provide evidence about all possible sentences (sentence–meaning pairs, sentence structures, etc.) that the child will encounter. Second, it is degenerate in quality: the input itself does not contain information about the kinds of representations that should be used in building a generative grammar of the language.
>
> *Lasnik & Lidz 2017: 222*

Over time, this has turned into more general learnability issues, questions of the nature of the learning problem for human languages. As cited by Roberts (2017), "Niyogi (2006) points out that, although children's learning resources are finite, the target is not completely 'unknown': it falls within a limited hypothesis space" and "it is an accepted result of learning theory that this must be the case: the alternative of a tabula rasa imposes an insuperable learning problem on the child" (Roberts 2017: 28). There are many more recent reassessments of the original poverty of stimulus argument and its modern issues. See, for example, Pullum and Scholz (2002) and various responses to the target article (in particular, Lasnik & Uriagereka 2002 and Legate & Yang 2002), but also Berwick et al. (2011) and Berwick et al. (2012).

The essence of the logical problem of language acquisition can thus be expressed through the poverty of stimulus. This would clearly be within the nativist purview. From a nativist-critical stance, arguably more widely shared by the (micro-)cognitive linguistics community, Bayesian learning algorithms have been exploited in order to account for child language acquisition (see, e.g., Tenenbaum & Griffiths 2001; Regier & Gahl 2003; Perfors et al. 2006 [2011]). These are critically reviewed by Lasnik and Lidz (2017) and especially Yang (2016). A new collaborative research agenda may thus turn out to be the originally planned subtitle of Brasoveanu and Dotlačil's (2020) very recent book: "Integrating generative grammars, cognitive architectures and Bayesian methods" (Brasoveanu & Dotlačil 2020: v); we leave this as food for thought.

Concerning the theoretical tools, systems, and structures required to explain poverty of stimulus-style arguments, the most important one is, of course, the biological endowment of human language, the first factor (UG). As Mobbs (2015) recapitulates, also in the interest of 'explanatory adequacy' (Chomsky 1964), "given the speed and accuracy with which language acquirers converge on grammatical systems despite insufficient (and widely varying) input, whatever is responsible must be 'biased or constrained in certain ways' (Hauser et al. 2002: 1577) to be able to account for it" (Mobbs 2015: 2); see also Rizzi (2017). Such biases and constraints come in various guises. These days, in the wake of a revised view of the faculty of language (since Hauser et al. 2002 and Chomsky 2005), they make up the second and third factors, that is, language-specific and non-specific systems, structures, and processes. In the past, a particularly fruitful approach was what gave rise to the so-called Principles-and-Parameters framework (Chomsky 1981a, 1981b; Chomsky & Lasnik 1993), especially as a way to address Plato's problem (Chomsky 1986). The basic idea is that parameters account for both, variation across languages and as the compass for children to navigate through the many options in their early development (for a comprehensive overview, see Huang & Roberts 2017; for brief remarks from today's perspective, see also Leivada 2020).

Biolinguistics, as Boeckx and Grohmann (2013: 1) introduce their handbook, takes as its focus of inquiry the remarkable ability, present in all children barring severe pathologies (see also section 5), to develop a grammatical system that is both incredibly plastic (if it were not, we would

not witness the linguistic variation we find among human languages) and surprisingly constrained (so many logically possible rules do not appear to be part of any human language). Although the environment in which the child grows up certainly plays a role in triggering the use of this capacity for language, it is equally obvious that the human child must be biologically equipped in a way distinct from other species if we are to explain how humans turn some of the noise around them into information. The nativist position sees this through the first factor, UG.

This chapter is not dedicated to language acquisition, so space does not permit extensive discussion. For a textbook introduction with the occasional reference to micro-cognitive approaches, see, e.g., Guasti (2017), but also Becker and Ud Deen (2020); for the opposite, e.g., Rowland (2014) or the classic monograph by Tomasello (2003). For short overviews from all sides of cognitive linguistics, see, among many others, Tomasello (2007), Ambridge and Lieven (2015), Crain et al. (2017), the chapters in Bavin and Naigles (2016) and Lidz et al. (2016), and several contributions to Hagoort (2019). Fairly recent overviews from a nativist biolinguistic perspective on central issues in the domain of language development include the range of evidence in favor of a 'language instinct' (Tsimpli 2013), the existence of a critical period for language acquisition (Meisel 2013), the issue of maturation in the context of language acquisition (Wexler 2013), and the impact of language on other cognitive systems ('executive control'), especially in the domain of bilingualism (Hernández et al. 2013; see also Leivada et al. 2020). It also contains proposals on how children may use the earliest input to figure out the properties of the language to be acquired (Millotte et al. 2013), and the range of options ('parameters') that biology seems to make available to the child during the course of language acquisition (see, e.g., Pearl and Lidz 2013; Thornton and Crain 2013; but also the earlier Crain and Pietroski 2001, the classic Pinker 1984, and the recent Fasanella and Fortuny 2016 who propose deriving linguistic variation from third factors, which may be a very good starting point for a micro-cognitive linguistic inspection of minimalist reasoning). All of these present important issues for child language research that need to be addressed from a micro-cognitive standpoint as well (although some have been already).

In sum, to address Plato's problem from a nativist biolinguistic (or macro-cognitive generative) perspective, all three factors from (2) above play a role: The child is equipped with an innate genetic endowment for language (first factor), receives language input in the form of Primary Linguistic Data from the environment to construct and revise hypotheses about the grammar of the language acquired (second factor), and applies computational and cognitive processes not specific to language (third factor). Perhaps a clearer connection to Plato's problem from a micro-cognitive perspective would be Reboul's (2017) more general reformulation of Tinbergen's four questions for language, as in (6.3) concerning the ontogeny of language, although it does not directly delve into underlying concepts or structures. From a micro-cognitive linguistic angle, it has been argued that "language acquisition often involves mechanisms and constraints that are not specific to natural language" (but see Yang 2016) and "to the extent that there do exist constraints on learning that are restricted to natural language acquisition, that these will at least to some extent draw on 'informational substance' supplied by cognitive systems other than the linguistic" (Geeraerts & Cuyckens 2007: 6).

3.3 Descartes's Problem

René Descartes (1596–1650) was a natural philosopher who contributed to mathematics, the natural sciences, and metaphysics. The foundations of 'Cartesian linguistics' (Chomsky 1966, after the *Discours* of Descartes 1637/1649) lie in the mind–body dualism. One aspect of this is the ability to use language, distinguishing "man" from "machines" or "beasts" (which even "men born deaf and dumb, and thus deprived of speech organs", can). Descartes's problem refers to "the ordinary use of language in everyday life, with its distinctive properties of novelty, freedom from control by

external stimuli and inner states, coherence and appropriateness to situations, and its capacity to evoke appropriate thoughts in the listener" (Chomsky 1988: 138). It is "the problem of accounting for 'the creative aspect of language use', one aspect of the more general problem of accounting for choice of action that is evoked by situations but not determined by them, as in ordinary, normal human behavior, linguistic behavior included" (Chomsky 1988: 35).

In its short form, we can express Descartes's problem as (1.3) above. The method applied by de Vos (2015) for approaching Humboldt's problem, which we then also did for Plato's problem, may not work as clearly here: The empirical nature of Descartes's problem is not as clear-cut, which then makes explanatory implementations more difficult as well. On the one hand, Descartes's problem is 'the production problem', as Chomsky put it, the problem of accounting for the creative aspect of language use, that is, the creativity aspect of language which is tied to a speaker's ability to use language with "coherence and appropriateness to situations" (Chomsky 1988: 138). On the other hand, Chomsky stated, "having nothing to say about it, I will put it aside, keeping just to the perception problem, or what is sometimes called 'the parsing problem'" (Chomsky 1997: 22), even though it presents itself as "[t]he central fact to which any significant linguistic theory must address itself" (Chomsky 1964: 7). This perception or parsing problem refers to how words are put together to form larger expressions, with the meaning they have, and the reverse (i.e., producing and comprehending linguistic expressions, in any modality).

Descartes's problem thus splits into a production problem (creativity of language use) and a parsing problem (language comprehension and production), where parsing and production are human performance tasks. Whereas Chomsky is less concerned with the first, he does sketch a route for the second, familiar from generative theorizing, although slightly differing across the frameworks over the past several decades: In short, "the hearer identifies words, and on the basis of their lexical properties, projects a syntactic structure as determined by principles of universal grammar and the values of the parameters" (Chomsky 1997: 26). Once again, this ties to Humboldt's question and at least the first factor, namely what is there to begin with. And it forms part and parcel of linguistic theory (mostly viewed from a syntactic perspective, although the other domains play a role, too, including psycholinguistics)—the generative grammarian's 'bread and butter' once more.

The technical details of the generative-transformational component of the grammar have evolved in many details since the original conception. For one, there is now a much improved approach to the old distinction between D- and S-structure in the minimalist architecture of the computational system. This distinction goes back to the suggestion, relevant to the parsing problem, that "we can formulate a second fundamental conclusion of Cartesian linguistics, namely, that deep and surface structures need not be identical. The underlying organization of a sentence relevant to semantic interpretation is not necessarily revealed by the actual arrangement and phrasing of its given components" (Chomsky 1966: 33). In addition, the predominant contemporary view is that the dedicated computational system centers around Merge, a binary operation which applies iteratively to the syntactic building blocks of the grammar (e.g., words, affixes, categories, features), contributing to the recursive computation of human language. A crucial aspect of Merge—which makes it different from a mere combinatorial operation that simply concatenates relevant objects (as in, say, arithmetic or music structures)—is that it also labels the syntactic objects it puts together. This so-called 'Labeling Algorithm' may thus form the unique ingredient of the human language capacity (see Hornstein 2009; Blümel to appear; and any modern minimalist textbook for details).

But where things get more interesting, both for biolinguistics at large and for micro-cognitive linguistics, is what goes on beyond. Bear in mind that generative grammar was set up as a model of language competence, although the computational system has been claimed to be optimally designed for performance systems (cf. Chomsky 1998 [2000], 1999 [2001]). Arguably the most prominent implementation of this view is Phillips's (1996) proposal that "the parser is the grammar" (Phillips 1996: 15; see also Phillips 2003): Syntactic structures are built from the left to the right, as opposed to top-down or bottom-up, and this incremental left-to-right system is

possibly the only structure-building system that humans have. One crucial aspect of Descartes's problem is the generativity and recursion of language (but see, e.g., Christiansen & Chater 1999 or Christiansen & MacDonald 2009 and many efforts from both sides of the macro-/micro-line). This can be approached theoretically with a focus on syntactic (macro-linguistics) or semantic properties (micro-linguistics), yet it inevitably refers back to the competence–performance distinction (cf. section 3.1). Among many other specific proposals, see, e.g., Knott's (2014) linking theoretical syntax with neural mechanisms in sensorimotor processing, or Trotzke et al. (2013), who show "that systematic properties of performance systems can play an important role within the biolinguistic perspective on language by providing third-factor explanations for crucial design features" (Trotzke et al. 2013: 1).

While this may deal with the parsing problem, Chomsky did mention "problems that can be formulated in terms of such notions as determinacy, randomness, probability distributions and input-output systems", but also held the view that "there is nothing very serious to say [at the level of theoretical understanding] about the production problem, except in very limited areas (e.g., the study of speech errors)" (Chomsky 1988: 35, 36). This may have changed, even in macro-cognitive approaches. Within the three-factor model familiar from generative minimalism (see (2) above), for example, third-factor considerations are clearly relevant to address the parsing problem, but may also be used for the production problem. For an explicit biolinguistic treatment, although with focus on communicative/pragmatic aspects and no direct reference to the three factors, see Reboul (2017). And it most certainly plays a prominent role in micro-cognitive linguistics (see several chapters in this handbook on relevant treatments).

Micro-cognitive linguistics may have more to add to this, however. Putting a strong explanatory emphasis on semantic and functional explanations, whether through focus on "language as a means of communication and how this communicative function has structured grammar" or "the relationship between language and cognition, how humans conceptualize the world around them, how they create and represent meaning and how this is reflected in language" (Siewierska 2013: 485). See also Christiansen and Chater (2016).

In sum, the generative-minimalist framework that embraces third-factor considerations seems to clash here with a 'third factor-only' view familiar from micro-cognitive linguistics. Descartes's problem is perhaps more directly relevant for micro-cognitive linguistics if we refer to Reboul's (2017) reformulation of Tinbergen's four questions for language instead, as in (6.2): "What are the functions of language?" Future biolinguistic collaboration should thus shed new light on what we take to be not as black and white as the authors would like us to have it: "Any time a particular phenomenon turns out to involve cognitive functioning rather than just formal syntax, the need to posit genetically given formal constraints on possible syntactic constructions diminishes" (Geeraerts & Cuyckens 2007: 6).

4. From Competence Model to Human Performance

Biolinguistics in the 'strong' sense comes out clearest in the last two foundational questions. These are possibly the most exciting problems to tackle. At the same time, they are also the hardest to address. This is because, on the one hand, there are clear obstacles along the way for both questions, more obviously so than for the first set of questions and independently of one's philosophical or theoretical persuasions (e.g., rationalist/empiricist, nativist/behaviorist, formalist/functionalist, or macro-/micro-cognitive). And on the other, cognitive (bio)linguists cannot tackle them on their own—they require multidisciplinary collaboration.

> Future research, presumably in close collaboration with neuroscience, will hopefully aid (bio-)linguists in determining the nature and properties of FLN/FLB and UG, as well as their role in evolution and development. In all likelihood, 'Darwin's[/]Wallace's problem'

> cannot be solved in isolation from 'Broca's problem' (Boeckx 2009), the question of how [the language faculty] is implemented neurally. Similarly, the classic (generativist) focus on UG will have to make way for far more encompassing developmental accounts (Lorenzo & Longa 2009) that attempt bridging the wide gap between genotype and phenotype.
>
> *Trettenbrein 2015: 6*

Next we will present these two problems very briefly. The brevity is owed in part to the fact that substantive engagement from a macro-cognitive perspective is relatively recent and, due to technological advances in the relevant areas, changing at a rapid pace. In addition, there are two contributions to this handbook that deal more specifically with micro-cognitive perspectives on the brain and neurolinguistics (Chapter 37) as well as on language evolution (Chapter 38), that is, considerable components of Broca's problem and Darwin's/Wallace's problem, respectively. Once again, we will try to reflect on why or how these foundational questions may also be relevant for other cognitive approaches to linguistics (and beyond).

4.1 Broca's Problem

Paul Broca (1824–1880) was the French physician whose research on the brains of aphasic patients led to the identification of a region in the frontal lobe that came to be known as Broca's area. Apart from many other research activities, he is credited with the first scientific explanation for the loss of speech production due to a left-hemispheral frontal lobe lesion, yet with language comprehension still intact. In a nutshell, Broca's problem refers to the question how (knowledge of) language is implemented in the brain, as in (1.4) above. Cedric Boeckx, its name-giver, is cautious, however: "It is about the brain–mind connection, and very few people have had good intuitions as to how to go about solving that mystery. You could call it Broca's Problem or Gall's Problem [after the German neuroanatomist and physiologist Franz Joseph Gall (1758–1828), founder of phrenology and pioneer in the study of the localization of mental functions in the brain], but it is very difficult to find insightful antecedents for this issue" (Boeckx 2009: 45)—an important point we will pick up in the summary.

At first glance, there may a trivial way in which to understand Broca's problem as not specifically macro-cognitive, or even generative: An answer to how (knowledge of) language might be implemented in the brain requires one to look closer at and into the brain, beyond the philosophical armchair investigations (whether, say, rationalist-dualist, Platonist, or empiricist)—important though they have been. Cognitive linguists are typically not the first group of scientists that come to mind (although see the reference to Piattelli-Palmarini 2013 in section 6), neurolinguists are often better equipped to do so, and collaboration with neuroscientists is imperative. One domain in which linguistic theorizing can play a role is in the interpretation of linguistic abilities directly linked to brain activity, structures, stimuli, and so on—especially in the context of language pathology (see section 5 below).

Boeckx and Grohmann (2013) introduce that part of their handbook which investigates the interplay between mind, brain, and behavior as including the nature of theoretically-informed experiments (Sprouse & Almeida 2013), working memory and language processing (Wagers & McElree 2013), modularity (Marcus et al. 2013), and language deficits and pathologies (Benítez-Burraco 2013; Friedmann et al. 2013). It also provides overviews with biolinguistic concerns on how basic properties of the core domains of linguistic inquiry (syntax, semantics, morphology, and phonology) may be implemented in the brain (Schlesewsky & Bornkessel-Schlesewsky 2013; Pylkkänen et al. 2013; Bornkessel-Schlesewsky & Schlesewsky 2013; Monahan et al. 2013). And it traces the fate of Broca's area and its use in relating mind and brain (Hickok 2013; see also the detailed Chapter 37 of the present handbook).

But the real crux of Broca's problem is the interplay of thought, mind, brain, and analysis. Classic keywords are the mind–brain dualism (Chomsky 1966), language of thought (Fodor 1975), the levels of analysis in cognitive systems (Marr 1982), and their modern counterparts (very selectively, this includes Fodor 2008; Gallistel & King 2009; Ludlow 2011; Berwick & Chomsky 2016; Kemmerer 2020; and many more). For starters, according to Berwick and Chomsky's (2016: 89–90) understanding of the Basic Property of human language:

> each language yields a digitally infinite array of hierarchically structured expressions with systematic interpretations at interfaces with two other internal systems, the sensorimotor system for externalization and the conceptual system for inference, interpretation, planning, organization of action, and other elements of what is informally called 'thought'.

More general than a specific linguistic implementation (whether on the macro- or on the micro-cognitive level) are Marr's (1982 [2010]) three levels of analysis for any information-processing system: computational, algorithmic, implementational. Unfortunately, "[o]ur general problem is that we understand very little about how even the most basic computational operations might be carried out in neural 'wetware'" (Berwick & Chomsky 2016: 51). One direction to explore further could be Gallistel and King (2009), but see, among others, Fitch (2017) for critical reflections and further references.

At the root of specific cognitive neurolinguistic implementations lies Embick and Poeppel's observation that "[t]he formal structures of linguistics and neurophysiology are disjoint"—the so-called 'Granularity Mismatch Problem', "a serious problem for those aiming to find brain correlates for the primitives of [the faculty of language]" (Hornstein 2009: 7, fn. 14): "Linguistic and neuroscientific studies of language operate with objects of different granularity. In particular, linguistic computation involves a number of fine-grained distinctions and explicit computational operations. Neuroscientific approaches to language operate in terms of broader conceptual distinctions" (Poeppel & Embick 2005: 104–105).

Coupled with the Ontological Incommensurability Problem, "the primitives of linguistic theory cannot be reduced to the fundamental units currently identified by neuroscience" (Poeppel 2017: 158). Arguably, "[w]hatever operations grammarians propose must ultimately be embedded in brain circuitry" (Hornstein 2009: 3), that is, "brain structures that compute simple operations" about which he adds: "A useful step in the direction of bridging the granularity problem would be for grammatical accounts to 'make use of computational analyses that appeal to generic computational subroutines' [(Poeppel & Monahan 2008: 83)]" (Hornstein 2009: 116). Some exciting and promising recent work in this domain of neuro-computational models for language comprehension (and production), some based on the influential dual-stream model (Hickok & Poeppel 2000, 2007), comes from Grimaldi (2012), Friederici (2017), and Murphy (2020), among others, and various chapters in Hickok and Small (2016) and Hagoort (2019), to mention just a few sources that address both macro- and micro-cognitive linguistic concerns.

In sum, theories of UG and the faculty of language (FLB and FLN) are changing (see especially Wacewicz et al. 2020) and will continue to do so. They will arguably "provide just one part of an encompassing 'theory of language', [so] we must assume that something is special about human language (and thus genome and brain), at the very least the way in which it conciliated a multitude of cognitive functions" (Trettenbrein 2015: 6). This connects directly to our earlier comment about Broca's problem fitting Reboul's (2017) reformulation of Tinbergen's four questions for language as an alternative way to phrase the question in a way that integrates micro-cognitive linguistic perspectives more easily. It may well be that "there is a lesson to be learned from the fact that we cannot really name that question, despite the fact that nowadays question [(1.4)] is taken in many circles to be the one on which the future of linguistics depends" (Boeckx 2009: 45).

4.2 Darwin's/Wallace's Problem

Charles Darwin (1809–1882) was an English naturalist, geologist, and biologist whose most important contribution was arguably a widely accepted theory of evolution (Darwin 1859), also in relation to (proto-)language (Darwin 1871). On analogy with Plato's problem, there is "the logical problem of language evolution" (Fujita 2007, 2009; cf. Boeckx 2009; Hornstein 2009; and, in a very different context, Christiansen & Chater 2008). This could be dubbed 'Darwin's problem', an identification popularized by Boeckx (2009, 2011a) but first used, as far as we know, by Fujita (2002: 166). A more recent shift refers to it as 'Wallace's problem' (Chomsky 2010; Bickerton 2014; see Levinson 2014; Berwick & Chomsky 2016; Hackett 2018; Terrace 2019), "after the codiscoverer of evolution by natural selection, Alfred Russel Wallace [(1823–1913)]. Wallace was the first to call attention to the difficulties for any conventional Darwinian, adaptationist account of human language, because he could perceive no biological function that could not already be met by a species without language" (Berwick & Chomsky 2016: 3). As they continue, "Wallace [(1869)] is generally regarded as one of his first public accounts of this difficulty, and presents his resolution of placing the origin of language and mind outside the realm of conventional biological Darwinism (although he envisioned a trans-Darwinian solution to the problem)" (Berwick & Chomsky 2016: 167, fn. 1).

Thus, Darwin's/Wallace's problem, as we refer to it from (1.5) above, addresses the question how (knowledge of) language emerged in the species. Much has been written on the evolution of language, too much to review here. Suffice it to say, evolutionary work within generative grammar has somewhat lagged behind. The interest is much more recent, certainly within the FLB/FLN view espoused in Hauser et al. (2002) and related 'early' work (see, e.g., Freidin & Vergnaud 2001). Berwick and Chomsky (2016) review some of the work, and so do Fitch (2010b), Reboul (2017), and Progovac (2019), among several others; for a variety of perspectives, see, for example, Gibson & Tallerman (2012), Lieberman (2015), or Pennisi & Falzone (2016). It is fair to say that non-generative work on language evolution has prevailed for the longest time, much of it even in (micro-)cognitive linguistics, with Tomasello (1999) being a prominent example (for an expert overview, see Chapter 38). This can also be witnessed in the long-standing *EvoLang* conference series (http://evolang.org), for example.

There are a range of issues relevant to the study of language evolution. To cite some biolinguistics-relevant literature overviews (Boeckx & Grohmann 2013: 3), one can think of the abilities of non-human vocal learners (Okanoya 2013) or the cognitive capacities of non-human primates (Zuberbühler 2013) outside *Homo sapiens* and human language, but also the potential use of fossil records to shed light on the evolution of language (Balari et al. 2013), the possible role of natural selection (Bickerton 2013), evolutionary issues concerning modularity (Marcus et al. 2013), and insights from computational modeling in the context of language evolution (Kirby 2013), among others—some with pertinent relevance for micro-cognitive linguistics and issues beyond generative concerns.

Within Chomsky's (2005) three-factors approach to the design of human language (see (2) above), the most promising route to bring macro- and micro-cognitive linguistic concerns together is arguably the third factor. Lohndal and Uriagereka (2017) consider the three factors in a larger perspective, and while focusing on the third, they observe that "[t]he three factors are more general than they might appear. Gould (2002: 118) discusses three similar factors that hold for organisms more generally", what he refers to as the 'adaptive triangle'. They continue:

> Whereas most contemporary scientists accept Dobzhansky's [(1973)] dictum that 'nothing in biology makes sense except in the light of evolution', the issue is to what extent this amounts just to natural selection […] the biolinguistic enterprise raises the question of

> the role of third factors, which Thompson [(1917/1942 [1992])] pointed out provide some fundamental explanations for the growth and form of biological entities (see [Freidin & Vergnaud 2001] for detailed discussion).
>
> *Lohndal & Uriagereka 2017: 118*

In the context of 'knowledge' of language and the human language faculty, Ferretti et al. (2018) put forth a suggestion that could bring macro- and micro-cognitive linguists one step closer as well: "[T]he idea of considering language as the broad FLB and not as FLN is a way to explain language functioning through more complex cognitive architectures than those postulated by classic biolinguistics"—especially as "many cognitive devices characterizing FLB are also present in nonhuman animals; the focus on FLB allows development of a continuistic view of language" (Ferretti et al. 2018: 221). They continue that, "[a]s highlighted by Wacewicz & Żywiczyński (2014), indeed, anything important regarding language origins is ascribable to FLB" (ibid.). See also the aforementioned Wacewicz et al. (2020) for critical reflections on FLB/FLN from an evolutionary perspective.

A large part of the discussion about the evolution of language thus touches on the theory of evolution itself, which comes out of virtually all sources mentioned in this section so far. Relating to both Darwin and Wallace, "the question of how natural selection could possibly account for the seemingly excelling intellectual, linguistic, and technological abilities of humankind" (Trettenbrein 2015: 5) is indeed puzzling; it also touches on more than Darwin's/Wallace's problem. Perhaps, as Trettenbrein (2015) notes, with reference to Fitch (2010b), "[a] small change with far-reaching consequences in the form of a minimal FLN could be the answer. An answer that, quite remarkably, implies that FLN might be non-adapted" (ibid.). A (not only micro-)cognitive response, already foreseen by Fitch (2010b: 22), would be that "no sub-component of the language faculty is truly unique" (emphasis removed), namely that FLN cannot be distinguished from FLB if FLN does not exist (see, e.g., Pinker & Bloom 1990 for early, and Pinker & Jackendoff 2005 for more recent discussion).

Or take the consideration that, if the language faculty is no older than 200,000 years or even less (Berwick & Chomsky 2016), human language would be "a very recent achievement in evolutionary terms" which would cast doubt on "any attempt to naturalize all the complexities that, for this reason, could not have ph[y]logenetically evolved, and should rather be the outcome of cultural processes" (Rosselló & Martín 2012: 16).

In sum, Darwin's/Wallace's problem is of utmost importance for both micro- and macro-cognitive linguistics. And whereas the road to an answer looks different again, it does not solely rely on the macro/micro-divide or hinge on nativism. A large role is played by theories of evolution (independently of language) and counts as relevant evidence for the emergence of language (communication, thought, cognition, computational abilities, and so on, as well as genetic evidence, fossil records, and other sources). Yet, once more, the major difference between Darwin's/Wallace's problem from (1.5) above and Reboul's (2017) reformulation of Tinbergen's four questions for language from (6.4) lies in 'knowledge of' language. To close this section, and our overview, with a final quote as we did before, we choose one that also connects to the previous sections:

> [T]he responsibility for the changes we are witnessing lies in the pressure brought to bear on explanatory adequacy (language acquisition) not only from evolutionary adequacy, since especially the programmatic paper by Hauser et al. (2002), but also from neural adequacy—if we can use this, to our knowledge, new term. Equivalently, one could say that the imperative approach to [Darwin's/Wallace's] and Broca's problems have paved the way for a new approach to the older Plato's problem.
>
> *Rosselló & Martín 2012: 16*

5. Towards a Comparative Biolinguistics

Drawing on previous work (Grohmann & Kambanaros 2016) and on our collaboration with Ianthi Tsimpli (Tsimpli et al. 2017), parts of which we reproduce and annotate here, let us highlight research on language pathology as an example to illustrate how generative grammar and cognitive linguistics can jointly contribute to a better understanding—and ultimately be of use beyond theoretical explorations.

A generative interest in language pathology would start out by positioning speech, language, and communication disorders within the context of UG and the innate species-specific language faculty, which is presumed to be invariant across individuals. As briefly reviewed above, it has shrunk over the years from a full-blown set of linguistic principles and parameters to a much smaller collection of properties, possibly as small as FLN, perhaps just containing the linguistic structure-building operation Merge (as part of or replaced by the Labeling Algorithm), which in turn derives the uniquely human language property of recursion.

The human faculty of language is further assumed to constitute a perfect system for language. Unfortunately, the human system or physiology does not always run perfectly smoothly in an optimal fashion. There are malfunctions, misformations, and other aberrations throughout. The language system is no exception. So, one important question that addresses the role of generative linguistics for language pathology, and guides much linguistically relevant work on impaired language, is: What can non-intact language tell us about the language faculty?

There is a direct relationship between the five foundational questions of biolinguistics and the study of language pathology. Whereas Humboldt's problem (i.e., question (1.1), discussed in section 3.1) is usually investigated from the vantage point of healthy, adult speakers, impaired language may offer further clues as to which aspects of language belong to the realm of tacit, underlying knowledge of language. Likewise, looking at developmental language impairments may provide more insights into Plato's problem ((1.2), section 3.2), in addition to studying typical language development. The exploration of Descartes's problem ((1.3), section 3.3) would gain tremendously from the examination of language-impaired populations, especially for a yet outstanding unified competence–performance model of language. Broca's problem ((1.4), section 4.1) is a very obvious concern for language pathology, especially impaired language that is the result of damage to the brain. And lastly, Darwin's/Wallace's problem ((1.5), section 4.2) is the question that not only opens up so much room for speculation in normal language; it also concerns language pathology that arises from genetic malfunctions, for example.

Pathology has long played an important role in the study of language in general. Generative linguistics has benefited greatly from insights gained through investigating language breakdown. That is, theoretical implementations in analyses of impaired language utilized and thereby buttressed linguistic theory; and at the same time, the types of impaired language found in different pathologies across languages and the patterns attested—as well as those not attested, often ruled out by the theory—were taken to be the direct workings of what is possible in human language and what is not (UG, principles and parameters, and so on). In other words, the linguistic study of language pathologies has long held one constant: the invariant human faculty of language.

Working on this assumption, data fed theory and vice versa. Contemporary research often holds that the leverage of investigations of pathological language and cognition should be raised, thereby steering the focus of what studying language pathologies can contribute to linguistic theory to finding out more about the underlying language faculty. Some central issues about such a contribution of research on language pathology to research on UG as "the theory of the genetically based language faculty" ('language-ready brain') are sketched below (see Tsimpli et al. 2017 for first answers to these questions as well as Leivada et al. 2017 and Grohmann et al. 2021). As evidenced

by much recent and ongoing research across many countries, languages, and pathologies, as well as different disciplines, these issues can be considered a compass for future research agendas.

- *Can pathology ever affect core language abilities or are only language-specific properties affected?* In other words, (macro-)cognitive linguists would be looking for evidence that fundamental operations such as Merge might be unavailable or otherwise impaired in any population with language pathology or, possibly more likely, that optionality and variability account for impaired language use instead. A (micro-)cognitive linguistic take on this question could approach it from the other end and try to account for all properties of (structural) pathological language through cognitive and computational processes instead.
- *Does language pathology affect linguistic competence or does variability in language use depend on accessing this knowledge due to affected mechanisms mediating language use?* This issue identifies the often noted tension between language-specific options versus working memory resources, for example. Within cognitive linguistics, this presents a non-issue, because the concept of 'competence' is rejected altogether; yet, the well-known discrepancies need to be accounted for.
- *Does pathology affect language use differently depending on the nature of the language disorder?* Associated with this question, research investigates whether issues of language knowledge vs. language use can be distinguished as a function of acquired versus developmental language disorders, for example. As far as we can see, this goes for any cognitive approach to language, whether formalist or functionalist, whether nativist-generative or micro-cognitive. For the former camp, this is especially a call for third factors, whereas the latter will arguably take this to be the only factor.
- *How can the contribution of language-external factors be disentangled from language-impaired performance in language pathology?* Assuming cognition (predominantly, executive control) and the environment (e.g., input frequency of a particular token, type, or structure) as relevant factors, multidisciplinary research in impaired language use receives additional attention beyond innate structures and mechanisms. This is a paradigmatic case for collaboration even among linguists from different theoretical persuasions, again in the spirit of combining rather than opposing insights into linguistic, cognitive, statistical, and environmental patterns and factors.

There is a growing body of work explicitly applying (micro-)cognitive linguistic insights into pathological language research. To mention one group in particular, Rosemary Varley's UCL Cognition and Grammar Lab investigates formulaic language in Alzheimer's disease (Zimmerer et al. 2016), collocations in non-fluent aphasia (Bruns et al. 2019), passivization in primary progressive aphasia (Zimmerer et al. 2014), or numeracy abilities in agrammatism (Varley et al. 2005), among other topics. Many of their conclusions are directly drawn from insights provided by (micro-)cognitive linguistics, although importantly, not blindly but with an open mind. Friedmann et al.'s (2013) contribution is another example of how using pathological language errors may inform theoretical cognitive-linguistic models of language breakdown, which by definition go beyond classic (generative) macro-cognitive concerns.

UG as the theory of the language faculty is distinct from the language faculty—in both its recent conceptions, FLB and FLN. Whereas only FLN is hypothesized to be unique to humans, FLB may also be construed so as to include pragmatic competence, for example (depending on one's exact view as to the nature of the conceptual-intentional system). Yet at the same time, as research on language and cognition with Christopher, the famous case of savantism, shows, much can be gained from multidisciplinary collaboration (Smith & Tsimpli 1995). In particular, findings from his learning British Sign Language confirmed multiple dissociations among language, thought, and

communication. These do point to a biological autonomy of language compared to other aspects of cognition (Smith et al. 2010; see Tsimpli et al. 2017 for a brief exposition).

The null hypothesis about the human faculty of language (i.e., FLN) is that it is invariant across the species. This perspective has recently been challenged in a proposal by Balari and Lorenzo (2015: 8), who argue for a *gradient* view of language, "an aggregate of cognitive abilities", rather than a language *faculty* as such. Such a conceptualization of the biological factors underlying language fits well into the current debates concerning the size of UG; see, for example, many discussions on Norbert Hornstein's *Faculty of Language* blog (http://facultyoflanguage.blogspot.com)—although most generative grammarians are unlikely to take to it. Yet it may be a good starting point for collaboration between macro- and micro-cognitive linguists (at least, this is how we interpret the proposal laid out in Balari & Lorenzo 2015). What this means is that the question of how language pathologies may inform UG and vice versa receives a new twist, too new to provide a learned overview. But it certainly gives rise to interesting new questions.

One such question concerns the neurobiological basis of language (see, e.g., Schlesewsky & Bornkessel-Schlesewsky 2013). Addressing this issue is obviously relevant for directly brain damage-induced language pathologies such as aphasias, independently of whether we assume a full-fledged faculty of language in the traditional sense ('big UG'), a highly reduced one ('small UG'), or the distinction between FLB and FLN; it is relevant for any 'language-ready brain'. However, the 'granularity mismatch problem' (see section 4.1) remains a formidable barrier to investigating the relationship of language breakdown and UG. That is, if we understand language pathology to inform research on UG, or the other way around, then trying to find the neural correlate for a possibly impaired Merge or Move operation will not be easy, to put it mildly (notwithstanding the exciting findings reported in Ding et al. 2016 or Jin et al. 2020; but see Frank & Christiansen 2018). As Grohmann (2013: 343) points out, this issue is also addressed by Boeckx (2010: 159), who actually turns the tables: "[U]ntil neurolinguists try to look for units that match what theoretical linguists hypothesize [note with references omitted], the conundrum we are in will not go away".

Regardless of the outcome of these developments, UG viewed from the perspective of language pathology may open new windows into FLN as conceived today, windows that may not have been available in earlier stages of theoretically informed language research. By highlighting some relevant linguistic profiles across selected language pathologies, one route for future research could be to refine these, collect more data, tie in impaired language more closely with current linguistic theorizing (and vice versa).

But there is also a larger message, directly relevant for this handbook chapter. A particular avenue of research that investigates the commonalities behind genetic, developmental, and acquired language pathologies more closely may be couched within what Benítez-Burraco and Boeckx (2014) refer to as *comparative biolinguistics* (used differently from Wildgen 2008). Looking at variation in language pathology allows us to consider in more depth "inter- and intra-species variation that lies well beneath the surface variation that is the bread and butter of comparative linguistics" (Boeckx 2013a: 5–6; see also Samuels 2015; Samuels et al. 2017), namely phenotypic variation such as different manifestations of language impairment and breakdown. Some relevant research that is emerging from this perspective can be found in Leivada (2015), Leivada et al. (2017), and Grohmann et al. (2021).

This is a larger research enterprise whose primary aim is to obtain distinctive linguistic profiles regarding lexical and grammatical abilities (see Kambanaros & Grohmann 2015), for example, concomitant with the goal to develop cognitive profiles across a range of genetically and non-genetically different populations who are monolingual, multilingual, or somewhere in between as well as populations with or without co-morbid linguistic and/or cognitive impairments as part of their genotype. (See published work by Maria Kambanaros and colleagues on lexical retrieval abilities for nouns and verbs in schizophrenia, multiple sclerosis, and work on sentence repetition of complex grammatical markers in seropositive males with HIV.) Whereas individual variability

is clinically crucial, population-based research can advance cognitive–linguistic theory through behavioral testing that acknowledges the brain bases involved. This will offer a unique opportunity to researchers to collaborate in fields as different as (but not restricted to) genetic biology, neurobiology of the brain, cognitive neuroscience, cognitive and developmental psychology, speech and language therapy or pathology, psycho-, neuro-, and clinical linguistics, and language development—as well as theoretical linguistics.

In addition, it may inform better about the underlying faculties involved, of particular concern, of course, the role of UG in pathology. Some recent work goes in this direction, if only partially, such as emergent perspectives on autism phenotypes (Bourguignon et al. 2012), the biological nature of human language and underlying genetic programs (Di Sciullo et al. 2010), genetic factors in the organization of language and the role of the two cerebral hemispheres (Hancock & Bever 2013), or the idea that syntactic networks may constitute an endophenotype of developmental language disorders (Barceló-Coblijn et al. 2015).

What can non-intact language tell us about UG? Looking at explicit accounts in the current literature, one could reach the conclusion that, despite decades of linguistically informed investigations into impaired language, not much progress has been made to address the fundamental, underlying issue: the nature of the human *faculty of language* (FLN) and its role in genetically damaged language, impaired language development, or acquired language disorders. It is fair to say that most of the discussion on pathological language suggests a resulting breakdown of language (possibly alongside speech and/or communication), not of FLN (the faculty) or UG (its theory). In the past, allusions to some deeper breakdown may have been made. However, to our knowledge there exists no research that aims to tease apart direct connections between language breakdown and FLN (hinted at in Leivada et al. 2017; see also Hinzen 2017 and follow-up work); when UG principles were evoked, it was typically as an epiphenomenal attempt of explaining independent findings.

6. Outlook

This chapter constitutes a serious reference guide to many issues, problems, and questions in biolinguistics, starting with a historical review and leading to, we hope, an appreciation for cognitive linguistics research of any stripe—what we referred to throughout as macro-cognitive (focusing on generative minimalism) and micro-cognitive (see Wen et al. 2014). We focused on an exposition of the five foundational questions for biolinguistics and discussed each in considerable detail, if of varying length.

One difficulty talking across fields, even if they are very close as is the case for macro- and micro-cognitive linguistics (natural language as a species-specific mental phenomenon), has to do with terminology. In a generative-dominated context of biolinguistics, this is doubly bad. First, by employing long-standing generative concepts, considerations, and consensus, non-generative cognitive linguists may shy away right from the start. It is hence important to put all relevant notions into the right context and then regroup (see also Adger 2019 for a recent example of doing this from an even wider angle); perhaps some ideas are not so bad after all or even find their counterparts across the fence upon closer inspection.

Second, even among macro-cognitive linguists, generative grammarians, and minimalist syntacticians (not to mention other domains, including at least semantics and phonology), terminological conundrums exist. Leivada (2020) took the applaudable task upon her to identify some of these, some quite fundamental, and point to disagreement in their use, wrong application of their denotation, and blurred conceptualization, or all of the above. These misused terms include Universal Grammar, the language faculty, parameters, language universals, features, and many more. And there are even more to come.

Other linguists struggle with terminology as well, including such apparently basic notions as a definition of ‘language’ (argued to be neither possible nor desirable by Wacewicz et al. 2020) or,

as Haspelmath (2020) recently did, finding the right label for linguists "who are interested in language structures" but who do "non-psycholinguistic, non-sociolinguistic research on languages" (suggesting 'structuralist' or 'structural linguist'). This is reminiscent of another trend in (generative) biolinguistic corners. "The theory of each individual language is called its Generative Grammar" (Chomsky 2017: 3), but many generative linguists are not as interested in the kinds of structural properties of individual, actual languages. Take, for example, Hornstein's (2013) proposal—not only meant jokingly— to distinguish by name "*linguistics* (or biolinguistics, with focus on [the faculty of language]) and *languistics* (with focus on what Felix [(2010: 71)] calls 'language data')—a state of affairs reminiscent of the distinction between biolinguistics in the strong and biolinguistics in the weak sense (Boeckx & Grohmann 2007)" (Leivada 2015: 94, emphasis added; see also Leivada 2014). Other labels such as 'biolinguists vs. philologists' for practitioners with or without a commitment to the nature of the human language faculty come to mind as well, even if as of yet unpublished (but see Boeckx 2009: 61, and a stronger formulation in an unpublished earlier manuscript that has circulated widely).

A larger issue that looms in an adequate dealing with the five foundational problems is that biolinguists can, and therefore should, inform research in completely different domains, such as human performance and variability, set the record right where misunderstood (cf. Smith et al. 2014), and support ongoing developments elsewhere. This may also include expanding conceptions of, say, FLB (e.g., Gagliano & Grimonprez 2015 for plants, but also the recently growing field of 'super linguistics'; cf. Patel-Grosz & Schlenker 2018). With the present chapter, and in the context of 'Biolinguistics 2.0' (Boeckx & Benítez-Burraco 2014a), we can now substantiate the earlier proclamation: "Biolinguistics is a fairly broad research program, and allows for the exploration of many avenues of research: formalist; functionalist; nativist and insisting on the uniqueness of the language faculty; nativist about general (human) cognition, but not about language per se; etc." (Di Sciullo & Boeckx 2011: 5). Ideally, such a biolinguistics research program can be institutionalized in the (near) future in one form or another. Piattelli-Palmarini (2013) recently penned a short past, present, and future of the field in which he also sketched a possible curriculum for a truly interdisciplinary biolinguistics study program.

We acknowledge that the preceding pages may read a little bit like the manifesto of a United Church of Everything. However, this need not be a bad thing. Language must be studied as a mental phenomenon alongside its social, cultural, and historical dimensions. The mental side, however, is distinctly bio-cognitive—hence, biolinguistics must be cognitive linguistics. The same cannot be said for other approaches to language, so "cultural-historical factors are not within the purview of the biology of grammar". This is a quote from Zaefferer and Poeppel (2010: 161), who rightly note:

> Although the biolinguistic axiom that "nothing in language makes sense except in the context of the biology of grammar" (Boeckx & Grohmann 2007: 3) is not necessarily incompatible with explanations based on cultural-historical factors, given that culture and history need a biological basis to live on, such a view would trivialize the notion 'biolinguistics' (cf. Koster 2009: 92).

As Boeckx and Grohmann (2007: 3) continued, though, which we still agree with: We are fully aware of the fact that the uniquely interdisciplinary character of biolinguistics poses difficult problems of communication and misunderstandings, but we feel that a growing community of scientists of diverse background, including linguists, evolutionary biologists, molecular biologists, neuroscientists, anthropologists, psychologists, computer scientists, speech–language pathologists, and so on, are slowly overcoming these challenges. Picking up on Taylor's (2007) theme, "only collaboration and mutual respect will make this type of research possible, to clarify issues, unearth new data, and answer some of the questions that will help us understand the nature of language, and what it is that makes us human" (Boeckx & Grohmann 2007: 3–4).

Let us close, then, with Massimo Piattelli-Palmarini, the scholar who gave the name 'biolinguistics' its modern meaning and one of the strongest advocates of interdisciplinarity in the field. The following words are from the preface to his enlightening volume *Language and learning: The debate between Jean Piaget and Noam Chomsky*, which captures one of the first truly biolinguistic events that brought together linguists, psychologists, philosophers, neurologists, and biologists to debate fundamental issues in, for, and about language:

> [I]t has become evident that the great interest in the book is accompanied by some frustration among nonprofessionals. Some questions have recurred, such as: "In the end, where does all this lead?" "What is really at stake here?" and "How does that relate to problems in my field?" Quite often, this "field" is simply the human condition.
>
> *Piattelli-Palmarini 1980: xvii*

Further Reading

Boeckx, C. (2010). *Language in cognition: Uncovering mental structures and the rules behind them*. Oxford: Wiley-Blackwell. (This textbook is the perfect introduction to biolinguistics without ever using the term; it gets quite technical at times.)

Boeckx, C., & Grohmann, K. K. (Eds.). (2013). *The Cambridge handbook of biolinguistics*. Cambridge: Cambridge University Press. (The first handbook in the field with the explicit aim to bring together a wide array of perspectives.)

Isac, D., & Reiss, C. (2013). *I-language: An introduction to linguistics as cognitive science* (2nd ed.). Oxford: Oxford University Press. (An excellent textbook on generative linguistics for non-specialists with an expressed biolinguistics understanding.)

Jenkins, L. (2000). *Biolinguistics*. Cambridge: Cambridge University Press. (The first monograph on the biolinguistics agenda using that term.)

Lenneberg, E. (1967). *Biological foundations of language*. New York: Wiley. (A classic text that grew out of very early interactions with the new generative grammarians; it also contains a detailed appendix by Chomsky.)

Related Topics

Biolinguistics ties in directly with Ch. 38 'Cognitive linguistics and language evolution' and Ch. 37 'Cognitive neuroscience of language', which elaborate essentially on Darwin's problem and Broca's problem, respectively, but also with Ch. 2 'Cognitive grammar' and more loosely with Ch. 4 'Multimodal construction grammar' and Ch. 15 'Concepts and conceptualization' as well as Ch. 8 'Embodiment'.

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THINKING ON BEHALF OF THE WORLD: RADICAL EMBODIED ECOLINGUISTICS

Sune Vork Steffensen and Stephen J. Cowley

1. Introduction

For Saussure, a foundational aspiration of linguistics was to define itself as an independent scholarly discipline: "The aims of linguistics will be […] to delimit and define linguistics itself" (Saussure 1992: 20). To achieve this overarching goal, Saussure conceived of linguistics as the study of a class of linguistic objects, subsumed under the term *la langue* (to which no other discipline had access). For Saussure, linguistics ought to be a science that, like physics, was values neutral. Subsequent linguists shared and extrapolated that view; for instance, in American structuralism the ideal linguist was often seen as a disinterested observer who did not understand the language under scrutiny. Even today, many linguists work in this tradition. While objectivity has much to recommend it, it is itself a value (Reiss & Sprenger 2017). In philosophy of science, science and its objects are today seen as social products (Hacking 1999) arising from the gathering of evidence and assessment of theories to depend on context-sensitive (not impersonal) judgments. Thus, rather than insisting on impersonal objectivity, many philosophers of science argue that there is no view from nowhere, that all observation is theory laden, and that facts and values are always entangled.

Beyond this well-established critique of classical objectivity, no degree of faithfulness to facts can account for *innovation*. While mechanistic models can use *what is* to conceptualize what will occur, this does not apply in the domain of the living. In an evolutionary scale, definitions are merely statements of *what has been so far*. Why is that important? As James Shapiro writes in the opening of his important book *Evolution: A view from the 21st century* (Shapiro 2011), "Innovation, not selection, is the critical issue in evolutionary change". The reason is that even at the level of the genome, living systems are self-modifying beings (Shapiro 2011) which, using techniques like natural genetic engineering, give rise to organically generated heritable change. Similar self-modification applies to the cultural world and what we usually think of as innovation. Unless one is a neo-Darwinian, none of this is surprising; after all, the capacity to change is itself adaptive. As a result, living systems manifest what appears as *directedness*: For the human observer, they adapt—or fail to adapt—in environments as they strive to secure their survival and well-being. Crucially, the *direction* of change is unpredictable; for researchers concerned with living beings, this lack of predictability means that—in contradistinction to macro-physics—life makes use of contingencies. In a messy world of nature, living systems explore what Kauffman (2000) calls the "adjacent possible" by finding ways of adapting that draw on biological and ecological mechanisms. Thus, in

exploring the adjacent possible, living systems actively enact their immediate future (Cowley & Markoš 2019).

These opening remarks on the directedness of adaptive and innovative living system serve two purposes. First, they emphasize that since linguistic phenomena depend on living human beings, modeling language as a self-contained symbolic system is counterproductive. Or more radically: Appreciating the embodied nature of language requires more than anchoring an alleged conceptual system in language users' experiential domains. Second, they function as an imperative to move beyond an ideal of science as a value-neutral practice based on CUDOS (Merton 1973), that is, values of Communism, Universalism, Disinterestedness, Organized Skepticism. This chapter unites these two concerns in presenting *ecolinguistics* from a novel perspective. In dialogue with the embodied tradition of cognitive linguistics, we turn to *radical embodied ecolinguistics*. Radical embodied ecolinguistics integrates a view of language as fully integrated with the kind of living systems we know as human beings, from which perspective the study of language is inseparable from the life sciences (Bang & Døør 2007), and a post-Mertonian understanding of science as preoccupied with such values as care for the living. As we will outline in the following section, the latter of these two concerns is shared with ecolinguistics in general, whereas the former is a more recent development in ecolinguistics.

After an overview of the development of ecolinguistics (section 2), section 3 is devoted to a critical examination of three different ways of approaching cognition: as disembodied/computational, as embodied/conceptual, and, particularly, as radically embodied/eliminativist. For each of the three positions, the linguistic counterpart is identified, whereby we juxtapose Chomskyan generativism and cognitive linguistics with radical embodied ecolinguistics. In section 4, we present radical embodied ecolinguistics around the key concept of the extended ecology. Finally, in section 5, we draw a number of practical, moral, and political implications of a radical embodied perspective.

2. Historical Perspectives

Like cognitive linguistics, ecolinguistics emerged in the 1970s in response to a Chomskyan understanding of language as a specialized mental-computational system that generates "sentences", rather as a computer software system generates marks on a screen. While cognitive linguistics opened a path for an embodied and experiential approach to language, ecolinguistics aspired to understand context in terms of interactions between a language and its social, psychological, and natural environment. The *locus classicus* for this move is made by the Norwegian-American linguist Einar Haugen:

> Language exists only in the minds of its users, and it only functions in relating these users to one another and to nature, i.e. their social and natural environment. Part of its ecology is therefore psychological: its interaction with other languages in the minds of bi- and multilingual speakers. Another part of its ecology is sociological: its interaction with the society in which it functions as a medium of communication.
>
> *Haugen 1972*

With Haugen, many ecolinguists became preoccupied with how languages co-exist in given areas, and with how social dynamics gave rise to loss of linguistic diversity (Crystal 2002). The latter is seen as resulting from a linguistic colonialism where coming to master the language of those in power becomes the *carte d'entrée* for the marginalized, a means without which access to the economic sphere is limited. Globalization, on this view, is the expansion of a feral economic system which impacts on language ecologies all over the world. Proponents of this line of thought have an explicit axiological perspective: "just as the extinction of any animal species diminishes our world,

so does the extinction of any language" (Hale 1992: 8). Among most proponents of this approach, the term 'ecolinguistics' has been largely superseded by 'language ecology', but it is nevertheless still dedicated to the same post-Mertonian axiological dimension that we have used in our outline of ecolinguistics above.

A similar post-Mertonian engagement appears in recent developments where ecolinguistics treats the study of language as a factor in environmental degradation. A guiding concern in this strand of ecolinguistics is how, in a matter of decades, human activity has transformed the living world: tens of thousands of species are becoming extinct, temperatures are rising, glaciers are melting, and, as sea levels rise, there is a growing lack of fresh water. The scientific consensus (IPCC 2014) is that human activity has set off global ecosystemic dislocations whose repercussions apply to all living beings, which—apparently to the surprise of many—include humans. A focus on trying to change how we conceptualize the unfolding ecological crisis is especially important to ecolinguists who draw on the work of the late Michael Halliday (1992). Indeed, he formulated another ecolinguistic *locus classicus*: "classism, growthism, destruction of species, pollution and the like […] are not just problems for the biologists and physicists. They are problems for the applied linguistic community as well" (Halliday 1992: 91).

Recent ecolinguistic work follows this line of thought by studying how language allegedly impacts on the natural environment. This development is partly due to, on the one hand, growing concern with environmental degradation and, on the other, efforts to attribute this degradation, at least in part, to linguistic dimensions of human activity. Prominent examples of this line of work include Arran Stibbe's books on how non-human animals are discursively constructed (Stibbe 2012) and on how human narratives give rise to specific ways of exploiting natural resources (Stibbe 2015). Indeed, the very interpretation of the natural environment as "a resource for human beings" contributes to such a narrative that is taken to be partly constitutive of the ecological crisis. Many striking examples appear in Fill and Penz's (2018) recent *Handbook of Ecolinguistics* where eclectic use is made of extant linguistic theories (e.g., systemic-functional linguistics, critical discourse analysis, and cognitive linguistics), often in combination with what Naess (1973) first termed an ecosophy (i.e., a position that values ecological balance). Yet, for 30 years, voices within the ecolinguistics community have argued that more is needed in pursuing ecological issues (Bang & Døør 2007; Finke 2014; Mühlhäusler 2003). Such critical lines of work include Mühlhäusler's (2003) adoption of Roy Harris's (1998) skeptical view on languages as fixed codes, Finke's (2014) model of language as a "missing link" between natural and cultural ecosystems, and also Bang and Døør's (2007) proposal that a dialectical ecolinguistics be used to connect up ideological, societal, and natural phenomena.

In a recent state of the art of ecolinguistics, Steffensen and Fill (2014) define the Haugen-inspired and the Halliday-inspired research strands as the *symbolic ecology* of language and the *natural ecology* of language, respectively. They also pinpoint two underdeveloped strands in the ecolinguistic literature: one deals with the *sociocultural ecology* of language and the other with the *cognitive ecology* of language. The former appeared in the early 2000s in work on second language acquisition and socialization (for an overview, see Kramsch & Steffensen 2008; Steffensen & Kramsch 2017). The ecological focus of this work used the multifaceted nature of language acquisition and socialization to argue for a methodological pluralism: "The premise that most clearly characterizes an ecological approach to language acquisition is that language behaviour always involves more than can be captured in any single frame or script" (Leather & van Dam 2003: 13). On the other hand, the *cognitive* ecology of language pursues bonds between language, people, and the living world. Turning from discourse and written texts, work within this strand focuses on how human behavior impacts on the living world. In emphasizing the cognitive ecology, authors such as Kravchenko (2016), Cowley (2014), Finke (2014), and Steffensen (2011, 2017) argue that ecolinguistics needs to clarify how human agency is reciprocally coupled with language and its

practical and social extensions. The emphasis on human agency traces language to its entanglement with human living and thus obviates a need to seek 'relations' between 'language' and 'environment' as if they were separable entities (Steffensen 2017). Rather, once language is seen as part of human living, it ceases to be seen as separable from the wider living world.

3. Critical Issues and Topics

Radical embodied ecolinguistics rejects the modus operandi of structural and post-structural perspectives on language. For the same reason, it rejects methods that depend entirely on linguistic analysis. Rather, it treats human ways of perceiving as pivotal to how people engage with their surroundings and, by so doing, turns to how language co-evolves with cognition, behavior, and environmental constellations. On that view, as part of living, language must be seen in terms of *symbiosis*, not *symbols*. The critical issue becomes that of *how* language is grounded in the biomechanisms of flexible, adaptive human behavior. As these mechanisms are central to cognitive science, we will devote this section to a comparison between how cognition and language are theorized in computational and (weakly) embodied traditions (section 3.1) and in radical embodied ecolinguistics (section 3.2).

3.1 Grounding Language in Cognition I: Computational Cognition and Cognitive Linguistics

Classic cognitive science builds on von Neumann's computational architecture. Having grasped how computational systems produce symbolic output that depends on processing symbolic input, many adopted the assumption that an organism could be considered "to consist of effectors, receptors, and a control system for joining these" (Newell, Shaw & Simon 1958: 151). On that view, behavior can be exhaustively traced to control systems whose *programs* compute definite sets of *primitive information processes* that operate on symbols. In the von Neumann architecture, these symbols are stored in memory and/or are translated from sensory input from receptors. In turn, they allow for translation into behavioral output via the effectors. Simply, observable, external behavior is taken to be determined by internal computational processes.

In linguistics, the framework finds expression in Chomsky's distinction between I-language and E-language (Chomsky 1986). Chomsky attempts to "explain" language by using explicit statements of how, in principle, strings of symbols might derive from constituents whose operations can be described by formal rules. Chomsky thus approaches language in the same way as physicists have constructed "abstract mathematical models of the universe to which at least the physicists give a higher degree of reality than they accord the ordinary world of sensations" (Steven Weinberg, 1976; cited in Chomsky 1980: 217). The main evaluation criterion for generativism is therefore the principle of economy. By way of contrast, one can consider the program which is presented by the outstanding myrmecologist and sociobiologist, E. O. Wilson, in his 1998 book *Consilience* (Wilson 1998). Wilson invokes an "organized, systematic enterprise" that falls into three parts: (1) gathering knowledge of the world; (2) condensing the knowledge into testable laws; and (3) condensing the knowledge into testable principles. Wilson specifies that the laws/principles can be evaluated in terms of repeatability, economy, mensuration, heuristics, and consilience (i.e., "explanations of different phenomena most likely to survive are those that can be connected and proved consistent with one another").

With its emphasis on descriptive economy, generativism brings little new understanding to fields like child development ('language acquisition'), neuroscience, or evolutionary theory. Simply, it provides no new heuristics. Likewise, as a priori or logical constructs, neither Universal Grammar nor Merge lend themselves to consilience with anything beyond the field of grammar. By contrast,

we emphasize ways of condensing knowledge because a more *consilient* explanation of language needs to link ecological and biological facts with models of human existence and, by so doing, offer a more *resilient* explanation.

Towards the end of the 1970s, symbolic views of *representations* (i.e., neurogenic entities that function as pictures of the external world) were gradually eclipsed by conceptual models. Language was traced to an interplay between bodies and their physical and social environment (Lakoff 1987: xiv), and as had been proposed by Eleanor Rosch in the early 1970s, categorization and thought were traced to experiential prototypes (cf. Lakoff 1987: 39–67). As a result, the symbolic model of mind was eclipsed by neural network modeling, connectionism, and parallel distributed processing. As readers of this book very well know, the linguistic version of this change in cognitive science was cognitive linguistics.

Cognitive linguistics continues the quest of explaining language in terms of the human mind (Lakoff 1987; Langacker 1987). By focusing on concepts, change was limited by retaining both the traditional mind-brain focus and also the structuralist view of the linguistic sign as an entity that "associates a semantic representation of some kind with a phonological representation" (Langacker 1987: 11). In this way, a neat parallel is drawn with Chomsky's (1995) constructs of "Logical Form" and "Phonetic Form". Likewise, Langacker uses structural models of linguistic levels or ranks to describe grammar in terms of "patterns for grouping morphemes into progressively larger configurations" (Langacker 1987: 12). On his view, grammar is "inherently symbolic and hence meaningful" (Langacker 1987: 12). Cognitive linguistics looks beyond formalism by stressing mind's role in experience and action. Later, diverging from Lakoff, Langacker, and others, Raymond Gibbs moves more strongly against computational models of mind. He writes:

> People's subjective, felt experiences of their bodies in action provide part of the fundamental grounding for language and thought. Cognition is what occurs when the body engages with the physical, cultural world and must be studied in terms of the dynamical interactions between people and the environment. Human language and thought emerge from recurring patterns of embodied activity that constrain ongoing intelligent human behavior. We must [therefore] *seek out the gross and detailed ways that language and thought are inextricably shaped by embodied action.*
>
> *Gibbs 2006: 276; our italics*

Thus, rather than rely on formalization, Gibbs seeks explanations that draw on felt experiences that arise from bodies in action. By extending concept-based views of cognition and language, he pictures 'embodied action' as shaping 'language and thought'. However, he leaves aside how people integrate the cultural, phenomenal, and bio-mechanistic with language and thought (let alone action). Gibbs fails to ask how embodied action draws on language and thought (qua cultural products) because he ascribed perception and action to a 'mental' system. In spite of his focus on experience, Gibbs retains an organism-centered view and, thus, an input-output model of cognition. On this view, speaking, acting and thinking are products of an inner mind. However, the model can be critiqued as depending on unexplained *mental gymnastics* (Chemero 2009). Like many approaches to embodied cognition, Gibbs is thus silent about how living systems deal with contingencies, adapt, develop flexibility, and offer an appearance of directedness (for a third person observer). He offers no account of event-based changes, sudden decisions, courses of action, or chains of happenings that, at times, set off historical revolutions or ecosystemic transitions.

To overcome this shortcoming, rather as the generative program adopted computationalism and cognitive linguistics turned to embodied cognition, radical embodied ecolinguistics builds on a view that can be traced to William James and what Chemero calls *American naturalism*. On such a view, experience arises as organisms engage directly with the world. Chemero terms this

program *radical embodied cognitive science* (Chemero 2009). In the remainder of this section, we consider how radical embodied ecolinguistics deals with the critical matter of how—via a radical understanding of cognition—language contributes to the world of the living.

3.2 Grounding Language in Cognition II: Radical Embodiment and the Language Sciences

Radical embodiment is an umbrella term for approaches to flexible, adaptive behavior that make no appeal to a causal system that manipulates inner content (whether conceptual or representational). In Chemero's metaphor, appeals to mental gymnastics are to be replaced by methods that examine how organisms engage directly with a world in which they have co-evolved. As noted, this view has its roots in the work of William James and, later, how James Gibson and his followers developed this legacy. There are, however, many traditions that grant importance to how social experience contributes to human living as people manage activity in an artifact-rich world of institutions and human practices. These include:

- Soviet work concerned with language, activity, and functional systems (e.g., Vygotsky, A. Leonti'ev, and N. Bernstein).
- Views of phenomenology which emphasize embodiment (including traditions that build on Heidegger and Merleau-Ponty).
- Theories that grant importance to social practices (including systemic functional linguistics, actor network theory, and distributed cognition).
- Bio-cognitive, enactivist, and other work that emphasizes how living beings construct what they experience as a familiar world.

As applied to humans, radical embodied cognitive science can integrate these traditions by building on two methodological claims: "Embodied Cognition is to be explained via a particular set of tools T, which includes dynamical systems theory". Further, "the explanatory tools, T, do not posit mental representations" (Chemero 2009: 29). In bringing these to the language sciences, radical embodiment can be integrated with ecolinguistics.

During the 1980s, debates between Jerry Fodor and Daniel Dennett persuaded many that, far from being *a priori*, mental content is derived (see Dennett 1994). The sense or meaning of perceiving and acting uses, not 'original intentionality' but, rather, a history of engaging with the world. In Dennett's work, however, human use of derived content was ascribed to a 'serial virtual' language machine that, by hypothesis, was installed in the brain (Dennett 1993). However, the price for postulating such a virtual machine is that, in Chemero's terms, it requires powerful mental gymnastics. Whereas many in the last 30 years have come to regard embodiment as the basis for mental content, the crucial move in Chemero's approach—the one that makes his view radical—lies in focusing on methodology. Effectively, his epistemic stance uses a methodological imperative that traces what people think, say, and do to a multi-scalar history of dynamic coordination. Unlike Gibbs, he avoids the metaphysical view that cognition is embodied by proposing that it be understood by drawing on a set of tools T that eschew appeal to mental representations. Models presupposing mental content (mental gymnastics) are to be superseded by tracing cognitive powers to interactions between observable systems and their parts. What goes for cognition generally, goes for language too. In radical embodied ecolinguistics, therefore, the focus falls on ways of stabilizing non-linear dynamical change. This is the basis for both knowledge gathering and seeking to establish testable principles.

As goes almost without saying, language, and especially language as it appears in texts, has a salient symbolic aspect. *Contra* Saussure, however, the radical embodied view posits that 'content'

evolved from a sensory-motor history. Rather than ascribe understanding to *langue* or a 'language faculty', its basis lies in how coordination evokes material relationality. Content draws on skilled perception or: "What we perceive […] is not the environment alone. It is, instead, the relation between the perceiver and the environment" (Chemero 2009: 141). Skilled perception links a history of living with what Eleanor Gibson terms the *education of attention*, or, "learning which variables to attend to and which to ignore" (Adolph & Kretch 2015: 131). Since perception is a relational achievement, coming to distinguish two near-identical signals (say, the graphemes 'b' and 'd') or two similar articulatory gestures (say, sounds represented by [t] and [d]) depends on aligning perceptual skills with perspectives common to a population (Steffensen & Harvey 2018). On the radical embodied view, the human world is rich in potentials that derive from how each observer finds ways of perceiving that are saturated by language. Accordingly, there is no need for mental content. Given how people connect skilled perception with linguistic and other means of controlling ways of attending, some of the world's resources become collectively known. As these are unhidden, a person gains perceptual, actional, and linguistic skills.

Such a view not only avoids mental content. By so doing, it further obviates the need to ascribe 'reality' to linguistic objects. Rather, like life and cognition, language is multi-scalar activity that manifestly spreads in space-time. In that voices connect bodies, social institutions, artifacts, and living systems, the radical embodied view has no need for mental states that encode 'objective' entities: brains deal with neither forms nor content. Linguistic focus falls on coordinative linguistic activity or, simply, *languaging* (see Cowley, 2019).The terminology stresses that language is activity with great attentional and actional power. In bringing this to the fore, one also looks beyond the discursive focus of classic ecolinguistics to stress how "language" shapes many domains of human life (including ones that draw on modes of silent thought).

Languaging uses an evolutionary history whereby human primates came to use social skills and resources as the basis for cultural and organizational life. When linguistic resources can become part of experience, coordinated activity can itself take on a historical dimension. In Maturana's (1970) terms, languaging enables people to become 'observers' or, in other terms, to act as persons who use the said (and the imagined) to channel what they perceive and to undertake actions. Languaging thus vastly extends human modes of acting, perceiving, attending, and solo 'thinking'. Given time and experience, persons develop socially based ways of performing. Not only do they use languaging to connect past and present but, remarkably, they find ways of using its potential in shaping future action.

As emphasized by 20th-century linguistics, the activity of languaging allows for linear description and analysis. In William James's metaphor, its flow can be experienced as like a stream. Yet, while working through individual bodies, languaging also draws on populations and ways in which their networks cooperate. Indeed, humans draw on its artificial or cultural aspect to gain powers that are strikingly analogous to that granted by the tape of Turing's universal machine (Wells 2006). Remarkably, the related point is prefigured by Charles Darwin:

> A great stride in the development of the intellect will have followed, as soon as, through a previous advance, the half-art, half-instinct of language came into use; for the continued use of language will have reacted on the brain, and produced an inherited effect; and this again will have had a reaction and an improvement on language.
>
> *Darwin 1981: 390–391*

While mistaken that brains inherit linguistic effects, Darwin is surely right that languaging alters cognition in many scales. It contributes to culture and co-evolution in ways that both affect activity in the here and now and have long-term influences on social life. Given inseparability from history,

languaging is both symbolic and actional. As people localize social practices (Pennycook 2010), they engage in coordinative activity or *symbiotic* modes of action (Cowley 2011). Languaging thus connects the historical with the bodily without having any need for metaphors of inner content and forms. What we call content arises from using familiar practices that, in a common world of things and persons, sustain unending reiterations of human ways of acting and perceiving. Languaging thus co-evolves with a socially distributed network that depends on, not brains that store linguistic facts, but rather coordinating, observing, and performing actions. As Kravchenko (2011) insists, this line of thinking challenges any kind of appeal to native speakers or speaker/hearers. Rather than reduce languaging to historical 'objects' with a locus in minds or brains, one turns to a history of perceiving, attending, and acting on the basis of what is observed. As a result of such activity, persons attune to social practices, modify their living bodies, draw on what is said, and, crucially, rework what is sayable.

Emphasizing the symbiotic nature of languaging links it to a long history of process views of language, at least going back to Humboldt's (1836) view on language as *energeia* (or activity). However, if languaging was *only* activity, it would not stand out from other human modes of action. Thus, languaging must connect its organic aspect with what Charles Morris (1938) calls its inorganic logic. In semiotic tradition, it is this inorganic or artificial element that allows language to be extended. In recent literature, the view has been reversed by tracing linguistic normativity to how communities use metalinguistic reflexivity (Taylor 2000). In linking this to a radical embodied view, van den Herik (2019) explicitly argues that what philosophers call *content* derives from, neither representation nor mind but, rather, learning from metalinguistic reflection.

Why view languaging as at once normative and actional? Above all, the view allows people to act in the here and now by gaining familiarity with practices: symbiotic activity arises as linguistic patterns are woven into whole body activity. Languaging is thus co-constituted (performed alone or together) as the results of activities are evaluated from a population-level perspective (Steffensen & Harvey 2018). In the case of face-to-face interaction, people vary ways of attending to vocal and other dynamics and, in so doing, attribute more or less importance to the articulatory gestures or repeatable patterns. In Love's (1990) terms, languaging consists in two orders, each of which is irreducible to the other. On the one hand, it is physical coordinative activity that enacts *first-order languaging*. On the other, physical events include repeatable patterns or *wordings* that, for members of a population, invite modes of analysis. They are the basis for the metalinguistic reflections that shape what, echoing Love (1990), can be called *second-order language* (Thibault 2011).

Given its symbiotic nature, languaging always has a particular sense. As people vary their attending, they alter how they perceive and engage. At times, repeatable verbal (and vocal) activity is heard in terms of patterns that shape expectations; at others, coordinating itself suffices to prompt the speaking, acting, and attending of parties. Given its two orders, languaging can be described as *activity that includes physical wordings*. The physical events of first-order activity always lend themselves to a partial description in terms of a second-order that is regularized, standardized, formalized, and, above all, conceptualized around words and rules with meaning potentials that have grounded many kinds of logic (and writing systems). As Thibault (2011) points out, what linguists normally regard as 'language' consists in such second-order patterns.

Languaging unites experienced bodily activity (organic *energeia*) with patterns that derive from history (inorganic or artificial *ergon*). Crucially, linguistic symbiosis enables humans to self-modify as they perform activities, orient to persons, assess attitudes, and engage with the said (e.g., both what might be meant, and the words actually spoken/written). Taking the symbiotic nature of languaging into its fullest account, the radical embodied view is able to develop the following tenets: (1) Languaging evolves as public activity, which, over time, enables persons to use their experience as observers; (2) such observers link embodiment with the said, and by so doing they impact on a wider whole; and (3) the many interlocking timescales of languaging bind perception, attention, action, and affect. Thus, languaging is activity during which physical wordings have a

major constitutive role in experience. Seen from the perspective of a population, languaging is *first order activity with a second order aspect*.

4. Current Contributions and Research

As outlined in the previous section, radical embodied ecolinguistics approaches language without appeal to representations, content, or linguistic form. Rather, it builds on how hominin skills co-evolved with communities, action, perception, and, in humans, languaging. On this view, the same contingency and decision-making powers are likely to shape attending, perceiving, acting, and linguistic skills. They demand a pluralistic view of evolutionary change, as described by figures like Darwin (1981) and William James (1890). By allowing languaging to be symbiotic and collective, there ceases to be any need to posit special evolved mechanisms (Kuhle 2018). As in cultural psychology, one accepts that "mind does not operate independently of what it is thinking about […] thinking is not the operation of a CPU" (Heine 2008: 25). Just as with silent thought, a talking person uses "the content one is thinking about" while "participating in the context in which one is doing the thinking" (Heine 2008: 25–26). In languaging, then, collective resources permeate human action, and history is thus central to how human beings self-modify within a changing environment.

So far, so good. But what of the bio-ecological concerns that are central to ecolinguistics (cf. section 2)? To answer this question, let us first specify what a "bio-ecology" is. The term was used by Clements and Shelford (1938) to describe changing "plant animal formations" in a given pond. It thus connects particular living organisms, temporalities, and the contingencies of place: a bio-ecology is an entanglement of co-existence and events. A bio-ecology thus draws on biophysical contingencies that can be experienced by an observer (who uses certain equipment, methods, etc.). Although Clements and Shelford did not include humans in their bio-ecologies, they indicate that, in the future, this can be done. Indeed, humans too depend on bio-ecologies that render possible encultured ways of life. Just as evidently, languaging allows us to willfully bring aspects of the past to the present in ways that influence—and transform—our bio-ecologies. To capture how second-order patterns transform human life, Steffensen (Steffensen 2011; Steffensen & Fill 2014) introduced the term *extended ecology*. Human activity unfolds as people coordinate their ways of languaging in various historical scales. Thus, in an extended ecology, second-order patterns influence what is done, said, or imagined in the here and now. Accordingly, human beings navigate in the extended ecology by drawing on "sense-saturated experience" (Harvey, Gahrn-Andersen, & Steffensen 2016; Steffensen 2013).

Human cognition is thus *ecological* and *collective*: skilled bodily activity is localized or actualized by sociocultural practices. For instance, prosody sets off interpersonal events (Cowley 1998), problem solving uses interactivity (Steffensen, Vallée-Tourangeau, & Vallée-Tourangeau 2016), disjunctions in talk set off displays of *selving* (Thibault 2019), and demonstrative movements shape medical decision making (Trasmundi & Steffensen 2016). Very generally, people use expertise to sustain favored ways of integrating events in the course of activities and projects. In this context, we highlight two interconnected implications. First, as Hood (2012) argues, subjectivity is collectively derived. One can only become a human being through the humanity of others or, as in isiZulu, human interconnectedness demands a concept of *ubuntu*. Second, in becoming human through others, human beings draw on a plurality of bio-ecologies. In parallel to *ubuntu*-based humanity, the human lineage is entirely dependent on those of other species.

In rejecting any 'linguistic' form of mental gymnastics, a radical embodied view turns to tools as diverse as ethnography, investigation of multimodality, agent-based modeling, and dynamic systems theory. The latter is especially important in cognitive science and, as applied to phonetics, it allows verbal patterns to be traced to articulatory acts that can be tracked in real time by means of close shadowing of what is heard (Fowler & Magnuson 2012). Further, since these acts are

coordinated with other aspects of vocalizations, gestures, shifts in posture and the like, together, bodies contribute to social praxis. Accordingly, any radical embodied approach to *human* cognition is bound to link the extended ecology with socially organized behavior that draws on conversation, talk-in-interaction, and multimodal activity.

Radical embodied ecolinguistics thus connects small-scale actions, the extended ecology, and bio-ecological transformations based on social activity. Instead of centering on individual persons, languaging is seen as sustaining human living. For ecolinguists, special weight falls on how its scientific extensions extend understanding beyond the human domain. Indeed, we now know quite a lot about bio-ecological change and, indeed, our role in shaping evolution. Roy Rappaport brings home the moral of this view: "If evolution, human and otherwise is to continue, humanity must think, not only about the world, but on behalf of the world of which it has become a special part and to which, therefore […] it has enormous responsibilities" (Rappaport 1999: 461). In order to face such responsibilities, individual experience must be placed in a larger picture. Attention also needs to fall on, in the first place, how collective and normative aspects of languaging transform bio-ecologies. Second, in Finke's terms, one can pursue how languaging changes praxis in order to seek the "rebirth of a culture of science that would be able to save our planet instead of furthering its problems" (Finke 2019: 23).

5. Future Directions

As argued by Steffensen and Fill (2014: 17), if one sees language as a formal system (*la langue*), or indeed as a Cartesian *res cogitans*, language can only be *about* nature, it will never be *of* nature. Linguistic theory is thus unable to seek validity in external criteria and, for this reason, Hjelmslev (1961) famously proposed an "empirical principle" whereby a "description shall be free of contradiction (self-consistent), exhaustive, and as simple as possible" (Hjelmslev 1961: 11). By contrast, radical embodied ecolinguistics treats language as a part *of* nature. Not only do we say things *about* nature but, in so doing, we coordinate by drawing on bio-ecological experience. For the same reason, description and evaluation of language fall under exactly the same criteria as for all ecological domains. In section 3, we therefore allowed radical embodied ecolinguistics to use the methodological tools of the life sciences. In so doing, we emphasized the importance of consilience; now, in turning to future directions, we consider moral and political implications.

Rejecting mentalism is to open up the question of *what language does to us*. This framing suggests a kind of paradox: while persons actively use normative aspects of languaging in collective domains, these same aspects exert many unrecognized effects. In turning from Merton's CUDOS values, therefore, radical embodied ecolinguistics adopts a *stance of interestedness*. In so doing, a core ecolinguistic concern is that of pursuing bio-ecological dynamics. In reaching beyond the epistemic, it highlights ways of coming to know things about what we know (see Potter 1988). In educational domains, Li (2017) asks how translanguaging can improve human living. From this it is a small step to pursuing how bio-ecologies draw on languaging. As Li (2017) argues, approaches of this kind need a practical theory to pursue how practice can transform our futures. Slightly tongue in cheek, he echoes a Chinese lineage from Confucius to Mao:

> Mao […] emphasized the dependence of theory on practice, that is, theory is based on practice and in turn serves practice. The process of theorization, or knowledge construction, involves a perpetual cycle of practice-theory-practice. The crucial first step in knowledge construction is descriptive adequacy.
>
> *Li 2017: 11*

Having traced languaging to living, a practical theory can begin by raising awareness of how social networks enable language to do things to us. This depends, above all, on how beliefs operate to

ensure that people's voices and wordings extend the sensorium, and given the interdependence of action and perception, such voices and wordings will impact on the extended ecology. Steffensen (2011) compares sensing and acting at a distance with how a web enables a spider to catch its prey while out of phenotypical reach. Likewise, the spider uses the web's vibrations to sense exactly where a fly is located. By the same token, wordings allow us to act through the agency of others ("can you pass me the salt?") and, of course, orient to their extended sensoria ("look at the rain" or "believe the science!"). From infancy, persons learn by acting on the basis of expectations and beliefs as extended sensoria contribute to, and even dominate, their sense of what they can achieve. Media and institutions are thus, at once, agential systems "out there" and able to set off extended action-perception cycles that co-constitute (and transform) the bio-ecologies on which living depends.

In the first place, radical embodied ecolinguistics can strive to raise bio-ecological awareness. Second, the dawning awareness can be used to change attitudes and, at times, develop positive linguistic action. Similar views appear in appeal to ecosophy, ideological commitments, and, importantly, in Stibbe's (2015) aspiration to construct new stories to live by. Far from being value free, ecolinguistics has the goal of transforming human ways of living. Given a basis in radical embodiment, it links with Peter Finke's (2014) aspiration to develop new transdisciplinary (and consilient) ways of working with the sciences. By stressing the collective nature of beliefs (and knowledge), it raises new questions about scientific reach and limits. For instance, while global issues demand socio-political ways of using what we know, civil society can often act in positive ways to mitigate local degradation. In developing new know-how, both media and scientific knowledge can promote awareness of the interdependence of the living. While activist aspirations are part and parcel of contemporary ecolinguistics, the radical embodied view opens up ways of languaging that influence local praxis. In other environments, it can also be used in revitalizing languages and, indeed, nurturing new approaches to learning a new tongue. This perspective meshes with how Li (2017) and others stress the power of translanguaging in shaping identity and raising self-esteem. Further, it offers insight into how local ways of speaking/living can promote thriving bio-ecologies. In contrast, where languaging is seen as abstract—for instance as driven by economic models of consumption and production, or by neoliberal models of education and management—the results often impact negatively on mental health. The reason is that, in part at least, human beings tend to adopt a self-perception that removes them from the meaningful social and natural contexts in which they live. We are prompted to understand ourselves as individuals, and not as part of *ubuntu*-based communities and bio-ecologies.

Given metalinguistic reflexivity, one can raise bio-ecological awareness by using functional and social semiotic models of language. Rather than approach discourse only in terms of "analyzing language" (which on a radical embodied ecolinguistic view is a blatant reification), one can use a wide range of textual resources to cultivate reflexivity and enhance bio-ecological awareness. Such approaches can thus be used to explore how extended ecologies draw on (second-order) patterns to mask beliefs (or 'content'). Such an interpretation of functional models links radical embodiment to how people speak *about* the world or, as Halliday (1992) argues, to critique of classism and growthism. Yet, in contrast to intellectualism, radical embodiment encourages actual people to use the critique in local bio-ecologies. It pursues how organizations can be used to promote positive action through languaging. This connects living persons with places as they use their extended sensoria to make judgments and decide on action. Ecolinguistics can thus pursue what we are as languagers and, by so doing, open up new ways of conceptualizing the role of humans as part of the living world.

Although Haugen intuited that languages interact with the environment, he had no concept of languaging. As a result, he relegated linguistic powers to the workings of mental gymnastics. Once a radical embodied view liberates language from the imaginary prison of 'mind', Haugen's intuition can be developed. Indeed, appeal to linguistic symbiosis is a step towards fostering observing and

making experience explicit. In raising bio-ecological awareness, normative features of language can be used like (or as) a lexicogrammar while also encouraging persons to actively use languaging to bring about bio-ecological effects. People gain a *raison d'être* from embedding bodily activity in social projects as they *language within an extended ecology*. If normative structures are to generate understanding, they must be linked to behavior: languaging must link up history, contingencies, bodies, and how living organisms self-modify, innovate, and change.

Our proposal, thus, is that ecolinguistics and cognitive linguistics together make a radical embodied turn. In so doing, they can build a moral and political agenda that arises from linking languaging to the life sciences: on this view, like medicine, ecolinguistics becomes "an axiological science with an explicit ethics" (Døør & Bang 2000: 54). Seen this way, it is surely possible to meet Rappaport's desideratum by bringing others to accept that "humanity must think, not only about the world, but on behalf of the world" (Rappaport 1999: 461). As we language within an extended ecology, we can use human powers in taking responsibility for the future of both human life and the wider living world.

Further Reading

Fill, A., & Penz, H. (2018). *The Routledge handbook of ecolinguistics*. New York: Routledge. (Fill and Penz's handbook is an authoritative overview of central positions and arguments in contemporary ecolinguistics.)

Mühlhäusler, P. (2003). *Language of environment, environment of language: A course in ecolinguistics*. London: Battlebridge. (Mühlhäusler's book integrates environmental issues ('Hallidayan' ecolinguistics) and a critical view on the linguistic tradition.)

Cowley, S. J. (Ed.). (2011). *Distributed language*. Amsterdam: John Benjamins. (Cowley's edited volume examines language from the distributed perspective that, coupled with radical embodiment, underpins the ecolinguistic view presented here.)

Steffensen, S. V., & Fill, A. (2014). *Ecolinguistics: The ecology of language and the ecology of science*. Special Issue of *Language Sciences*, *41*(A). (This special issue brings together key figures in ecolinguistics, including more radical takes on the field. It includes the editors' comprehensive state of the art of ecolinguistics.)

Related Topics

embodiment; cognitive pragmatics; cognitive poetics and the problem of metaphor; cognitive linguistics and discourse studies; culture in language and cognition

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43

COGNITIVE LINGUISTICS AND LINGUISTIC TYPOLOGY

Yuzhi Shi

1. Introduction

The primary goal of contemporary linguistics, no matter what framework is used, is to explore the common property of human language, but focusing on different perspectives or dimensions. For instance, generative linguists have long been interested in a set of rules or principles governing the abstract form system, producing well-formed instances and excluding ungrammatical ones (Chomsky 1957, 1981). By contrast, cognitive linguists try to identify the common property of universal syntactic categories such as nouns and verbs, where nouns are regarded as representing things and verbs representing processes (Langacker 2013: 103). Many researchers in typology have been discovering the implicational universal since the seminal work of Greenberg (1966). In this area, however, all so-called universals are actually kinds of tendencies or statistical regularities, and the universal correlation with the least exceptions (i.e., Chinese; for detail, see Dryer 1992) is the Universal 24 of Greenberg (1966):

> If the relative expression precedes the noun either as the only construction or as an alternate construction, either the language is postpositional, or the adjective precedes the noun or both.

The motivations behind these implicational universals are still not clear, although Greenberg postulates that "typological universals of language were valuable because they were a window onto the human mind" (Croft 2016). This chapter uses one of the most basic yet common cognitive abilities—CONSTRUAL—to explain why there are always cross-linguistic variations within any grammatical categories. On the other hand, each element in a given structure bears its own semantic value, which means that there is no form devoid of meaning. This finding in turn strengthens one of the tenets of cognitive linguistics which claims that grammar is by nature symbolic and all markers or structures consist of two poles—meaningful content and phonological form. As the following analysis shows, the combination of cognitive linguistics and linguistic typology provides a scientific methodology to discover and to explain language universals.

A vast amount of empirical evidence in linguistic typology, and grammaticalization in particular, reveals that there is always a limited domain for the possible variations of any grammatical categories. Typological diversity for any grammatical category originates from the diachronic

developments in different languages (Comrie 1981: 201). It is assumed that grammatical markers (i.e., functional words) evolve from normal lexical items, called content words. Heine and Kuteva (2002) is an excellent work reflecting the investigations of thousands of languages up to now and surveying the possibility of lexical sources for various grammatical categories. Among the total 154 distinct grammatical categories, the minimal lexical source for a given grammatical category is one, such as the "evidential" marker from the "say" verb only and the "indefinite" marker from the number "one" only. According to their statistical work, the number of possible lexical sources ranges from one to 14. As typological investigations become deeper and wider, these specific statistical numbers may need to be revised accordingly, but one thing will remain unchanged for certain: the possible variations for any grammatical domain must have a limit, for instance, the variations of passives cannot deviate from the number "14" too far. By contrast, the possible phonological representations for a given concept are in general unlimited, being purely arbitrary, for instance, the concept referring to "a written or printed work consisting of pages glued or sewn together along one side and bound in covers" is *book* in English, *shū* in Chinese, *reservar* in Spanish, *buchen* in German, *buku* in Japanese, and so forth.

As just mentioned, of the total 154 grammatical categories that Heine and Kuteva (2002) have investigated, passive markers have the most diverse lexical sources, being grammaticalized from 14 content words, as listed in Table 43.1. The list is not exhaustive, for instance, one major type missing is the passive morphemes from locative prepositions, exemplified by the English *by*, Japanese *ni*, and Old Chinese *yú*. The authors might have taken the viewpoint of Langacker (1991) that only the copular *be* and past participle constitute the essential components of the English passive but the preposition *by* does not, hence excluding this type of locative preposition from their book. But excluding locative prepositions might be reasonable in English but it is the only overt marking for most passive instances in Old Chinese. With approximately 3,300 years of well documented history and more than 1,000 dialects with remarkable grammatical differences, the Chinese languages not only possess most of the passive markers listed in the table but contribute some new types to the set of lexical sources for passive markers as well. For instance, the Chinese verbs *ràng* and *jiào*, both of which mean "allow" or "let-be", were grammaticalized into passive morphemes in late Modern Chinese (from the 17th century to the 19th century), still being the most frequent markers for passive structures in contemporary Chinese.

Table 43.1 The lexical sources for passive morphemes

Lexical sources	*Languages*
(1) *anticausative*	North!Xun; Early Romance
(2) *change of state*	Persian; Korean; Latin; German; Latvian
(3) *come*	Ladin (Rhaeto-Romance); Pomattertitsch (Walser German)
(4) *comitative*	Baka; Lamang
(5) *eat*	Early Modern Chinese; Korean; Juang
(6) *fall*	Korean; Tamil; Tonga
(7) *get*	English; German; Vietnamese
(8) *give*	Mandarin Chinese; Kedah Malay
(9) *go*	Italian; 12th-century Apabhramsa
(10) *nominalizer*	Abma; Bola
(11) *per-pro, third plural*	Kimbundu; Luba; Ewe; Nuer
(12) *reflexive*	North!Xun; Danish; Teso
(13) *see*	Old Chinese; Italian; French
(14) *suffer*	Chinese

2. Some Theoretical Preliminaries

No other structures have received more attention than passive structures in creating and developing linguistic theory in the past half-century. The theoretical importance of the passive is partially due to its structural property in contrast to the corresponding active counterparts, and partially due to its special treatment in the classical generativist theory of Chomsky (1957). Apart from the mainstream of linguistics, almost all linguists with different theoretical frameworks have made use of the morphosyntax of the passive to argue for their theory or against others, e.g., Langacker (1987, 1991, 2013) for cognitive linguistics, Lakoff (1971) and Bouton (1973) for formal semantics, Bresnan (1982) for lexical-functional linguistics, Pollard and Sag (1993) for HPSG, Weiner and Labov (1983) for sociolinguistics, Kroskripty (1985) for anthropological linguistics, Goldberg (1995) and Croft (2001) for construction grammar, Bennett (1980) for relational grammar, Comrie (1981) for linguistic typology, Hopper and Traugott (2003) for grammaticalization, and Kiparsky (2013) for a "null theory". A review of each theory is beyond the scope of this chapter, but an introduction to the standpoint of cognitive linguistics, in contrast to the stance of generative linguistics, is obviously relevant here.

The putative transformation between an active clause and its corresponding passive has been a pivotal issue in developing generative linguistics. In the classical analysis of Chomsky (1957) and subsequent works of his followers, the passive structure is formally derived from the corresponding active one through a series of phrasal rules. In this treatment, the elements in the passive, including the copula *be*, the past participle *-ed*, and the preposition *by*, are freely inserted without contributing any semantic value to the passive outcome. By contrast, Langacker (2013: 118) argues that each of these elements constituting passive bears its own semantic values, rather being arbitrary or a pure grammatical idiosyncrasy. Specifically speaking, the past-participle morpheme *-ed* indicates an atemporal and resultative state like an adjective, removing the transitivity of the verb in the passive, and the copular *be* imposes its processual profile on the composite expression. Here, the preposition *by* is optional, only used when the agent needs to be mentioned.

The passive pattern in English is language-particular, far from being universal, merely representing one type of the numerous variations for passive across languages. The central conception of "construal" is essential for explaining why these cross-linguistic variations could happen. The term "construal", which comes from cognitive psychology, refers to a daily cognitive ability of how individuals perceive, comprehend, and interpret the world around them (cf. Langacker 1987, 1991). The relevance of subjective construal has become common knowledge in every subdiscipline in psychology. And it is recognized that there is a difference between self-construal and construal in a social atmosphere (Ross 1987). As far as linguistic expressions are concerned, individual construal usually influences selecting concrete instances but social construal might determine the selecting of the lexical sources of grammatical markers. Within the framework of cognitive linguistics, under the concept of construal is a set of more concrete cognitive behaviors on which different scholars do not share exactly the same viewpoint (for a survey on this issue, see Verhagen 2006; for different views, see Langacker 1987; Talmy 2000; and Croft & Cruse 2004). (1) lists the lower-level concepts than construal that are most relevant to the present analysis.

(1) a. Perspective
    b. Prominence
    c. Abstraction
    d. Schematization

The above concepts are helpful in explaining cross-linguistic variations of passive structures, as we will see in the next section.

3. Passive Event and Its Construal

Typically, a passive event involves the following three elements:

(2) a. Agent
b. Action-Resultative
c. Patient

Most languages (if not all) provide an alternate between the active and passive structures to express the same event. From the pragmatic perspective, speakers can freely choose either an active structure or a passive one to portray the same event according to their personal construal. This pragmatic use is however not the concern of this chapter, and our primary aim now is to show how the social construal of a language community influences the selection of lexical sources for grammaticalizing into the passive morphemes, collectively resulting in the typological diversity in passive.

3.1 Construal from Locative Perspective

In a normal circumstance where a passive event happens, the agent and the patient must physically exist in the same location. This "same location" can be viewed from two slightly different perspectives: first, the agent and the patient occur in the same locative domain, as illustrated by the two Old Chinese examples in (3) and (4); second, the location of the agent is close to the patient, e.g., the preposition *by* introducing an agent for a passive instance means "close to" or "next to", as illustrated in *John sat by the window*. Although in English *by* is not an essential component for a passive expression as Langacker (2013) claims, the preposition *yú* in Old Chinese, being equivalent to *at*, *in*, or *on* in English, often was the only grammatical morpheme marking a passive instance. Then, the locative and passive instances shared exactly the same marker and syntactic schema in Old Chinese.

(3) *Qí Hóu méng zhūhóu* ***yú*** *Kuíqiū*.
Qi Marquis form-alliance dukes in Juiqiu
"Marquis Qi formed an alliance with dukes in Kuiqiu." (Zuo Zhuan, c. 500 BCE)
(4) *Wáng Yáo bì* ***yú*** *Zhuāng Wáng*.
Wang Yao love YU Zhuang Wang
"Wang Yao was loved by Zhuang Wang." (*Zuo Zhuan*, c. 500 BCE)

The semantic foundation for the "comitative" preposition to develop into a passive morpheme also results from a space perspective of construal. The agent, *together with* the patient, appears somewhere, creating the chance for something to happen between them. For instance, the Baka *tɛ*, which is a comitative preposition "with", has become a passive marker with impersonal agents (Kilian-Hatz 1992: 63). A similar development path has been identified in Wolff (1983: 171–172). The Chinese preposition *yǔ* "with" is also sporadically used as a passive marker in history, as illustrated in (5), though it never was specialized for the function to express passive.

(5) *Fū Chāi suì yǔ Gōu Jiàn qín*.
Fu Chai then YU Guo Jian capture
"Then Fu Chai was captured by Guo Jian." (*Zhan Guo Ce*, c. 200 BC)

Interestingly, the verb *āi* in Chinese, which literally means "stand next to (someone)" or "get close to (someone)", can function like a passive morpheme in some verb compounds, for instance, *āi* + *pī* "criticize" means *being criticized* and *āi* + *dǎ* "beat" means *being beaten*. In some dialects this verb

has been grammaticalized into a stable passive marker, such as in the Suqian dialect (belonging to the Wu family; Huang 1996: 666).

(6) *Fàn dōu āi tā chī-guāng le.*
food all AI he eat-finish PERF
"All the food was finished by him." (The Suqian dialect)

Note that there is an asymmetry in marking passive if the space construal is chosen. Logically speaking, if the patient is adjacent to the agent, it must be true that the agent is adjacent to the patient. When a passive expression is chosen, however, the patient is taken as the subject, called figure or trajector, and the agent is downgraded as an adjunct (i.e., the object of the preposition), termed as the background or landmark (Langacker 1987). In other words, the patient becomes syntactically more prominent than the agent in this situation. In this case, the "patient" subject tends to be unmarked and the "agent" adjunct is likely to be marked, for instance, it is natural to say *a picture on the wall* but *the wall behind the picture* sounds awkward because the picture is usually regarded as a figure. For this reason, a language universal with regard to marking passive structure is that the agent must be marked by the passive morpheme from a locative preposition if the language adopts the space construal for its passive expressions.

3.2 Construal from the Patient Perspective

In passive instances the patient becomes the focal point. Thus, there is a wide range of construal options from the patient perspective. First, the patient must visually witness what happens to them. If this perspective is taken by a language community, the verb "see" stands a good chance to be recruited for grammaticalizing into the passive marker, such as Old Chinese, Italian, and French (Lehmann et al 2010; Giacalone Ramat 2017; Heine & Kuteva 2002). Second, a passive event usually causes a negative effect on the patient, and if a language community construes the event from the perspective of negative effect on the patient, the "suffer" verb may be grammaticalized into a passive morpheme, e.g., languages of this type are Vietnamese (Haspelmath 1990), Korean (Rhee & Koo 2014), and Early Modern Chinese (Heine & Kuteva 2002). In addition, the semantic foundation for the "eat" verb to be grammaticalized into a passive morpheme is also triggered by the same construal as that of the "suffer" verb, and languages of this type include Early Modern Chinese (Jiang 1989), Korean (Haspelmath 1990: 41), Kharia (Haspelmath 1990: 41), and Juang (Coupe 2018: 221). Consider the case of Early Modern Chinese. Prior to developing into a passive marker, the verb *chī* "eat" can be extended to express suffering many unlucky things, for instance, *chī jiàn* "eat arrow" means *to be hit by an arrow* (see Jiang 1989 for a detailed description). During the period from the 11th century to the 16th century, the verb *chī* "eat" became one of the major passive morphemes, as illustrated in (7).[1]

(7) *Dàchóng yě chī tā dǎ-shā le.*
tiger also CHI he beat-kill PERF
"The tiger was also killed by him." (*Shui Hu Zhuang*, c. 1400 CE)

If the passive morpheme of a language originated from the "suffer" construal, its passive structure strongly tends to express adverse contents, such as the Chinese passive structure marked by *bèi*, a morpheme from the "suffer" verb (see Li & Thompson 1981: 492–502). According to our comprehensive investigation, all passive instances marked by *chī* contain an adverse connotation. In addition, the passive marker from the "fall" verb also originates from the construal of the patient's suffering. Languages taking this strategy to interpret a passive event include Korean (Rhee & Koo 2014), Tamil, and Tonga (Haspelmath 1990: 39).

Third, the patient can be viewed to metaphorically receive something since a passive event typically affects the patient through some kind of change, such as displacement, injury, acquirement or loss of objects, and so forth. If construed from this perspective, the "get" verb becomes the best candidate for grammaticalizing into the passive marker, e.g., Colloquial German (Lehmann 1991: 517), Welsh (Haspelmath 1990: 42), Creole (Corne 1977: 164–165). The verb *get* in English is often used to express passive instances, as illustrated in (8), which co-exists and competes with the canonic structure "*be* + V-*ed* + *by* NP".

(8) a. *I never get invited to parties*.[2]
b. *He got caught by the police driving at 120 mph*.
c. *My watch got broken while I was playing with the children*.

Fourth, the patient can be seen to be somehow responsible for the occurrence of a passive event. Imagine that the patient allows someone to do something to them, they may give someone a chance to do something to them, and they may create a condition for something to happen, either purposely or unconsciously. For instance, when one is walking in a park, he/she in fact creates a condition in which he/she might be seen by someone else or hit a bicycle. When a language community construes a passive event from the perspective of the responsibility of the patient, the verbs "give", "allow" or "let-be" may become the best candidates for grammaticalizing for the passive markers. According to the latest typological investigations, I have to admit that languages taking this construal strategy to recruit their passive markers are rare; according to Heine and Kuteva (2002), all the languages with the passive marker from "*gěi*" belong to the Chinese family or relate to the Chinese language, including standard Chinese, Chinese dialects, and Kedah Malay due to intensive language contact with Chinese (for details, see Peyraube 2015: 61; Chappell 2015: 29; Bao & Wee 1999). The major passive markers in present-day Chinese are grammaticalized from the verbs meaning "give", "allow", or "let-be". Cao (2008) has investigated 930 dialects of Chinese, revealing that there are about 60 different passive markers which might originate from different lexical sources. The first three most common lexical sources for passive markers are listed in Table 43.2.

A grammaticalization change must happen in certain suitable contexts (Hopper & Traugott 2003: 39–70). Construal from different perspectives influences the selection of lexical sources for a given grammatical marker, that is, these lexical items could not acquire the grammatical function unless they are frequently used in proper context over time. The passive markers from "give", "allow" and "let-be" were grammaticalized from a pivotal construction where the agent noun must appear to make it well-formed. Consequently, the passive structures from this type of lexical source require that the agent noun be present to be well-formed (for details, see Zhu 1982; Lü 1996, among others), as exemplified in (9), a typologically unique feature that has not been attested in any other languages.

(9) a. *Yān hé jiào wǒ gěi rēng le*.
cigarette case JIAO I give throw PERF
"The cigarette case was thrown away by me." (Contemporary Chinese)
b. **Yān hé jiào ___ gěi rēng le*.
cigarette case JIAO give throw PERF

Table 43.2 The lexical sources for passive markers in Chinese dialects

Passives from "give"	Passives from "allow"	Passives from "let-be"
gěi	*jiào*	*ràng*
250 dialects	214 dialects	40 dialects

This unique feature that the agent is obligatory to appear is shared by hundreds of Chinese dialects whose passive markers are grammaticalized from the same type of verbs (i.e., "allow" or "let-be"). With regard to the distribution of the agent noun, the passive structures of Chinese have gone through a change from one extreme to another extreme. That is, in Old Chinese the passive auxiliary such as *jiàn* never introduced an agent noun in the preverbal position, and if an agent must be indicated, it could be introduced by the preposition *yú* in the postverbal position. Until Middle Chinese, however, the passive morphemes such as *bèi* developed a new function that could optionally introduce an agent in the preverbal position. From the 17th century to now, the Chinese passive has reached another extreme that requires the appearance of the agent noun to be well-formed.

3.3 Construal from Change of State

A passive event typically consists of an action and a change of state that is caused by the action. Although Chinese has no inflection for passive verbs, the predicates of passive instances cannot be a simple verb, that is, the verb must be followed by aspect markers, resultatives, reduplication, and the like, which serve to express some kind of change of state. In Table 43.1 there are four types of passive markers that come from this perspective of change of state in construing a passive event: the "change of state" type itself, the "come" type, the "go" type, and the "fall" type. These verbs can express some kind of change of state, as illustrated in the following English examples,[3] which affords them semantic suitability for evolving into passive markers.

(10) a. *It was becoming very dark*.
b. *What do you have to do to become a pilot*?
(11) a. *Leaves go brown in autumn*.
b. *She went white with anger*.
(12) a. *I'll make all your dreams come true*.
b. *You'll come to regret your decision*.
(13) a. *Tom fell ill last week*.
b. *James fell asleep suddenly*.

Quite straightforwardly, the verb "become" develops into a passive morpheme or can function to express a passive meaning, such as in Late Latin (Cennamo 2015), German (Heine & Kuteva 2002: 10), and Latvian (Vykypěl 2010: 137). What I try to demonstrate here is that all these four verbs have semantic feature in common, enabling them to develop into passive markers in different languages, but it does not mean that they have to be realized in exactly the same way across languages. This can explain why a limited number of languages recruit one of them for their passive structures, but not all languages do so.

The passive structure in English *be V-ed* also reflects the construal from the perspective of change of state. The copular verb *be* is often used to refer to a change of state, which is evident in imperative instances, e.g., *be quiet* or *be nice*. The past participle form of verbs in English passive is adjective-like referring to a resultative state after the action, as exemplified in *He is confused* and *The car is broken* (for this argumentation, see Langacker 2013: 118).

3.4 Construal from the Perspective of the Valence Loss of the Verb

All the three types of construal that we have seen above focus on a visible facet of the passive event in reality, whose degrees of specificity can be viewed basically as the same. At a lower level of specificity (i.e., more abstraction), the passive can be construed in this way: the loss of an object argument of the transitive verb, a characteristic pertaining to quite abstract grammatical property. It is cross-linguistically true that only transitive verbs, which assign an object argument in active

sentences, can be used in passive structures. Since the patient noun is promoted to be the subject of passive instances, they can no longer assign an object argument, signaling a loss of valence of the transitive verb. If a language community focuses on this change of the grammatical property of the verb, they would innovate certain grammatical forms to signal it. There are four types of passive markers in Table 43.1 that evolve from this perspective of construal: the "anticausative" type, the "nominalizer" type, the "third plural" type, and the "reflexive" type. All of these four types involve a pronominal element attached to the verb stem, where this pronominal element behaves like a clitic (i.e., prefix, infix, or suffix) in order to cancel the assigning of the object argument of the verb. The four grammatical categories themselves are formally related to each other, revealing that they have something in common. For instance, reflexive marker develops into intransitives in Aranda (Wilkins 1989: 256), into an anticausative marker in French (Heine & Kuteva 2002: 252), and directly into a passive marker in Danish (Haspelmath 1990: 43). Moreover, the nominalizer in Old Chinese is *zhī* and in Modern Chinese is *de*, both of which were grammaticalized from a demonstrative pronoun, either "that" or "this". By adding a nominalizer to a verb stem, the verb becomes a nominal item and hence can no longer be followed by an object. According to Langacker (1991), the past participle in English also functions to make a transitive verb intransitive, like an adjective to express a stative property. That is, English also takes this strategy of the valence loss of the verb to construe a passive event.

Interestingly enough, in early Middle Chinese (from the 1st century BCE to the 4th century CE), the prevalent passive pattern is "*wèi ... suǒ*", where the first morpheme *wèi* is a copula and the second *suǒ* is a pronominal element to nominalize a VP. At that time, the phrase "*suǒ* … VP" refers to the thing involved, e.g., *suǒ shí* "*suǒ* + eat" literally means "eating thing (food)". The nominalizer *suǒ* here actually functions to cancel the assignment of the object argument. Let us see one example of this passive pattern at that time.

(14) *Wèi Tàizǐ wèi Jiāng Yǔn suǒ bài*.
Wei Prince WEI Jiang Yun SUO defeat
"Prince Wei was defeated by Jiang Yun." (*Hanshu*, c. 100 CE)

3.5 The Constraints of Typological Variations in Passive and the Semantic Values of Passive Morphemes

As mentioned in the beginning, among all grammatical categories, the passive has the greatest degree of diversity or most variations across languages, having a total of 14 types that are grammaticalized from different lexical sources. Chinese adds at least one more type to this list, that is, the passive markers in Mandarin Chinese and hundreds of dialects that evolve from the verbs meaning "allow" and "let-be" (i.e., *jiào* and *ràng*), which are not listed in Heine and Kuteva (2002). Also, they miss a major type of passive marker that is grammaticalized from locative prepositions, a widely attested phenomenon across languages. As far as I know, there are at least 16 types of passive markers, cross-linguistically, and this number is most likely to increase as the typological investigation continues. The reason why passive markers are so diverse is that different language communities construe the passive event from different perspectives, which can be summarized as in Table 43.3.

The table reveals some important properties of passive. One of them is that the number of possibilities of construal varies from one perspective to another. With regard to passive expressions, the patient is the focal prominence and thus receives the most possible perspectives of construal, a total of six in the table. At the same time, the agent is defocused in passive expressions and downgraded as an adjunct, thus receiving the least possible perspectives of construal (i.e., zero). Once the agent is viewed as the focal prominence, the expression should be an active sentence,

Table 43.3 The different perspectives of construal and diverse passive markers across languages

Perspectives of construal	*Lexical sources*
I. The location	(a) The "in" preposition
	(b) The "by" preposition
	(c) The "get close to" verb
II. The patient	(a) The "suffer" verb
	(b) The "eat" verb
	(c) The "see" verb
	(d) The "get" verb
	(e) The "allow" verb
	(f) The "let-be" verb
	(g) The "give" verb
III. The change of state	(a) The "become" verb
	(b) The "come" verb
	(c) The "go" verb
	(d) The "be" verb
	(e) The "fall" verb
IV. The valence loss of the verb	(a) Anticausative
	(b) Nominalizer
	(c) Person pronoun
	(d) Past participle

hence employing grammatical devices related to active instances. Therefore, we have the following unequal formula:

(15) The number of perspectives of construal for passive markers
Patient (7) > Change of State (5) > Change of Valence (4) > Location (3) > Agent (0)

The above formula is by no means an accident but reflects the common cognition of human beings on a passive event. The theoretical implications contained in this unequal formula are definitely worth exploring further. Notice that a language might take more than one perspective of construal in forming its passive structure, resulting in complex passive expressions in that language. Considering the English passive pattern, the phrase *be + V-ed* denotes a change of state, where the past participle functions to make the verb intransitive (Langacker 2013: 121). In addition, the locative preposition *by* is used when introducing an agent. That is, the English passive is an outcome of the combination of multiple perspectives of construal, that is, change of state and valence loss.

Given that in passive instances the patient is the focal prominence, it is used as the subject and remains unmarked. The patient serves as a vantage point to look around a passive event, which is reflected in two aspects: First, it is diachronically the agent of the group of verbs, i.e., "suffer", "eat", "see", "get", "give", "allow", and "let be", which are chosen as the lexical sources for grammaticalizing into passive markers. Second, when construed from a locative perspective, the patient is treated as the figure and the agent as the background, and hence the former is always unmarked but the latter usually marked by the passive form from a locative preposition. Furthermore, the syntactic schemas of passive are largely determined by the overall property of the grammar, for instance, each of the English and Chinese passives is formally in accordance with its own grammar.

As far as the degree of abstraction is concerned, the rankings of the four perspectives discussed above are as follows:

(16) The degrees of abstraction of different perspectives of construal
The loss of valence > the same location > the change of state > the effect on patient

The loss of the valence of the verb is regarded as having the highest degree of abstraction because this construal involves a grammatical analysis of the verb, a kind of quite abstract thinking. The shared location between the agent and the patient is related to a reasoning why the passive event could happen in a particular place. Though it is visible, the change of state is related to a comparison of two states before and after the passive event. Since the effect on patient is only connected with a current situation as well as being visible, it is considered to have the lowest degree of abstraction.

From the perspectives of construal in recruiting lexical sources for passive markers, it is evident that every element constituting the passive structure is meaningful. As pointed out previously, one of the major tenets of cognitive linguistics is that grammatical forms are always full of content, that is, no forms are devoid of meaning. Langacker (1987, 1991, 2013, etc.) makes this statement valid by analyzing the two essential elements of the English passive, that is, the copula *be* and the past participle. Within any individual language, the elements constituting its passive are also meaningful, which is evident from the original meanings of their lexical sources, in spite of semantic bleaching through the grammaticalization process. In other words, no elements comprising a passive structure are purely formal without semantic content, and the innovation of passive in any language is based on two essential factors: construal and semantic suitability of lexical source for the markers.

4. Social Construal and Passive Schema

When facing a passive event, theoretically, speakers have the freedom to construe it from all the perspectives discussed above. Since passive markers and structures are the outcomes of conventionalization over a long period of time, however, in a particular language individual speakers are deprived of the freedom and must obey the grammatical conventions. Which construal perspective eventually affects the lexical sources for passive markers is determined by a social construal rather than an individual one. Social construal is highly regular and thus predictable in two senses: first, the social construal is consistent in a language community in a given geographic area and in a particular time; second, it is subject to the influence of the overall property of a grammar at a particular time. In particular, the overt structure of passive in a language must not be in conflict with its grammar system. Specifically, the English passive structure *be + V-ed + by* is determined by the syntactic behavior of auxiliary verbs, the grammatical property of the past participle, and the distribution of preposition phrases. The specific structure of English passive, more crucially, is made legitimate by the rather abstract schema: "Aux + V-ed + PP", which is shared by many other syntactic structures, even including patterns of active sentences, as illustrated in the following examples.

(17) a. *The window was broken by Tom*.
b. *Bill was sleeping by the table*.
c. *They had finished their homework in school*.
d. *John is reading newspapers in the dining room*.
e. *Tom is good at playing basketball*.

In (17), only the first sentence is passive, and the rest of them are labeled differently in traditional grammar. However, all of them share the same syntactic schema as indicated above. From this

Table 43.4 The major types of passives in the history of Chinese

Periods	*Perspectives of construal*	*Examples*
Old Chinese	(a) Locative	*yú*
(1300 BCE–100 BCE)	(b) The "see" verb	*jiàn*
Middle Chinese	(a) Change of state	*wèi … suǒ*
(100 BCE–1000 CE)	(b) The "suffer" verb	*bèi*
Modern Chinese–Present	(a) The "allow" verb	*jiào and ràng*
(1000 CE–2000 CE)	(b) The "give" verb	*gěi*

angle, there is nothing special about the passive structure (Kiparsky 2013). In fact, the concrete structure of the English passive is to a great extent determined by the grammar of English as a whole. This is to say that the perspective of construal responsible for the grammaticalization of the English passive, rather than a purely free choice of a language community, is guided by its grammar as a whole. Every native speaker lives in an already existent language system that may have developed over thousands of years or longer, which to a great extent determines the social construal on selecting lexical candidates for grammatical markers.

In the 3,300-year richly documented history of the Chinese language, there have been more than ten passive markers and various passive structures. For the sake of simplicity, just consider the dominant passive structures in each major period, which are summarized in Table 43.4.

Every time that the language community takes different perspectives to construe the passive event, namely selecting different lexical sources for passive markers, it must involve a change in syntactic configuration of the passive. The motivations for shifting perspectives of construal come exclusively from the overall change of the grammar system, that is, the construal perspective of a language community would not change for no reason.

Exactly like the sentential structures of English, Old Chinese as an SVO language allowed various types of preposition phrases to occur in the sentence-final position (i.e., after VO) to introduce locatives, comparatives, instrumentals, and others. As for passive instances, the locative preposition *yú* was extended to introduce an agent noun in the sentence-final position if the agent needed to be indicated in certain contexts. There was also a passive auxiliary at that time, which was grammaticalized from the "see" verb, preceding the main verb but unable to introduce an agent noun in any situation. Both the preposition *yú* and the auxiliary *jiàn* can be used independently to mark a passive clause, and they both can also be combined to make a passive instance, for example:

(18) *Wú cháng* ***jiàn*** *xiào* ***yú*** *dàfāng* *zhī* *jiā*.
I often JIAN laugh-at YU knowledgeable NOML expert
"I was often laughed at by those knowledgeable people." (*Zhuang zi*, c. 300 BCE)

During the transition period from Old to Middle Chinese, the language underwent a systematic change with regard to sentential structures. As a result, all the preposition phrases in passives as well as in locatives, comparatives, and instrumentals, could no longer appear in the sentence-final position and they gradually disappeared from there. In response to this global change, the passive pattern marked by *yú* collapsed, and since expressing an agent was sometimes necessary, the language community started to recruit a new lexical candidate to take on the task of introducing an agent in the preverbal position instead. At this time, the passive auxiliary *bèi*, which was grammaticalized as early as the first century BCE but could never introduce an agent until then (like the passive auxiliary *jiàn*), became the best candidate to fill this gap. As a result, *bèi* developed a new function to introduce an agent noun like a preposition, as illustrated in (19). By contrast, the

passive auxiliary *jiàn* that had been widely used in Old Chinese did not acquire the function and thus was abandoned.

(19) *Liàng Zǐ bèi Sū Jùn hài*.
Liang Zi BEI Su Jun kill
"Liang Zi was killed by Su Jun." (*Shishuo Xinyu*, c. 450 CE)

During the period from late Middle Chinese to Modern Chinese, one of the significant changes in Chinese grammar is the emergence and development of the disposal construction. This construction not only shares the passive with the same schema 'PP + VP" but, more importantly, is functionally complementary with the passive pattern. Specifically, the disposal markers serve to introduce a patient noun in the preverbal position, and the passive markers function to indicate an agent noun in the same position; the patient and agent are functionally related to each other. From the beginning of the emergence of the disposal construction, the appearance of a patient noun has been obligatory to make a disposal instance well-formed, as illustrated in (20). Most probably because of the analogy of the property of the disposal construction, an agent noun becomes gradually obligatory for the well-formedness of passive instances. The passive *bèi* never reached to this extreme where it necessarily introduces an agent noun, and its usage has greatly shrunken since the 16th century. Among the 930 dialects of Cao (2008), only 71 of them still use the passive *bèi*, and in the vast majority of dialects the passive markers are grammaticalized from other lexical sources, mainly the verbs meaning "give", "allow", or "let-be". More importantly, all these new passive structures require an agent noun to be grammatical, as illustrated in (21), similar to the fact that every English sentence with a finite verb needs a subject to be well-formed.

(20) a. *Tā bǎ fángjiān shōushí le yīxià*.
he DISP room clean PERF one-time
"He cleaned the room for a while." (Contemporary Chinese)
b. **Tā bǎ* __ *shōushí le yīxià*.
he DISP clean PERF one-time

(21) a. *Xiǎotōu ràng rén bǎng shù shàng le*.
theft PASS people truss tree at PERF
"The thief was trussed to a tree." (The crosstalk of present-day Pekingese)
b. **Xiǎotōu ràng* __ *bǎng shù shàng le*
theft PASS truss tree at PERF

Once again, the grammar system as a whole plays a key role in recruiting the appropriate lexical candidates for passive markers. The verbs *jiào* "allow" and *ràng* "let-be" are often used in a pivotal construction, where the following object is also necessary to appear; otherwise, the pivotal instances will be ill-formed, as illustrated in (22).

(22) a. *Wǒ ràng tā zǒu* le.
I let he go-away PERF
"I let him go away." (Contemporary Chinese)
b. **Wǒ ràng* ___ *zǒu le.*
I let go-away PERF

I want to highlight that the function of a grammatical marker is in general influenced by its lexical source, semantically and syntactically (Hopper & Traugott 2003). When the language requires the agent noun to appear in passive, the language community would favor a lexical item whose context for the grammaticalization path must contain a nominal object. In other words, both the "allow"

and "let-be" verbs satisfied this condition and thus underwent the change to be passive markers. One might wonder why the already existent passive marker *bèi* did not undergo further development to acquire the function that the agent noun be obligatorily present. It is cross-linguistically true that the old features of a grammatical form with high frequency are typically resistant to any analogical change (Bybee & Beckner 2010). In late Modern Chinese, *bèi* had been used as a passive marker for more than 1,800 years, and, especially, it could never introduce an agent noun in the first six centuries or so after it was grammaticalized from a "suffer" verb. The long and highly conventionalized usage of the passive *bèi* was hard to entirely eliminate due to its high frequency. So the language community turned to seek new passive markers to satisfy the requirement that the agent must appear in passive instances.

Through the above analysis we can see that selecting a lexical source for a grammatical marker is largely determined by the social construal of a language community, and what perspective is taken is in principle guided by the overall property of a grammar system at the particular time. Selecting a lexical source is not simply a semantic matter but involves the syntax of the lexical item. The language community tends to recruit a lexical item whose syntactic configuration resembles the structure of the grammatical marker.

5. Conclusion

The above discussion demonstrates that cognitive linguistics and linguistic typology can and should benefit each other, an extremely fruitful direction of language research. Two of the central concepts—construal and perspectivization—are critical for explaining the typological variations with special reference to passive markers. On the other hand, we see that every element of passive in any language is meaningful, strengthening the tenet of cognitive linguistics that claims that grammar is by nature symbolic and every grammatical element bears its own semantic value, no matter whether it is concrete or abstract. Without doubt, typological linguists cannot ignore cognitive linguistics if they want to produce a plausible explanation of cross-linguistic phenomena. Meanwhile, cognitive linguists will find more and more empirical evidence from typological investigation and such investigations will become more widely accepted.

Among all grammatical categories, the passive has the greatest degree of typological diversity in terms of the variations of the markers and structures. Also, a language may undergo a series of dramatic typological changes over time. These typological features result from a domain-general cognition—CONSTRUAL, which works not only at all linguistic levels, including lexicon and grammar, but in all knowledge areas of human beings, from sciences to daily activities. As far as grammatical categories are concerned, there is always an upper-limit for the possible typological variations. The present analysis shows that passive has a total of 16 variations across languages; new variations might be discovered in the future but the total cannot be much beyond this limit. And other grammatical categories have less variation than passive. The limitation of typological variation reflects an exception-free language universality, constrained by the related perspectives of construal. Individual construal determines which linguistic form is chosen to express their thoughts; social construal what grammar system the language community innovates. This social construal is to a great extent subject to the influence of the overall property of the grammar system at a particular time. This hypothesis is empirically plausible in explaining typological diversity.

The present analysis calls into question the model of generative linguistics about cross-linguistic variations and language changes (e.g., Chomsky 1981; Lightfoot 1991). This model proposes that all human beings are genetically endowed with so-called Universal Grammar, consisting of two components: (a) unchangeable principles that characterize the fundamental structure of language and restrict the level of attainable grammar, and (b) variable parameters that define the space of possible variation and are fixed by experience. That different language communities select different sets of parameters is responsible for structural variations across languages, and that different

generations (mainly due to child language acquisition) set different parameters causes language changes over time. This speculation can find no evidence, either typological or historical or psychological. As researchers in the camp of functional-cognitive linguistics put it, language is not created by an isolated and specific neural organ in the human brain but is a combinational product of more general cognitive endowments of human beings (for details, see Langacker 1987, 1991; Greenberg 1990). Language is shaped by human cognition and the communicative function of language (Givón 1989). These viewpoints are fully in accordance with my analysis of the typological variations, which are caused by human construal and expressions on passive events.

Notes

1 Wang and Shi (2019) discuss the motivation of the rise and decline of the *chī* passive in Modern Chinese.
2 This group of examples are cited from Swan (2000: 228).
3 The following three groups of examples are cited from Swan (2000: 111–112).

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Related Topics

cognitive semantics; word grammar; embodiment; construal; culture in language and cognition

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