New Challenges in Typology

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New Challenges in Typology

Broadening the Horizons and Redefining the Foundations

edited by

Matti Miestamo
Bernhard Wälchli

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Preface

William B. McGregor

In 2002 I was invited to chair the Association for Linguistic Typology Junior Prize (now called the Greenberg Competition) committee. Unfortunately, too few entries were received by the closing date for the 2003 competition to run it, and it was held over until the next biennial. On that occasion a baker's dozen Ph.D. theses were entered, including the three from the previous occasion; thus the competition went ahead. These covered theses submitted within the four-year period 2001–2004.

The thirteen theses covered a diverse range of typologically relevant topics, including both typology in the traditional sense of cross-linguistic investigations and language description, the foundations of any adequately informed typology. It was a great pleasure to read and evaluate these excellent investigations (I read all but one, which was written in Russian). Despite the hiccup in the 2003 competition – and that is what it seems to have been: there are ten entries in the current 2007 competition – it was clear that even if they represent relatively small domains within the wide field of linguistics, typology and description are alive and well, and are being passed on to a new generation of scholars.

It is no easy task to read and evaluate so many theses, especially given the variety of themes and approaches – how can one reasonably compare a thesis on a specific lexical or grammatical phenomenon in a representative sample of languages with a thesis describing the grammar of a particular language? In any event, after much reading and deliberation the committee unanimously recommended the editors of this volume as the joint prize-winners.

The present volume arises directly from the 2005 competition. One of the editors, Bernhard Wälchli, felt that the competition overemphasized the competitive side of academic research. He suggested that its cooperative aspect also deserved recognition, and should be fostered. This led him to make the very welcome proposal that there should be an edited book made up of contributions from the new generation of typologists, those who had completed Ph.D. theses in the first four years of the new millennium.

Following on this suggestion, Bernhard Wälchli and Matti Miestamo invited the entrants to the ALT Junior Competition, along with other young

scholars who had completed typologically relevant Ph.D. theses in the 2000–2004 period, to contribute to the proposed volume. The book you have in front of you is the result. It consists of sixteen papers, eight of which are written by entrants in the 2005 Junior Competition, plus eight by other young scholars, including a prize-winner of the 2001 Junior Competition, Michael Cysouw. It may thus be considered to present a representative, though incomplete (among the unfortunate absences are papers by some of the entrants to the 2005 ALT Junior Competition), picture of the current state of play in linguistic typology as practised by the emergent generation of researchers.

The papers are not, it should be noted, mere summaries of the authors' Ph.D. theses. Rather, the editors took the eminently sensible step of soliciting papers based on the contributors' theses, but that extend on that work by placing it in a wider context, exploring among other things the theoretical relevance and consequences of their researches: what their work means.

The main theme running through this volume is diversity, the essence of typology. There is diversity in the topics covered, which range across the main traditional divisions of phonology, morphology and syntax, also sociolinguistics and historical-comparative linguistics. Inclusion of contributions on phonology (González, Good, Hildebrandt, and Yu) is particularly welcome given that it has played a quite minor role in recent typological work. Interestingly, it is prosodic phonology that is principally represented. Morphology and syntax figure as most prominent in modern typology, and this is also reflected in the contents of the present book. Among the grammatical topics dealt with are a number of popular ones, including word formation (Wälchli); transitivity and case-marking (Næss and Zúñiga); pronominals (Cysouw and Puddu); negation (Miestamo); polysynthesis (Saulwick); tense, mood and aspect (Aldai, Sakel); and clause combination or complex sentences (Coupe and Verstraete). It is notable that new insights, approaches, and/or data are provided on each of these themes: the popular topics can still be profitably mined. Also addressed are less well trodden domains, including suppletion (Veselinova), mood (Verstraete), and complex predicates (to use the common though in my opinion not very appropriate label) (Sakel).

A number of papers address interface issues that challenge the viability of rigid boundaries between the three-way division phonology, morphology and syntax. Also challenged are the traditional distinctions between descriptive linguistics, theoretical linguistics, and typological linguistics, and the diachronic-synchronic division. Taken together the papers reveal the bidirectional interaction between these traditional divisions.

There is considerable diversity in the range of languages informing the investigations, as one naturally expects of a volume on typology. Perhaps more interesting than this, the contributions themselves show substantial differences in the number and extent of languages they treat. At one extreme we find the expected broad-ranging investigations based on representative samples of about a hundred to a couple of hundred languages (e.g., Cysouw, González, Miestamo, Veselinova, Wälchli); at the other extreme are contributions focusing on a single language (e.g., Aldai, Saulwick, Sakel); in between are papers dealing with genetically or areally delineated groups of languages (e.g., Coupe, Hildebrandt, Puddu, Verstraete). Thus we also find diversity in methodologies, reflecting the fact that there is no single right way of doing typology. The papers focusing on single languages nicely reveal the possible contribution of comprehensive in-depth studies of particular languages to typology. In the past, it has been largely Indo-European languages, particularly English and the classical languages, that have formed the basis of single-language informed typology. Contributions to this volume show some of the benefits that can be derived from selecting non-Indo-European languages, for instance, Australian languages (Saulwick), Panoan languages (South America) (González), Tibeto-Burman languages (Coupe), and Basque (Aldai). Most obviously, such in-depth investigations can challenge accepted typologies (as in the case of several in the book). But the relevance goes further: they can reveal directions for improved and less superficial typologies on the one hand, and on the other, may inform descriptive linguistics. In this context, it is especially interesting that one contribution (Verstraete) shows that there is more to extract from Indo-European languages, that Germanic languages can provide new insights that may be helpful in improving our typologies of certain grammatical phenomena.

Another significant methodological point that emerges from the contributions to this book is the important place of exceptions in linguistic practice. As already mentioned, some papers in the present volume reveal exceptions that challenge existing typological and theoretical paradigms. At least one paper (Veselinova) shows how a highly exceptional phenomenon in grammar, suppletion, may be patterned.

The contributions also show theoretical diversity, with both formal and functional approaches represented and/or tested. At another level, papers in this volume discuss the usefulness of, and problems with, theoretical devices or notions that have been employed in linguistic typology and language description, including templates (Good), semantic maps (Cysouw), prototypes (Næss), and markedness (especially Miestamo, Næss).

I highly recommend this volume to typologists, and indeed to linguists generally. The contributions are encouraging: one can expect a rosy future for both linguistic typology and language description. Both emerge in these papers as viable domains of linguistic research. The volume should also serve to demonstrate to advanced undergraduate and early graduate students of linguistics that these are indeed significant and exciting fields, with numerous open questions, with many questions yet to be asked, with a tremendous scope for development in all sorts of ways, and worthy of devoting one's energies to. The themes and approaches covered point out a number of promising directions for future research by young and old typologists. If I may add a personal note to this, my opinion is that the most important directions, the majority of which are covered in more or less depth in this book, are: markedness, the form-function relation, the interface of pragmatics and semantics, the impact of usage on grammar and typology, and relations between typology and cognition.

Hopefully the future will see a continuation of the innovation of the editors that will go hand-in-hand with the Greenberg Competition, and that future entrants to the competition will follow through with Bernhard and Matti's brilliant initiative and edit volumes representing the work of the latest crop of Ph.D.'s.

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Introduction

Matti Miestamo and Bernhard Wälchli

1. Aims of this volume

All linguists' views on the nature of language are biased by the selection of languages they happen to be familiar with and by the theoretical frameworks they have been trained in. One major function of typology is to reduce this bias by constantly broadening the horizons and by constantly redefining the foundations, not only for typology itself but also for linguistic theory in general. These are permanent challenges, but they are also new challenges for every new generation of linguists who have to address them in their own way; every new generation has the advantage of being in possession of a more advanced methodological toolbox and having access to broader cross-linguistic data.

This volume unites sixteen chapters written by typologists and typologically oriented field linguists who have completed their Ph.D. theses in the first four years of this millennium. The authors were asked to address selected theoretical questions of general linguistic relevance grounding the discussion in the wealth of empirical data collected in their individual research projects.

There are many ways in which the horizons of typology may become broader. The title of the book refers, particularly, to revisiting existing typologies with larger language samples, exploring domains not considered in typology before, taking linguistic diversity more seriously, strengthening the connection between typology and areal linguistics, and bridging the gap to other subfields of our discipline, such as historical linguistics and sociolinguistics.

Typology is not only assembling and comparing more and more data from more and more languages; it also means redefining the foundations of linguistic theory from the bottom up. Most concepts in linguistic theories have been coined on the basis of evidence from very few languages, mostly Indo-European. After having investigated particular phenomena in large-scale cross-linguistic studies, one always has to consider whether traditional concepts are in need of modification. In this volume, this is done by typologists who apply a variety of up-to-date methodological tools and who

can now take into account more languages than was possible only ten or twenty years ago. The linguistic phenomena scrutinized in this volume include the following: foot and stress, tone, infixation, inflection vs. derivation, word formation, polysynthesis, suppletion, person marking, reflexives, alignment, transitivity, tense-aspect-mood systems, negation, interrogation, converb systems, and complex sentences. More general methodological and theoretical issues, such as reconstruction, markedness, semantic maps, areality, templates, and use of parallel corpora, are also addressed. Most chapters in this volume deal with the inappropriateness of received theoretical notions when confronted with data from languages from all over the world.

Finally, redefining the foundations also involves reconsidering the interplay and overlap between various phenomena traditionally ascribed to different fields such as phonology, morphology, and syntax. The contributions in this volume draw from many of these traditional fields simultaneously, and show that it is becoming harder and maybe also less desirable to keep them separate, especially when taking a broadly cross-linguistic approach to language.

2. The chapters of this volume

The chapters are grouped into six thematic sections. In the section "Phonology and the interface between phonology, morphology, and syntax", the authors take a typological perspective on issues vividly discussed in phonogical theory. Synchronic phonology is not considered in isolation but in the context of its wider implications such as linear structure, diachronic evolution, and sociolinguistics. The reason why we start our volume with a section on phonology is to emphasize that phonological typology is an integral part of typology, and a source of innovative approaches for both typology and phonological theory.

Jeff Good's contribution systematizes the notion of template, which has been applied to a wide range of phonological, morphological, and syntactic phenomena. It provides a framework for classifying linear relations in which a wide variety of constructions with templatic properties can be typologized. Discussing examples from numerous languages, the chapter further explores the relationship between templates and prosodic constituency.

In his contribution, Alan C. L. Yu explores the phonology-morphology interface based on a study of infixation patterns in 112 languages from 26

different families. He discusses the Edge Bias Effect in infixes, which has been claimed to be evidence for morpheme displacement in recent work in Optimality Theory. However, Yu argues that recurrent patterns in the synchronic structure of infixation are rather due to mechanisms of diachronic evolution, and synchronic restrictions in infixation structure can be explained as a by-product of a limited set of possible diachronic pathways leading to the development of infixes.

In a broad typological study surveying consonantal phenomena in 74 languages from 24 language families, Carolina González explores the nature of foot structure, which has been claimed to rely entirely on stress in Metrical Phonology. Her results show that stress and footing can be independent factors, some phenomena being exclusively dependent on stress and some only on footing, while a further group of phenomena is ambiguous between stress and footing. Of particular interest is her discussion of little-known Panoan languages. This leads her to conclude that if typological diversity is taken seriously, stress and foot structure should be treated independently in phonological theory. The separation between stress and foot structure has repercussions not only for phonological, but also for morpho-phonological alternations.

In her chapter on typological and sociolonguistic contributions of tone in Bodish languages, Kristine A. Hildebrandt investigates the complex tonal typology of Tibeto-Burman languages, concentrating on Bodish languages with "word tone". These languages represent a challenge for the assumption, made in general phonological theory and in Sino-Tibetan linguistics in particular, that the syllable is the most prominent prosodic domain. Exploring tone systems in their areal and sociolinguistic contexts, Hildebrandt shows that sociolinguistic factors like diglossia, formal education, and gender can lead to the emergence of tonally different dialects.

The chapters in the section "Morphology, the lexicon, and the structure of words" deal with fundamental questions of morphological and lexical typology from various viewpoints.

Based on an extensive case study of Rembarrnga (Gunwinyguan) polysynthetic structures, Adam Saulwick discusses the possible range of grammatical phenomena that need to be recognized as relevant for a comprehensive typology of polysynthesis. On the one hand, Rembarrnga exhibits many features expected to be found in a highly polysynthetic language, viz. incorporation of adverbials, verbs and nominals, obligatory bound argument affixes, and a high degree of morphological complexity. On the other hand, it also attests rather unique properties, especially the large range of nominals available for incorporation and the occurrence of infinitives,

which have previously been claimed to be incompatible with polysynthesis. The discussion of this language is thus particularly relevant, not only for a comprehensive typology of polysynthesis, but also for its theoretical implications for the relationship between morphological complexity and possible semantics, in particular, the expression of (non-)finiteness.

On the basis of a broad cross-linguistic investigation of suppletion in verb paradigms, Ljuba N. Veselinova demonstrates that even maximally irregular phenomena exhibit recurrent patterns when considered from a cross-linguistic perspective. She further shows that typology can distinguish various types of suppletion, viz. non-categorical suppletion, tense-aspect suppletion, imperative suppletion, and number suppletion, and these can be correlated with particular geographical areas, language families, and specific lexemic groups. In redefining the term suppletion on the basis of cross-linguistic evidence, the chapter also discusses the theoretical status of the notions of paradigm and word.

Bernhard Wälchli shows that the traditional notion of word formation is not appropriate for a functional cross-linguistic approach to compounding and derivation, since it a priori excludes analytic (non-morphological) structures. This is done on the basis of cross-linguistic studies of two phenomena traditionally ascribed to word formation, viz. co-compounds (also called dvandva or coordinating compounds) and light 'again' (also called repetitive or iterative). In analogy to grammatical categories or grams, he develops an alternative approach to phenomena usually subsumed under "word formation", based on the notion of lexical class.

The two chapters in the section "Nominal and verbal morphosyntax in interaction: Transitivity and alignment" address fundamental issues behind the notions of transitivity, inversion, and alignment.

In her contribution, Åshild Næss revisits the notion of transitivity, identifying two different approaches in current typological literature: the prototype approach and the markedness approach. In the former, one criterion for prototypically transitive clauses is the presence of highly individuated, definite and animate objects, whereas in the latter the most natural transitive clauses have objects with relatively low degrees of animacy and definiteness. Næss reviews both approaches in the light of cross-linguistic data, and argues that while there are fundamental differences in their underlying theoretical assumptions and using the same term for both may be problematic, they are not irreconcilable in linguistic theory. She further argues for an analysis of the transitivity concept in terms of iconicity, with the basic principle being that a construction with two distinct, independent argu-

ments is prototypically used to refer to an event with two distinct, independent participants.

Fernando Zúñiga's chapter addresses the relationship of alignment and inversion. Zúñiga gives an overview of different frameworks dealing with inversion and related phenomena, and shows that taking the empirical evidence coming from inversion systems seriously necessarily leads to a modification of current alignment theories, which are based on the better investigated nominative-accusative, ergative-absolutive, and active-stative types. He argues that the typologies of grammatical relations, alignment patterns and inverse constructions are intimately connected but fundamentally different.

The section "Pronominals" features two chapters, both of which address general theoretical and methodological issues through case studies dealing with pronouns and person marking.

Michael Cysouw discusses how his data on person marking in pronouns and affixes, collected in an in-depth survey of world-wide variation, can be represented by semantic maps. Semantic maps are frequently used in the analysis and description of cross-linguistic diversity. They are based on the assumption that cross-linguistically recurrent identity in form means similarity in meaning. He shows that the relationship between data and semantic map is not one to one and that there are many different ways in which semantic maps can be built, differing, among other things, in their degree of coverage and accuracy. He demonstrates how person marking, having attracted wide attention in typology and linguistic theory, is an ideal domain to show the necessity of statistical approaches in typology.

On the basis of case studies dealing with reflexivity and intensifiers in Indo-European, Nicoletta Puddu explores the mutual benefit of typology and comparative linguistics. In discussing the Indo-European "reflexive" stem **se-/s(e)we-* and the Greek and Latin intensifiers *autós* and *ipse*, she shows that where reconstructions are not in accordance with typological generalizations, either the reconstructions or the typology has to be modified. Her contribution shows, concretely, that a closer connection between historical approaches and typology is not only desirable but indispensable.

The three chapters in the section "Verbal and clausal categories" deal with the expression of tense-aspect-mood (TAM), polarity, and some related meanings.

In his contribution dealing with grammaticalization and categorization in the domain of TAM, Gontzal Aldai addresses the passage from grammaticalization data to theoretical generalization paying special attention to the discreteness and non-discreteness of TAM categories. On the basis of a

thorough investigation of the grammaticalization of TAM categories across various diachronic stages of Basque, he discusses the extent to which one form may have more than one TAM meaning and, conversely, one TAM meaning may be expressed by more than one form.

Based on a typological study of standard negation in a representative sample of 297 languages, Matti Miestamo discusses the distinction between symmetric and asymmetric expression of a (marked) category (e.g., negation), as compared to a related (unmarked) category (e.g., affirmation). He also introduces an analogy-based model of explanation to account for the symmetric and asymmetric encoding types in functional terms. He then shows how these principles of classification and explanation can be applied to other functional domains, taking the domain of polar interrogation as an example. The chapter ends with a discussion of the relationship between (a)symmetry and typological markedness.

In her chapter, Jeanette Sakel investigates a new case of a particular type of complex predicates. Her starting point are verbness markers in Mosetén (Mosetenan), a language spoken in the foothills of the Bolivian Andes. She shows that verbness markers in Mosetén are typologically closely related to the so-called coverb-verb constructions in North Australian languages, thus demonstrating that coverb-verb constructions are not just an areal feature of these languages, but a specific type that appears in different parts of the world. The aims of the chapter is manifold: to describe the system of complex predicates in Mosetén, to compare it to typologically similar systems in Australian languages, and to discuss its status in the wider field of complex predicates.

The final section "Complex sentences" consists of two chapters exemplifying two rather different approaches to typology.

In his contribution to the typology of converbs and patterns of clause linkage, Alec Coupe takes Mongsen Ao (Tibeto-Burman, Kuki-Chin-Naga), a language with a particularly rich and intricate system of converb constructions, and its Tibeto-Burman and Indo-European neighbours, as a starting point for the discussion of cross-linguistic correlations. He identifies a number of similarities in various domains of clause linkage suggestive of convergence through contact, and reflects them against the historical context and sociolinguistic setting of Nagaland.

Jean-Christophe Verstraete's chapter deals with the typology of subordination, identifying two types of asymmetry within the complex sentence: asymmetry within the subordinate clause, i.e., internal to it, and asymmetry between the main and subordinate clause, i.e., external to the subordinate clause. The approach is first illustrated with data from Germanic lan-

guages, and it is shown how some problematic issues identified in the literature may be solved with this approach. The discussion is then taken beyond Germanic, to Australian languages, and its usefulness is shown in how it helps to account for the choice of verb form in subordinate clauses. It is argued that this typology of logically possible types is cross-linguistically applicable and helps in solving many issues hitherto unexplained in the literature.

3. Technical issues and presentation

Certain technical issues concerning all chapters are worth mentioning here. The syntax of glossing follows the model of the Leipzig Glossing Rules (LGR), see <http://www.eva.mpg.de/lingua/files/morpheme.html> for details. The abbreviations used in the glosses also mainly conform to the abbreviations recommended in the LGR, but some chapters may slightly diverge from these or have their own additional abbreviations not found in the LGR. The abbreviations used in the glosses are explained in a note in each chapter.

The genealogical affiliation of the languages mentioned are given at first mention of each language in a chapter. These follow the genealogical classification used in *The World Atlas of Language Structures*, see Dryer (2005). In general, both family and genus (but no intermediate levels) are mentioned (in some cases these are identical and the same name is not given twice). The geographical locations of the languages are not given in the chapters, as they can be seen in the map appearing in the Appendix.

4. Acknowledgements

The realization of this volume would not have been possible without the assistance of many experienced colleagues, who devoted much of their time to writing detailed and insighful referee reports on the manuscripts – sometimes as long as the chapters themselves. We would like to thank them all for their support: Bernard Comrie, Nick Evans, Zygmunt Frajzyngier, Larry M. Hyman, Leonid Kulikov, Elena Maslova, Bill McGregor, Edith Moravcsik, Eva Schultze-Berndt, Andrew Spencer, Edward Vajda and thirteen referees who chose to remain anonymous. All chapters in this book have improved considerably from going through this review process. We would also like to thank all authors of the volume not

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References

Dryer, Matthew S.
2005 Genealogical language list. In *The World Atlas of Language Structures*, Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 584–644. Oxford: Oxford University Press.

Part I. Phonology and the interface between phonology, morphology, and syntax

Strong linearity and the typology of templates

Jeff Good

1. Introduction

The term *template* is commonly employed in linguistic description and analysis when salient aspects of the linear arrangement of the subconstituents of some larger constituent appear to be specified independently from syntactic, semantic, or phonological concerns.[1] However, there has been essentially no work on the issue as to whether or not the term is used in a coherent way across the diverse grammatical phenomena to which it has been applied.[2] For example, are Semitic root-and-pattern morphology (McCarthy 1981) and Athapaskan position-class systems (Kari 1989) – both of which have been labeled "templatic" – on some level, the same basic kind of thing? If they are, then we will need to capture the nature of their relatedness in any system we develop for typologizing templates across different languages. If they are not, then we need to develop separate models for the two phenomena and treat the fact they have been given a common label as superfluous.

In Good (2003) I attempted to lay the foundations of a framework for the categorization of different kinds of linear relations, with the goal of being able to use that framework to come to a better understanding of templatic constructions. This paper will highlight those aspects of Good (2003) which I believe to be of most relevance to typological study. As such, the paper will be largely programmatic in nature, though Good (2003) contains not only programmatic elements but also a detailed examination of "templatic" data from three case studies involving diverse morphosyntactic phenomena: Bantu verb suffixes, Chechen verb phrases, and Saramaccan serial verb constructions.

The structure of this paper is as follows. In Section 2, I will introduce the basic framework for classifying linear relations assumed in Good (2003) and give an overview of relevant previous work on templates in different domains of grammar. In Section 3, I will discuss the Strong Linearity Domain Hypothesis, a working hypothesis developed in Good (2003) to help focus research into the properties of templates. An illustrative case

study of a morphosyntactic template, making use of that hypothesis, is given in Section 4. Finally, Section 5 offers a brief conclusion.

Table 1. A Pan-Athapaskan template (adapted from Hoijer 1971: 125)

Slot	Description
1	One or more adverbial prefixes.
2	The prefix for the iterative paradigm.
3	A pluralizing prefix.
4	An object pronoun prefix.
5	A deictic subject prefix.
6	Zero, one or two adverbial prefixes.
7	A prefix marking mode, tense, or aspect.
8	A subject pronoun prefix.
9	A classifier prefix.
10	A stem.

2. Strong linearity and templates

2.1. An informal discussion of the term *template*

As a first approximation, the salient feature common to grammatical elements which are labeled "templatic" is that they can only be described or analysed by making use of extensive stipulations as to how their subconstituents are linearly ordered. This idea comes through quite clearly in, for example, Inkelas's (1993) characterization of morphosyntactic templates (defined in [1c] below) as morphological systems where "morphemes or morpheme classes are organized into a total linear ordering that has no apparent connection to syntactic, semantic, or even phonological organization (Inkelas 1993: 560)."

A typical example of a description making use of the sort of structure described by Inkelas is given in Table 1, which represents a pan-Athapaskan verb template. It schematizes verbs in languages of the family as consisting of a stem (the final element in the verb) preceded by a series of nine prefixal slots, characterized semantically.

However, it is difficult to devise a definition of *template* that neatly encompasses phenomena commonly considered templatic, while excluding more mundane types of linear stipulation. For example, the lexically-specified ordering of segments in a morpheme has not, to my knowledge, ever been described as "templatic", though it is not at all obvious whether such ordering is truly conceptually distinct from the sort of system de-

scribed for the Athapaskan verb in Table 1. Similarly, grammatical categories like *prefix*, *suffix*, *proclitic*, and *enclitic* contain, in their very definition, a minimal kind of linear stipulation: the distinction between "before" and "after". However, this type of stipulation is also not typically described as templatic, though, again, it is not clear what principle may be behind this.

In fact, what seems to distinguish stipulations of linear order given the label templatic from other kinds of linear order stipulations is that they are, in some sense, unexpected (see Good 2003: 22–26). Stipulation of the order of segments in a morpheme is considered "normal" and, therefore, not templatic. Similarly, admitting the existence of a grammatical category like "affix" or "clitic" entails that elements belonging to such categories must have some specification for their linear realization with respect to a host – "before" or "after" are, intuitively, quite natural types of linear stipulation for such elements, and therefore, also not considered templatic.

However, we do not expect – that is, we do not consider it to be the typical or "unmarked" case – that the consonants and vowels of a word will have their linear realization specified independently from the consonants and vowels of the morphemes comprising the word. Thus, the root-and-pattern morphology associated with Semitic languages has been labeled templatic (McCarthy 1981). Similarly, the need to describe an entire morphological system through arbitrarily-ordered position classes, as in Table 1, is unexpected since we typically expect morphology to be "layered" – that is, what is considered normal is for affixes to attach to stems which, in turn, form stems that new affixes can attach to. The ordering relations among morphemes found in the complex but unstructured (i.e., "flat") morphological systems described for Athapaskan languages do not conform to the predictions of this model and are, thus, also open to the label templatic.[3]

2.2. Previous theoretical work on templates

Little theoretical work appears to have been done on templatic phenomena in general. Rather, one finds work limited to particular classes of templates which can be descriptively categorized as phonological, morphophonological, morphosyntactic, or syntactic depending on what kind of constituent the template is analysed as constraining. Informal definitions of these four classes of templates are given in (1).[4] They all involve restrictions on linear realization, though phonological and morphophonological templates pri-

marily involve restrictions on overall linear shape, while morphosyntactic and syntactic templates primarily involve restrictions on linear order.

(1) a. **Phonological template:** A restriction on the phonological patterns of a language stated in terms of allowed combinations of the phonological subconstituents of a given phonological constituent (e.g., allowable segment combinations in syllables, see Itô 1989).

b. **Morphophonological template:** A restriction on the phonological shape of a morphological element, most often a stem or word, stated in terms of the phonological patterns the morphological element is allowed to be associated with (e.g., a minimality restriction on the size of a morpheme, see the discussion of [4c] in Section 3.3).

c. **Morphosyntactic template:** A restriction on the ordering of morphemes in a word stated in terms of "slots" associated with syntactic or semantic categories (e.g., a position class system, see Table 1).

d. **Syntactic template:** A restriction on the ordering of the subconstituents of a syntactic constituent stated in terms of a fixed linear structure not taken to be derived from general syntactic principles (e.g., the ordering domains of Kathol 2000).

I distinguish here between *morphophonological* and *morphosyntactic* templates to avoid ambiguity in the use of the term *morphological*, though both morphophonological and morphosyntactic templates will also often involve what we might call "pure" morphological restrictions – that is, some of their linear realization restrictions will be sensitive to specific morphemes or morpheme classes not definable purely in phonological or syntactic/semantic terms. An example of such morpheme-specific conditioning, in a morphosyntactic template, will be seen in Section 4.2, which gives a case study of the ordering restrictions of several Bantu verbal suffixes.

The most important theoretical work on templates with a cross-linguistic perspective, almost certainly, is that done on morphophonological templates under the rubric of the Prosodic Morphology Hypothesis (McCarthy and Prince 1995 and elsewhere) which "requires that templatic restrictions be defined in terms of prosodic units (McCarthy and Prince 1995: 320)". McCarthy and Prince (1995: 319), in particular, single out the prosodic units of the mora, the syllable, the foot, and the phonological word as possible shapes of morphophonological templates.

We will see in Section 3 that the central hypothesis of Good (2003), the Strong Linearity Domain Hypothesis, is similar to the Prosodic Morphol-

ogy Hypothesis insofar as it also gives prosody a role in restricting the possible forms of templates.

With regard to the other types of templates listed in (1), the most familiar examples of phonological templates are probably syllable templates expressed by sequences like CV, CVC, VC, etc., which, in addition to their use as descriptive devices, have also been used in theoretical work. For example, Itô (1989) makes use of syllable templates to account for certain phenomena involving epenthetic segments (e.g., the epenthesis of vowels to break up consonant clusters in loanwords which are disallowed in a borrowing language but allowed in the donor language).

In addition to a rich descriptive tradition of work making use of morphosyntactic templates (see, e.g., Table 1), theoretically-oriented work on such templates includes Inkelas (1993), Kari (1989), and Simpson and Withgott (1986). Simpson and Withgott (1986) is noteworthy in this context for enumerating a list of properties which they claim distinguish morphosyntactic templates from "layered" morphology. Work like this has not made restrictive typological claims on the possible forms of templates along the lines of the Prosodic Morphology Hypothesis, but it is nevertheless useful in devising possible parameters for a qualitative typology of templatic phenomena.

Work on syntactic templates has been greatly overshadowed by work on hierarchical organization in syntax. Nevertheless, one can find cases of templatic analyses of certain syntactic phenomena. For example, a "precore slot" constructional template proposed by Van Valin and LaPolla (1997: 323) is specified as including a special clause-initial position which could contain, among other things, fronted *Wh*-words of the sort found in English content questions. Also of note, in this context, are traditional analyses of German syntax where sentential linearization is taken to be governed by ordering domains – effectively a type of syntactic position class – which operate independently of hierarchical structure (see Kathol 2000 for a contemporary formalization). However, while one can find such examples of templatic analyses of syntactic phenomena in particular languages, I am not aware of any work on their general typology, or even work of broad cross-linguistic scope.[5]

2.3. Strong linearity and weak linearity

As discussed in Section 2.1, an apparently crucial feature of phenomena labeled templatic is that they exhibit unexpected linear stipulations. This

makes working with the term in a rigorous way difficult since, without a separate theory of linguists' expectations for linear stipulations, it is not possible to know when a given phenomena should truly be labeled templatic. In order to deal with this issue, Good (2003) develops a new framework for classifying linearization phenomena, which is intended to serve as a foundation for the development of a general theory of templates, while avoiding the more problematic aspects of the term's use. The core of the framework rests on making an a priori distinction between *strong* and *weak* linearity, as in (2).

(2) a. **Weak linearity:** Grammatically predictable linear relations holding among a set of linguistic constituents.
b. **Strong linearity:** Grammatically unpredictable linear relations holding among a set of linguistic constituents.

These definitions are deliberately vague in many respects in order to be as theory independent as possible. For example, the term *constituent* should be understood broadly to mean a phonological, morphological, or syntactic constituent. Similarly, the notion of grammatical predictability is intended to be agnostic as to just what constitutes both "grammatical" and "predictable". In principle, *grammatical*, in this context, could include phonological and lexical phenomena, in addition to morphological or syntactic ones. By *predictable*, I simply mean cases where one can explain a given linear pattern as a direct consequence of some other independently-motivated generalization. More specific interpretations of *grammatically predictable* will, of course, be highly dependent on the theoretical approach one adopts.[6]

Importantly, while the classification of a given linearization pattern as strong or weak may be theory dependent, it seems unlikely that any grammatical theory could dispense with the distinction entirely. For example, it would be difficult (if not impossible) to analyse linear minimal sets like *pat*, *tap*, and *apt* in English without suggesting that some of the linear relations holding among the segments in those lexical items are unpredictable and, hence, strong. Similarly, every grammatical theory would predict, in one way or another, that at least the descriptive intuition encoded by Bybee's (1985) relevance principle would hold – that is, "that words that function together in the sentence tend to occur together in the sentence (Bybee 1985: 39)". Whatever linearization patterns one attributes to such a principle would be predictable on the basis of it and, hence, weak.

Where one draws the line between strong and weak linearity in a given constituent is necessarily a matter of analysis, but it is hard to imagine any grammatical framework not invoking both kinds of linearity on some level. Distinguishing between strong and weak linearity can play a crucial role in refining our understanding of templates since, as we have seen, what is "special" about templatic phenomena is the nature of their strong linearity. In Section 4, we will see how making this distinction will help us come to a better understanding of one specific template found in the Bantu verb stem.

3. Generalizing and constraining templates

3.1. Introducing the Strong Linearity Domain Hypothesis

Good (2003) was focused primarily on morphosyntactic templates. However, an important general theme of the work – and the one of primary consideration here – was developing a model for a general typology of templates. Good (2003) proposed that an exploration of this typology can be usefully framed by the Strong Linearity Domain Hypothesis, given in (3). The term *domain* in the Strong Linearity Domain Hypothesis refers to any linguistic constituent (broadly construed) over which strong linear restrictions apply.

(3) **Strong Linearity Domain Hypothesis**: The boundaries of any strong linearity domain must be coextensive with a prosodic constituent, and its non-predictable linear relations must be consistent with the characteristic phonology of that prosodic constituent.

Before moving forward, it is worthwhile to discuss what sort of hypothesis the Strong Linearity Domain Hypothesis is intended to be. While it certainly could be interpreted as a statement of some formal linguistic universal, in my view, it is better understood as a working hypothesis. That is, what is important about it is not so much if it is correct but, rather, the ways in which it can help focus analyses of templatic constructions so as to allow us to get a better understanding of their typological properties.

As formulated, the Strong Linearity Domain Hypothesis makes no specific reference to templates. Rather, it is a hypothesis regarding the broader phenomenon of strong linearity. However, informally speaking, we can say that what is interesting about templatic phenomena is that they have "too much" strong linearity. Thus, if we gain a deeper understanding of the na-

ture of strong linearity, we will likely have made a substantial step towards coming to a general understanding of templates, as well. Thus, a hypothesis like the Strong Linearity Domain Hypothesis should be of interest here.

The Strong Linearity Domain Hypothesis suggests that strong linearity domains should be linked to two aspects of a language's phonology: prosodic constituents and characteristic phonologies. I discuss each of these things in turn in the following sections. In Section 3.4, I will briefly discuss the motivation for the Strong Linearity Domain Hypothesis.

3.2. Prosodic constituency

Broadly speaking, prosodic phonology is the study of phonological constituency. The most well-known theoretical approaches to prosodic phonology, like those of, for example, Nespor and Vogel (1986) and Selkirk (1984) are based on two distinct theoretical claims. The first is that prosodic categories are universal, limited to items like *syllable*, *foot*, *phonological word*, *intonational phrase*, etc. (see, for example, Nespor and Vogel 1986). The second is that phonological constituency obeys the Strict Layering Hypothesis (Selkirk 1984: 26–27), which can be informally understood as a statement that phonological constituency must be representable as a well-formed tree.

Neither claim is unproblematic. Inkelas (1993) and Downing (1999), for instance, argue for models where metrically-defined prosodic constituents – like the syllable and foot – below the level of the phonological word are augmented by a parallel class of morphologically-oriented prosodic constituents (e.g., the *prosodic stem*). Similarly, Inkelas and Zec (1995: 548–549) discuss how analyses of the phrasal phonology of different languages do not unequivocally support the Strict Layering Hypothesis.

In Good (2003) and, here, in Section 4.4, I take an empirically-oriented approach towards identifying prosodic constituents. A unit is treated as a prosodic constituent if at least one, and ideally a number of, phonological generalizations target that unit as the domain over which they apply. Such an approach is not inherently incompatible with approaches positing a restricted, universal set of prosodic categories. However, as applied to a particular language, it might make claims which are incompatible with them.

3.3. Characteristic phonology

While prosodic constituency has been discussed in the literature for some time, the second core notion of the Strong Linearity Domain Hypothesis, the *characteristic phonology* of a prosodic constituent, was new to Good (2003). Informally speaking, it should be relatively easy to understand what is meant by the term: a given prosodic constituent should have a recognizable set of phonological characteristics and its *characteristic phonology* simply encompasses that set of characteristics.

As an example, consider the phonological word in Turkish (Altaic, Turkic). The generalizations in (4) apply to this prosodic constituent in the language (see Lewis 1967: 15–24 and Inkelas and Orgun 1995: 773).

(4) a. The Turkish word is a vowel harmony domain.
b. The Turkish word receives final accent.
c. The Turkish word is minimally bimoraic.

We can, thus, say that the characteristic phonology of the Turkish phonological word is at least the sum of the three characteristics seen in (4).

There are two important points to be made about the generalizations in (4). First, they are not exceptionless. To pick one example, there are numerous cases of words not receiving final stress (Lewis 1967: 21–24). Such violability is, in fact, central to the notion of characteristic phonology, which should be understood as representing a prototype rather than a strict set of requirements.

The second important point to be made about the generalizations in (4) relates to generalization (4c). There is a good case to be made that the constraint that words in Turkish are minimally bimoraic is not active at the level of the prosodic word, but, rather, at the level of the prosodic root (Inkelas and Orgun 1995: 773–781). However, if a root must be minimally bimoraic, then a word must necessarily also be minimally bimoraic. Bimoraicity, then, becomes part of the characteristic phonology of the word even though it is not a "word-level" restriction. This illustrates the general point that it should not be assumed that the properties of a given characteristic phonology must derive directly from a constraint/rule that manifests itself directly within the domain of the relevant prosodic constituent.

The Strong Linearity Domain Hypothesis states, somewhat vaguely, that "non-predictable linear relations must be consistent with the characteristic phonology of that prosodic constituent". How should the word *consistent* be interpreted? Good (2003: 47–48) explicitly skirts the problem of

developing general criteria for this sort of consistency and restricts claims regarding consistency to language-specific templatic phenomena. While such ad hoc methodology would clearly be problematic in the context of a long-term research programme on the typology of strong linearity making use of the Strong Linearity Domain Hypothesis, at preliminary stages of study it seems to be a necessity, since it is only by an examination of specific cases that we can devise an initial catalog of different types of consistency which will inform the development of a broad typology. Section 4 will contain discussion on how one instance of strong linearity was argued to be consistent with the characteristic phonology of the relevant prosodic constituent.

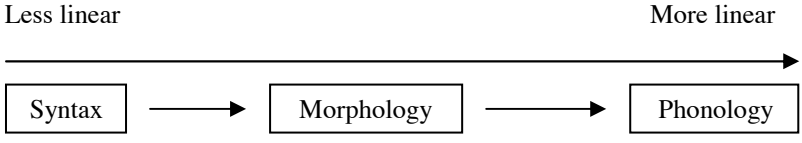

Figure 1. Clinal nature of linearity restrictions, from a descriptive perspective

3.4. The motivation behind the Strong Linearity Domain Hypothesis

The logic behind proposing a hypothesis connecting strong linearity to prosodic phonology is not necessarily obvious. Therefore, I will briefly describe the motivations underlying the formulation of the Strong Linearity Domain Hypothesis here. They derive in large part from the rough, descriptive model of grammar given in Figure 1. The model schematized in Figure 1 is intended to express the idea that phonological constituents can generally be more detailed in their linear specifications than morphological constituents, which, in turn, can be more detailed in their linear specifications than syntactic constituents. For example, prototypically we think of phonological constituents as possibly containing quite elaborate specifications of the order of their subconstituents (e.g., of the segments in a syllable), while syntactic constituents generally make use of much simpler linear specifications involving only basic notions like "before" or "after" (as in, e.g., "the object appears *before* the verb"). Morphology, of course, lies in between these two extremes.

Assuming a model like the one schematized in Figure 1, the leading idea behind the Strong Linearity Domain Hypothesis is this: If strong line-

arity restrictions represent unpredictable linear relations in some constituent, we should look to the more "linear" aspects of grammar in trying to understand the source of such restrictions. The hypothesis, therefore, connects strong linearity to phonology, a relatively linear aspect of grammar, in an attempt to address two important questions: (i) where strong linearity should be found (prosodic constituents) and (ii) what it should look like when it is found (the characteristic phonology of that constituent).

In the next section I give a case study of the application of the Strong Linearity Domain Hypothesis to the analysis of a particular template in order to illustrate its potential value as a tool for the general study of templates.

4. A case study of "templatic" strong linearity

4.1. Introduction

Given that typological investigation into the general structure of templates is only in its early stages, a useful methodological approach is the use of illustrative case studies. Of course, the set of cases one initially examines might ultimately turn out to be misleading in one way or another. However, as long as one takes this into account, such studies can clearly serve as worthwhile tools in making an initial exploration of a given typological space.

In this section, I will present a case study of a templatic phenomenon involving verbal suffix ordering in Bantu, showing how it can be analysed as consistent with the Strong Linearity Domain Hypothesis, while, at the same time, illustrating how the application of the hypothesis to a particular templatic pattern can gives us insights into its structure that might otherwise go unnoticed. This case study is drawn from Good (2003: 107–274). Related discussion is found in Hyman (2003) and Good (2005). These works are able to examine the data underlying important descriptive generalizations about the Bantu template to an extent that is far greater than what is possible here.

4.2. Overview of the Bantu data

Bantu languages are well known for making use of verbal suffixes which alter the basic valence and semantics of verb roots. Two such suffixes, the

Causative, reconstructed as **-ic-* (with forms like *-its-*, *-is-*, or *-ish-* as typical reflexes), and the Applicative, reconstructed as **-id-*, with forms like *-ir-* and *-il-* as typical reflexes), are exemplified from Chichewa in (5) and (6), respectively. Throughout, I use capitalized terms like "Causative" to refer to particular Bantu suffixes and lower-case terms like "causative" to refer to the functions of those suffixes.[7]

(5) Chichewa (Niger-Congo, Bantoid; Baker 1988: 10)
Mtsikana *a-na-gw-**ets**-a* *mtsuko.*
1.girl 3S-PST-FALL-**CAUS**-FV 3.waterpot
'The girl made the waterpot fall.'

(6) Chichewa (Niger-Congo, Bantoid; Alsina and Mchombo 1993: 18)
Chitsîru *chi-na-gúl-**ír**-á* *atsíkána* *mphátso.*
7.fool 7-PST-buy-**APPL**-FV 2.girl 9.gift
'The fool bought a gift for the girls.'

In (5) the Causative *-ets-* appears after *-gw-* 'fall', giving causative semantics to the verb, as well as shifting its valence from intransitive to transitive. In (6) the Applicative *-ir-* allows the verb *-gúl-* 'buy' to take two unmarked objects instead of one, with the benefactive object *atsíkána* 'girl' acting as the "added" argument.

In many Bantu languages, a single verb root can be both causativized and applicativized. One way in which this is marked can be seen in the Chichewa example in (7) where a Causative and Applicative (in that order) both appear on the same verb stem.

(7) Chichewa (Niger-Congo, Bantoid; Sam Mchombo, p.c.)
*Ti-na-mang-**its**-**ir**-a* *atsikana* *alenje* *mbuzi.*
1P-PST-tie-**CAUS**-**APPL**-FV 2.girl 2.hunter 10.goat
'We made the hunters tie the goats for the girls.'

In addition to the Causative, in many Bantu languages, there is another suffix, here labeled the Transitive, which can also play a role in causative-marking. The Transitive is reconstructed as **-i̯-* (where *i̯* represents the highest front vowel in a seven-vowel system), and its typical reflexes are either a *-y-* glide or a mutation of the consonant it would have followed historically (or a combination of the two). Therefore, it does not always have a segmental reflex (see Good 2005: 9–12). An example of the Transitive, alternating with the Causative, from Runyoro-Rutooro, is given in (8).

(8) Runyoro-Rutooro (Niger-Congo, Bantoid; Bastin 1986: 116)

-og-a	'bathe-FV'	'bathe'
*-og-**y**-a*	'bathe-**TRANS**-FV'	'wash'
*-og-**is**-a*	'bathe-**CAUS**-FV'	'make wash'

As seen in (8), in Runyoro-Rutooro the Transitive is associated with direct causation and the Causative with indirect causation. The distinct uses of these suffixes seen in languages like Runyoro-Rutooro is what motivates the choice of the terms Transitive and Causative here. However, most Bantu languages do not show such a clean semantic split in the use of the suffixes, and their distribution can be quite complicated (see Good 2005: 9–12). From a cross-Bantu perspective, it is best to consider the function of both as marking general causativization.

There are three common patterns for the morphological exponence of causativization involving these suffixes, two straightforward ones where either the Causative or the Transitive appears on a given verb (with the choice potentially governed by semantic, lexical, or phonological factors) and an additional more complex pattern where both the Causative and Transitive appear (in that order) on the verb stem. This latter pattern can be found in Meru (also called Kimeru), for example, and is illustrated in (9) (glossing adapted and extended from original source). This example additionally shows that the Applicative generally appears between the Causative and Transitive when all three appear on the same verb stem.

(9) Meru (Niger-Congo, Bantoid; Hodges 1977: 118)

*Ni-a-or-**ɟth**-**iir**-**ɟ**-e*	*muntu*	*arɟtwa*
FOC-3S-spank-**CAUS-APPL-TRANS**-FV	1.person	2.student

'He caused the students to be spanked for the person.'

Hyman (2003) and Good (2005) present extensive evidence that a template plays an important role in determining possible orders in which the Causative, Applicative, and Transitive suffixes can appear on a single verb stem. For present purposes, this template can be schematized as in (10).

(10) CAUSATIVE (**-ic-*) > APPLICATIVE (**-id-*) > TRANSITIVE (**-ɟ-*)

The schema in (10) represents a claim that, if multiple suffixes are present, the Causative must precede the Applicative which, in turn, must precede the Transitive. I will abbreviate this templatic pattern as CAT. In some languages, not all of these suffixes are productively employed – for

example, the Transitive is no longer productive in Chichewa. In such cases, the suffixes found in a given language will still generally follow the subset of the CAT pattern applicable to them. In the Chichewa case, for example, the order CA, a subset of the CAT pattern, is allowed (see, e.g., [7]) but AC order is not.

The primary pieces of evidence for the template in (10) are the attested ordering possibilities for these morphemes across Bantu languages. Good (2005: 33–37), for example, presents the results of a survey of thirty-two Bantu languages, spread over most of the Bantu-speaking area, with respect to relative-order possibilities for the Causative, Applicative, and Transitive. Of those, only four (the Korekore dialect of Shona, Makua, Bukusu, and Xhosa) were found to productively allow a non-CAT order, with each allowing AC order. However, even for those languages, the uses of AC order were quite restricted as compared to the uses of CA order. For example, in Korekore AC order is used productively only in infinitival relative constructions (Dembetembe 1987: 78). (See Good 2005: 33–37 for further discussion.) Further evidence for the template given in (10) is discussed in Hyman (2003) and Good (2005).

4.3. Strong linearity in the Bantu verb stem

In the previous section, I used the abbreviation CAT to describe the Bantu suffixing ordering template. However, in the present context, it is important to understand just how the CAT "template" translates into strong linearity restrictions. In (11) I give one possible such characterization.

(11) a. The Causative cannot directly follow the Applicative.
b. The Transitive cannot be followed by any -VC- suffix.

An important aspect of (11) is that the restrictions are characterized in terms of specific Bantu morphemes and not, for example, in terms of a general class of causative or applicative morphemes. I take the linear order restrictions of these Bantu suffixes to be morpheme-specific and only indirectly related to their semantic content. I will come back to this issue in Section 4.5.

Another important aspect of the restrictions in (11) is that they are given as "atomic" ordering statements rather than as a monolithic statement covering all ordering possibilities. This will facilitate the comparison of dif-

ferent aspects of the template with different aspects of the characteristic phonology of the verb stem in Section 4.4.

Clearly, there could be other ways to characterize the strong linearity restrictions encoded by the CAT template than those given in (11). As we will see in Section 4.4, these particular restrictions can be understood to be consistent with the Strong Linearity Domain Hypothesis, which is the principle reason why they have been chosen here. In fact, one of the benefits of applying the hypothesis to specific cases of templates is that it forces their properties to be described with a higher degree of precision than might otherwise be done. Of course, these more precise descriptions may turn out to be inaccurate. But even such a negative discovery will still represent an advance over our previous understanding of the template in question.

4.4. The Bantu verb stem and the Strong Linearity Domain Hypothesis

In order to determine whether or not the strong linearity restrictions given in (11) match the predictions of the Strong Linearity Domain Hypothesis we must establish two things: (i) that the Bantu verb stem is a prosodic constituent and (ii) that these strong linearity restrictions are consistent with the characteristic phonology of that constituent.

Establishing the first point is not particularly difficult. As Hyman (1993: 25) writes in a survey of the Bantu verb stem, "apparently all Bantuists agree that the verb stem is distinguished by phonological characteristics...". He then gives a number of these characteristics, some of which are adapted in (12).

(12) a. Vowel height harmony is observed in some Bantu languages within (but not outside of) the verb stem.
b. Vowel coalescence often applies differently within the verb stem than it does elsewhere.
c. All vowels between the initial vowel of the verb stem and the obligatory Final Vowel are underlyingly toneless.

The discussion above focused on the combination of a verb root followed by valence-changing suffixes. However, the relevant prosodic unit, which will be referred to here as the *prosodic verb stem*, is generally taken to also include an inflectional Final Vowel found at the end of the verb, and this will be the prosodic constituent I will employ in the analysis to follow.

(This vowel can be seen in the examples in Section 4.2 containing full verb forms.)

So, the idea that the Bantu verb stem is coextensive with a prosodic constituent seems uncontroversial. However, establishing that the strong linearity restrictions, as given in (11), are consistent with the characteristic phonology of the verb stem is more difficult, not least because, unlike prosodic constituency, the notion of consistency with a characteristic phonology is new to this line of research. The first step is to give a description of the relevant properties of the prosodic verb stem's characteristic phonology. A schematization of these properties is given in Table 2. (In Table 2, Y represents a glide.)

Table 2. Schematization of the shape of Bantu verb stems

Stem Type	Shape			
Minimal	-CVC-	-V		
	ROOT	FV		
Extended	-CVC-	-VC-	-V	
	ROOT	CAUS/APPL	FV	
Further extended	-CVC-	-VC-	-Y-	-V
	ROOT	CAUS/APPL	TRANS	FV

The schematization in Table 2 is intended to describe Proto-Bantu. Therefore, it will not cleanly apply to all Bantu languages. It indicates that the typical shape of a verb root in Bantu is -CVC- (though exceptions to this pattern seem to have existed even in Proto-Bantu) (Meeussen 1967: 85–89). With the addition of the inflectional vowel, this gives the verb stem the prototypical shape CVCV.

As seen, extensions with shape -VC-, like the Causative and Applicative, extend this basic shape and maintain the overall CV pattern. The Transitive, when added, can alter this basic shape somewhat when it surfaces as a vowel, for example as in Meru (see [9]), or even when it surfaces, more typically, as a glide (as in the Runyoro-Rutooro data in [8]), by creating a complex Cy towards the end of the verb stem. But even then, the overall CV pattern is maintained throughout the interior of the stem, and the alteration of the pattern at the edge of the stem is itself not particularly drastic.

Based on the descriptive generalizations schematized in Table 2, in (13), I give a characterization of the characteristic phonology of the Bantu verb stem, limited to characteristics that are relevant to the present discussion.

(13) a. **Morphophonologically bounded:** Prototypically, the verb stem has disyllabic shape CVCV. Deviations typically involve suffixation.
b. **Shape follows CV pattern:** Even though the root itself may have a shape like CVC, the nature of Bantu morphophonology means the surfacing stem will have a shape like CVCV.

Each of the two strong linearity restrictions given in (11) can be understood as being roughly comparable to one of the properties of the characteristic phonology of the verb just given in (13). The statement in (14a) connects restriction (11a) to phonological characteristic (13a), and the statement in (14b) connects restriction (11b) to phonological characteristic (13b).

(14) a. **CAT restricts the expansion, and, thus, the size, of the stem:** By imposing a restriction that the Causative cannot follow the Applicative, the morphological possibilities for stem expansion become more limited, consistent with phonological characteristic (13a) that the stem is morphophonologically bounded.
b. **CAT maintains CV pattern:** The -VC- shape of the Causative and Applicative suffixes maintains the CV pattern of the verb "naturally". The surfacing of the Transitive suffix towards the end of the stem ensures the pattern will be maintained throughout the interior of the stem, consistent with phonological characteristic (13b).

As seen in (14), there are clear parallels between the characteristic phonology of the prosodic verb stem and its strong linearity restrictions – the prosodic verb stem is relatively "small" and restriction (11a) limits stem expansion. The prosodic verb stem follows a CV pattern and restriction (11b) "conspires" to maintain that pattern. In my own view, these strong linearity restrictions can, therefore, be understood to be consistent with the characteristic phonology of the prosodic verb stem, and they are, therefore, in accord with the Strong Linearity Domain Hypothesis.

4.5. Why CA and not AC?

An important question left open by the analysis just presented is why the order of the Causative and Applicative is fixed as CA instead of AC. The Strong Linearity Domain Hypothesis gave us some insight into the nature

of the form of Bantu verb suffix template but, by its very nature, it has little to say about syntactic and semantic aspects of templatic restrictions. In Good (2003: 262–272) and Good (2005: 46–48), a historical explanation for this aspect of the template was offered based on the observation that crosslinguistic evidence indicates that, all things being equal, a causative is likely to grammaticalize (in temporal terms) before an applicative.

Since the Bantu Causative and Applicative have a similar shape, we can hypothesize that they developed from similar sources (perhaps from post-verbal auxiliaries [Givón 1971]), in which case the fact that the template has order CA instead of AC could be a byproduct of the Causative grammaticalizing before the Applicative, with each following a similar grammaticalization path. Of course, the Transitive has a causative function as well – and appears after the Applicative in the template. But the shape of the Transitive is quite distinct from the shape of the Causative and Applicative, suggesting it developed along a different grammaticalization pathway, making the relative chronology of its grammaticalization less relevant here. (Hyman 2003: 262 suggests the source of the Transitive may have been as a voice marker of some kind.) There is, of course, a good degree of speculation in all of this. Nevertheless, it points to a possible explanation for properties of the Bantu template not covered by the above analysis: differential timing and pathways of grammaticalization.

4.6. Prospects

While I have only been able to present the basic outlines of how the Strong Linearity Domain Hypothesis can be used in the analysis of a template here, this case study illustrates how the application of hypothesis can play a role in refining our understanding of templates generally. For example, in this particular instance, attempting to understand the CAT template by characterizing its strong linearity restrictions – and seeing if those restrictions were consistent with the Strong Linearity Domain Hypothesis – led to an interesting conclusion: For the Bantu verb suffixes, it was important to distinguish between restrictions particular to language-specific morphemes and grammaticalization patterns affecting broad functional classes of morphemes. Each played a role in accounting for the template, with the former having a central role in explaining the template's form and the latter having a role in explaining the functional distribution of template's morphemes.

Whether or not this suggests a general principle for the analysis of comparable types of templatic phenomena is an open question. However,

given that the Strong Linearity Domain Hypothesis was developed primarily as a working hypothesis, the fact that its application caused this issue to be raised at all is of most interest here. In particular, this case study suggests a possible methodological principle in the analysis of templates: Formal aspects of their linear ordering may require a different kind of account than functional aspects. While such a principle may not be particularly surprising, I do not believe it has been explicitly formulated elsewhere – and, it, perhaps, marks a small advance in our understanding of templatic phenomena.

5. Conclusion

In this paper, I have outlined some of the general issues surrounding the development of a general typology of templatic constructions. Unlike, say, word order patterns, the basic categories we should start with in developing such a typology are not immediately obvious, and it was suggested that, we should begin by focusing not on "templates", per se, but rather on strong linearity – an important feature of templates.

The case study of Bantu verbal suffixes given here presented at least two methodological principles which could be applied to future study of templatic phenomena. The first is that it may be important not to analyse templates monolithically, but, rather, to break them down into lower-level statements of stipulated linear ordering restrictions. The second is that the modes of explanation we may need to come to an understanding of the formal structure of templates may be quite distinct from the modes of explanation required to understand the functional categories expressed by the elements within them.

I would like to conclude by highlighting what I believe to be a particularly intriguing idea coming out of this study, introduced in Section 2, but which was not focused on – that the unifying characteristic of templates is not simply that they involve stipulations of linear order but, rather, that they involve *unexpected* stipulations of linear order. If there is truth to this characterization, it forces us to address the general question: What sorts of stipulated linear patterns do we expect in different types of constituents? To the best of my knowledge, this question has not been addressed systematically (though there are, of course, relevant proposals for particular aspects of grammar, like syntax or morphology). Dealing with the issues this question raises in a general way would seem likely to yield interesting results in the study of many types of syntactic, morphological, phonological,

and lexical patterns. This suggests that coming to better understanding of what makes a template a "template" may also help us to come to a better understanding of phenomena which would never be called "templatic".

Notes

1. I would like to thank Larry Hyman, Andrew Garrett, and Johanna Nichols for serving as advisers on the dissertation on which this work is based. Sharon Inkelas, John McWhorter, Masha Polinsky, Rich Rhodes, Bill Weigel, and Alan Yu also deserve thanks for their input on that work. More recently, Tom Güldemann, the editors, two reviewers, and audiences at the University of Pittsburgh, the MPI for Evolutionary Anthropology, and the 2006 LSA Annual Meeting also gave valuable comments on this work. Due to limitations of space, I was not able to address many worthwhile remarks made on earlier versions of this paper.
2. In this paper, I am only concerned with linear realization templates – that is, templates used to account for the linear realization of the subconstituents of a given constituent. While this is the most prominent use of the term within linguistics, other uses can be found. For example, the constructional templates of Van Valin and LaPolla (1997), discussed in Section 2.2, are used to account not only for linearization phenomena but also other grammatical properties of a constituent. The usage of template in such a context seems to reflect the general, non-linguistic use of the word *template*, to mean something like "pattern".
3. I should point out in this context that, while the examples of templates given in this section involve linear order, there is another possible linear dimension which can be relevant for templatic restrictions, phonological length. That is, the "unexpected" linear parameter could be one wherein a given unit is stipulated as having to have some particular phonological size. Minimality restrictions, wherein, for example, words in a language must always be minimally of a certain length – e.g., two moras or syllables – fall into this class of templates. Such a minimality restriction, found in Turkish, will be discussed in Section 3.3.
4. So-called clitic clusters (Simpson and Withgott 1986) clearly can also be considered templatic, though they do not fit cleanly into the enumeration of template types given in (1) since they can straddle the boundary between morphosyntactic and syntactic templates. The difficulty in categorizing them as "morphological" or "syntactic" is independent from the fact that they are templatic. Therefore, in principle, they should also be considered to be testing grounds for the Strong Linearity Domain Hypothesis, discussed in Section 3.

5. Superficially, syntactic constructions, in the sense of Construction Grammar (see, e.g., Kay and Fillmore 1999) often appear to be possible instances of templates, and some, like the "precore slot" template Van Valin and LaPolla (1997: 323) are clearly analysed as such. However, as discussed in Good (2003: 390–395), determining whether or not a given construction is "templatic" first requires having a detailed analysis of the source of linearization patterns in the construction. There may be some relationship between constructions and templates, but they do not cleanly correlate.
6. A striking recent example of how theoretical attitudes can crucially affect whether or not some set of linear relations are predictable – and, therefore, weak or strong – can be found in Rice (2000), which argues that, contrary to traditional descriptions, the ordering of prefixes in the Athapaskan verb "template" (see Table 1) is predictable on syntactic grounds, and it, therefore, is not truly exhibiting strong linearity but, rather, weak linearity.
7. Glossing abbreviations are as follows: APPL Applicative, CAUS Causative, FOC focus, FV Final Vowel, P plural, PST past, S singular, TRANS Transitive. Numbers refer to person and Bantu noun classes.

References

Alsina, Alex, and Sam A. Mchombo
1993 Object asymmetries and the Chichewa applicative construction. In *Theoretical Aspects of Bantu Grammar*, Sam A. Mchombo (ed.), 17–45. Stanford: Center for the Study of Language and Information.

Baker, Mark
1988 *Incorporation: A Theory of Grammatical Function Changing*. Chicago: University of Chicago.

Bastin, Yvonne
1986 Les suffixes causatifs dans les langues bantoues. *Africana Linguistica* 10: 55–145.

Bybee, Joan
1985 *Morphology: A Study of the Relation between Meaning and Form*. Amsterdam: Benjamins.

Dembetembe, N. C.
1987 *A Linguistic Study of the Verb in Korekore*. Harare: University of Zimbabwe.

Downing, Laura J.
1999 Prosodic stem ≠ prosodic word in Bantu. In *Studies on the Phonological Word*, T. Alan Hall, and Ursula Kleinhenz (eds.), 73–98. Amsterdam: Benjamins.

Givón, Talmy
1971 On the verbal origin of Bantu verb suffixes. *Studies in African Linguistics* 2: 145–164.
Good, Jeff
2003 Strong linearity: Three case studies towards a theory of morphosyntactic templatic constructions. Ph. D. diss., Department of Linguistics, University of California, Berkeley.
2005 Reconstructing morpheme order in Bantu: The case of causativization and applicativization. *Diachronica* 22: 3–57.
Hodges, Kathryn Speed
1977 Causatives, transitivity and objecthood in Kimeru. In *Papers from the Eighth Conference on African Linguistics*, Martin Mould, and Thomas J. Hinnebusch (eds.), 113–125. Studies in African Linguistics, Supplement 7.
Hoijer, Harry
1971 Athapaskan morphology. In *Studies in American Indian Languages*, Jesse Sawyer (ed.), 113–147. Berkeley: University of California.
Hyman, Larry M.
1993 Conceptual issues in the comparative study of the Bantu verb stem. In *Topics in African Linguistics*, Salikoko S. Mufwene, and Lioba Moshi (eds.), 3–34. Amsterdam: Benjamins.
2003 Suffix ordering in Bantu: A morphocentric approach. In *Yearbook of Morphology 2002*, Geert Booij, and Jaap van Marle (eds.), 245–281. Dordrecht: Kluwer.
Inkelas, Sharon
1993 Nimboran position class morphology. *Natural Language and Linguistic Theory* 11: 559–624.
Inkelas, Sharon, and Orhan Orgun
1995 Level ordering and economy in the lexical phonology of Turkish. *Language* 71: 763–793.
Inkelas, Sharon, and Draga Zec
1995 Syntax-phonology interface. In *The Handbook of Phonological Theory*, Goldsmith, John A. (eds.), 535–549. Oxford: Blackwell.
Itô, Junko
1989 A prosodic theory of epenthesis. *Natural Language and Linguistic Theory* 7: 217–260.
Kari, James
1989 Affix positions and zones in the Athapaskan verb. *International Journal of American Linguistics* 55: 424–455.
Kathol, Andreas
2000 *Linear Syntax*. Oxford: Oxford University.

Kay, Paul, and Charles J. Fillmore
1999 Grammatical constructions and linguistic generalizations: The what's X doing Y? construction. *Language* 75: 1–33.
Lewis, Geoffrey L.
1967 *Turkish Grammar*. Oxford: Oxford University.
McCarthy, John
1981 A prosodic theory of nonconcatenative morphology. *Linguistic Inquiry* 12: 373–418.
McCarthy, John, and Alan Prince
1995 Prosodic morphology. In *The Handbook of Phonological Theory*, Goldsmith, John A. (eds.), 318–366. Oxford: Blackwell.
Meeussen, A. E.
1967 *Bantu Grammatical Reconstructions*. Tervuren: Tervuren.
Nespor, Marina, and Irene Vogel
1986 *Prosodic Phonology*. Dordrecht: Foris.
Rice, Keren
2000 *Morpheme Order and Semantic Scope: Word Formation in the Athapaskan Verb*. Cambridge: Cambridge University.
Selkirk, Elisabeth
1984 *Phonology and Syntax: The Relation between Sound and Structure*. Cambridge, Mass.: MIT.
Simpson, Jane, and Meg Withgott
1986 Pronominal clitic clusters and templates. In *Syntax and Semantics 19: The Syntax of Pronominal Clitics*, Hagit Borer (ed.), 149–174. New York: Academic Press.
Van Valin, Robert D. Jr., and Randy J. LaPolla
1997 *Syntax: Structure, Meaning, and Function*. Cambridge: Cambridge University.

The Phonology-Morphology Interface from the perspective of infixation

Alan C. L. Yu

1. Introduction

The nature of the interaction between phonology and morphology has gained renewed interests in the phonological literature in recent years.[1] The advent of Optimality Theory (OT) in particular has driven many researchers to rethink earlier assumptions about the nature of the Phonology-Morphology Interface. For example, the rejection of serialism and the strict adherence to only two levels of representations have prompted new investigations on opacity and the need for intermediate representations (e.g., Hermans and van Oostendorp 1999; McCarthy 1999); OT's emphasis on output wellformedness raises questions on the need for underlying representations itself (e.g., Burzio 2005; Flemming 1995). This paper focuses on one such area of debate, namely, the extent of influence the phonological component may exert on morphology. Within traditional OT, phonological constraints interact with morphological ones directly. The integration of constraints grants phonology a much stronger hand over morpheme realization than any previous theories have assumed. The most drastic consequence of this integration can be observed in the area of affix placement. In particular, phonological considerations may determine the linear position of an affix relative to a stem, often time in direct conflict with the underlying subcategorization restriction of the affix. Infixation is hailed as the prime example of such a heavy-handed interaction. The linear position of an infix with respect to the domain of affixation is seen as a complex interaction between the shape of the infix and the general phonotactics of the language. For example, while the actor focus marker, *-um-*, in Tagalog (Austonesian, Meso-Philippine) is assumed to be underlyingly a prefix, it is realized as an infix (e.g., *sulat* 'to write' ~ *s-um-ulat*/ **um-sulat*) due to constraints against coda consonants (McCarthy and Prince 1993a) or onsetless syllables (Orgun and Sprouse 1999).

This paper argues that this kind of encroachment of the phonological component into the domain of affix placement is neither necessary nor

sufficient to account for the phenomenon it proposes to explain. In particular, typological evidence reveals no empirical support for such a movement-based analysis of infixation. The distribution of infixes within the domain of affixation is better explained by their diachronic origins. This issue gains renewed urgency in the context of current debate concerning the division of labour between diachronic and synchronic explanations. Many current theories of infixation, and of grammar in general, assume that, all else being equal, naturalness and universal typological tendencies in phonology and morphology should be captured in the theory of grammar itself in order to attain explanatory adequacy. From this point of view, the theory of grammar not only should "account" for what is found in language, but also "explain" the source of the variations. Such an all-encompassing view of grammar is not without detractors, however. Many linguists argue that the sources of naturalness and typological tendencies do not generally reside in the nature of the grammar per se, but are often recoverable only from grammar-external sources, such as diachronic factors or psycholinguistic constraints. The goal of this paper is to provide a bridge between the line of linguistic research that emphasizes the synchronic forces operating in language and research that recognizes the forces of diachrony that help shape them. Synchronists are most often interested in broad generalizations concerning the nature of infix placement based on a small set of languages without paying sufficient attention to the actual placement typology of infixes. On the other hand, the diachronists often ignore the synchronic forces that simultaneously drive and constrain linguistic change. In this paper, I attempt to provide a synthesis and evaluation of these strands of work, placing them in a unified perspective.

This paper is organized as follows. In Section 2, I present a ubiquitous feature of the placement typology of infixes, namely, the Edge-Bias Effect. Section 3 provides arguments against a movement-based model of infixation. A theory of infixation relying on Phonological Subcategorization is presented in Section 4. I argue that the Edge-Bias Effect is the result of historical convergence and language transmission.

2. Asymmetric distribution of infixes

Infixes[2] are often characterized as rare compared to the frequency of other affixes. The presence of infixes in any language implies the presence of suffixes and/or prefixes and there are no languages that employ infixation exclusively (Greenberg 1966: 92). Infixes are not at all difficult to find,

however. English-speaking readers will no doubt recognize examples of the expletive infix (e.g., *fan-**fuckin**-tástic* and *Tatam-**fuckin**-gouchee*; McCarthy 1982), the *ma*-infix (e.g., *saxo-**ma**-phone* and *edu-**ma**-cate*; Yu 2004), or even the Hip-hop *iz*-infix (e.g., *h-**iz**-ouse* or *b-**iz**-itch*; Viau, personal communication). Despite their relative rarity, infixes are found in a diverse set of locations within words and morphological formatives. The range of infixation patterns in English already illustrates this point. While the expletive, when used infixally, appears before the stressed syllable, the *ma*-infix prefers to come after a trochaic foot. The *-iz-* infix popularized by Hip-Hop singers is attracted by stress as well. However, it differs from the first two patterns by lodging itself before the stressed vowel.

This apparent richness and diversity, however, mask a striking feature of infixes, namely, the asymmetric typology of their placement properties. It has long been recognized that the placement of infixes converges to two locales, despite its diversity in shape and function. A survey of 154 infixation patterns from more than 100 languages revealed that infixes invariably appear near one of the edges of a stem or next to a stressed unit (Yu 2003).[3] 137 of these infixes (i.e., 89%) are edge-oriented (Table 1). That is, infixes predominately (Fisher Exact test $p < 0.01$) lodge themselves close to one of the edges of the domain of infixation, which may be a root, a stem (i.e., root or root plus some affixes) or a free-standing word (cf. Moravcsik 2000; Ultan 1975). I refer to this asymmetric distribution of infixes as the *Edge-Bias Effect*.

Table 1. Distribution of edge-oriented and prominence-driven infixes

	Fixed Segment	Reduplication	Total
Edge-oriented	94	43	138
Prominence-driven	6	11	17
Total			154

What accounts for this distributional skewing? Over the years many theories have been developed to deal with the placement properties of infixes. Broadly speaking, there are two main traditions. One approach, Phonological Subcategorization, embraces the morpho-phonological mismatching nature of infixes by treating them as affixes that subcategorize for a phonological element, rather than a morphological one (e.g., Inkelas 1990; Kiparsky 1986; McCarthy and Prince 1986; Broselow and McCarthy 1983/1984). Others have argued that infixes are "defective" adfixes (i.e., prefixes and suffixes), and that their underlying prefixing or suffixing nature is obscured by synchronically motivated (morpho-)phonological fac-

tors (e.g., Prince and Smolensky 1993; Moravcsik 1977; McCarthy and Prince 1993a,b; Halle 2001). Let us call this movement-based view of infixation *Phonological Readjustment*.

This paper advocates the superiority of Phonological Subcategorization over Phonological Readjustment. In particular, I argue that Phonological Subcategorization, when embedded within a proper model of the interaction between synchronic and diachronic factors, offers a comprehensive explanation of the placement properties of infixes. Before going into detail my approach to infixation, I first articulate why Phonological Readjustment is not adequate for the task.

3. Against Phonological Readjustment

The Phonological Readjustment approach to infixation is deficient in many respects. To begin with, it is applicable to edge-oriented infixes only; prominence-driven infixes are accounted for in terms of Prosodic Subcategorization, a subtype of Phonological Subcategorization (cf. McCarthy and Prince 1993ab). The main weakness of Phonological Readjustment is more fundamental, however. A central argument for a Phonological Readjustment model of infixation rests on the premise that the infixability of an affix is partly determined by the phonological composition of the affix itself and the context in which it appears (cf. Anderson 1972; Cohn 1992). Formally, this intuition is captured by the constraint ranking schema, P >> M, one of the three basic tenets of Prosodic Morphology within Optimality Theory (McCarthy and Prince 1993b: 110). This constraint schema embodies the idea that prosody-governed morphology is the result of phonological constraints (P) taking precedence over morphological ones (M). Phonological constraints may be of several varieties (e.g., segmental faithfulness, syllable-well-formedness, segmental markedness etc.); morphological constraints include constraints on faithfulness (e.g., FAITH-Root, FAITH-Affix etc.) and linear precedence (i.e., alignment constraints). It is the latter that are of most relevance in the case of infixation. As alluded earlier, for example, the affix *-um-* in Tagalog is treated formally as a prefix but is realized as as infix in order to avoid onsetless syllables in the outputs. If infixation were indeed the result of phonological constraints taking precedence over morphological ones, and phonological constraints are constraints penalizing marked structures, it follows that one should never expect to find instances of infixation that yield structures that are prosodically less well-formed than their prefixing or suffixing counterparts. Yet,

infixes that create prosodically undesirable structures indeed exist. For example, Blevins (1999) reports that in Leti (Austronesian, Central Malayo-Polynesian), nominalizing affixation has eight distinct phonological forms: three infixes *-ni-*, *-n-*, *-i-*; the three prefixes *ni-*, *i-*, *nia*; the parafix *i-+-i-* (i.e., simultaneous prefixation and infixation); and a zero allomorph. Each of these allomorphs has very specific distribution. For example, the infix *-ni-* appears before the first vowel of the stem when the stem has an initial non-nasal or non-alveolar consonant followed by a non-high vowel (e.g., *kaati* → *k-**ni**-aati* 'carving'; *pèpna* → *p-**ni**-èpna* 'act of fencing, fence'). When the stem's first syllable contains a high vowel, *-ni-* realizes as *-n-* after the initial consonant (e.g., *kili* → *k-**n**-ili* 'act of looking'; *tutu* → *t-**n**-utu* 'act of supporting, support'). Another allomorph of *-ni-* is *-i-*, which surfaces before the first vowel of the stem when the initial consonant is a sonorant or an alveolar consonant (e.g., *dèdma* → *d-**i**-èdma* 'act of somoking'; *mai* → *m-**i**-ai* 'arrival').

The fact that the nominalizing morph, *-ni-*, is infixed is puzzling within a prosody-optimizating view of infixation. It is unclear what problems confront the strategy of simply prefixing *-ni-* to the stem (e.g., ***ni**-teti* instead of *t-**ni**-eti* 'chop, chopping'). The infixal output contains initial onset clusters and vowel-vowel sequences, both are prosodically undesirable features typologically-speaking. To be sure, infixation in Leti is not motivated by edge-avoidance. That is, it will not suffice to assert that the coincidence of the left edges of the root and the output prosodic word trumps the prefixing requirement of the nominalizing affix since the nominalizer prefixes to vowel-initial stems directly (e.g., *n-osri* → ***i**-osri*, ***ni**-osri* 'act of hunting'; *n-atu* → ***i**-atu*, ***ni**-atu* 'knowledge').[4]

What the Leti case illustrates is the fact that infixation can occur for no obvious prosodic or phonotactic gains. Prosodic optimization offers us no insight as to why such infixation patterns exist at all. One may appeal to edge-avoidance to account for certain cases, but such an analysis would have lost the appeal of the Phonological Readjustment approach, that is, the functional motivation for an affix to migrate to minimize output markedness. The list of non-functionally motivated infixes may be expanded to include the myriad cases of infixes that neither improve nor worsen the markedness of the output. For example, in Hua (Trans-New Guinea, Eastern Highlands), the negative marker *-ʔa-* appears before the final syllable (e.g., *zgavo* → *zga**ʔa**vo* 'not embrace'; *harupo* → *haru**ʔa**po* 'not slip'; Haiman 1980). The prefixal or suffixal counterpart of such a CV marker would have resulted in prosodically equally well-formed outputs. No obvious

functional motivations can be adduced for the infixing of such a morpheme.

The purported functional bond between the shape of an infix and its position with respect to the host is further weakened upon a closer examination at the typology of infix shape and its placement property. Of the forty cases of fixed segment VC infixation surveyed, twenty-three are from Austronesian languages, eleven from Austro-Asiatic languages, while only six are from other languages. Of the thirty-four VC infixes that come after the first consonant or before the first vowel of the stem, all but one comes from the Austronesian and the Austro-Asiatic families. The fact that the majority of the post-onset VC infixes belong to one of two language families suggests that such cases might be features inherited from their respective proto-languages. In contrast, about 20% of the fixed-segment infixes surveyed are CV in shape, about 10% are just a single vowel, and about 44% are monoconsonantal. Of these coda- or cluster-generating monoconsonantal infixes, only five are from Austronesian and three from Austro-Asiatic. Thus, a closer look at the cross-linguistic evidence offers no concrete evidence for an ethological understanding of infixation at the synchronic level; the position of an infix is not a function of its immediate environment. The purported functional connection may simply reflect a bias introduced by impoverished sampling in previous studies. Since the constraint-based approach to Phonological Readjustment was built upon this ethological assumption of infix placement, the refutation of this premise calls for an alternative understanding of the phenomenon. How then should the asymmetric distribution of infixes be understood? The remainder of this paper is devoted to addressing this point.

4. A comprehensive model of infix distribution

4.1. Introduction

A proper understanding of the placement typology of infixation necessitates an appreciation of the nature of interaction between the diachronic and synchronic forces operating on language. Here, I follow Greenberg (1969) and assume that typological patterns emerge from common diachronic changes in related and unrelated languages. From the point of view of current theories of linguistics, the starting point for discussions of language change is acquisition, that is, the individual's acquisition of a grammar distinct from the one which underlies the output of the preceding gen-

eration. The key to understanding the "error" in grammar transmission lies in the nature of the input for acquisition. The input data is often wrought with ambiguities. The learner's task is to find a good match between the input and the output of candidate grammars. A model of infix distribution must therefore take into account this dynamic interplay between diachronic and synchronic forces. Such a model must have three main components.

(1) A comprehensive model of infix distribution
   a. Grammar-internal constraints:
      A theory of phonological subcategorization
   b. Grammar-external constraints:
      Constraints on morphological learning
      Constraints on morphological change
   c. A theory of interaction between these grammar-internal and grammar-external constraints

First, there must be a formal theory of phonological subcategorization and, by extension, morphological subcategorization that can express the full range of subcategorization relations in language. Allowing affixes to target phonological constituents per se is not sufficient in explaining the restricted typology of infix placement, however. The model must also include a theory of how phonological subcategorization interacts with grammar-external constraints imposed on morphological learning and morphological change. In particular, the theory of affix placement, indeed of grammar as a whole, must be embedded within a temporal axis. As such, the diachronic evolution of infixes is as much an integral part of the explanation as is their treatment within the synchronic grammar. In what follows, I briefly elaborate the nature of each of these components.

4.2. Infixation as edge misalignment

The synchronic theory of infix placement adopted in this work is that of Phonological Subcategorization, which inherits the insight of earlier subcategorization-based theories, such as prosodic subcategorization (McCarthy and Prince 1986) and the bi-dependent approach to infixation (Kiparsky 1986; Inkelas 1990), that infixation involves the alignment of a morphological entity with respect to a phonological one. However, it breaks with *Prosodic* Subcategorization by eliminating the restriction upon which only genuine prosodic categories are allowed to take part in morpho-

phonological alignment relationship (see also Kiparsky 1986; Inkelas 1990). Subcategorization requirements are stated in the formalism of Generalized Alignment (GA, McCarthy and Prince 1993a: 80). Unlike the traditional formulation of GA, the set of PCat includes units on the CV skeletal tier as well as categories within the Prosodic Hierarchy including the mora.

(2) Align $(Cat_1, Edge_1, Cat_2, Edge_2) =_{def}$
$\forall\ Cat_1\ \exists\ Cat_2$ such that $Edge_1$ of Cat_1 and $Edge_2$ of Cat_2 coincide.
Where $Cat_1, Cat_2 \in$ **PCat** $\cup$ GCat
$Edge_1, Edge_2 \in$ {Right, Left}

A notion central to the present theory of infix placement is the notion of the *pivot*, which refers to the morphological and/or phonological unit to which an infix attaches.[5] So far, I have identified the following set of phonological constituents that may serve as phonological pivots of infixation:

Table 2. Potential pivots of infixation

Edge pivots	Prominence pivots
Leftmost consonant, vowel, or syllable	Stressed vowel, syllable, or foot
Rightmost vowel or syllable	

Phonological Subcategorization obtains when a designated edge of a morphological constituent (Cat_1) coincides with a designated edge of a phonological pivot (Cat_2). For example, in Ulwa (Misumalpan), the construct state (CNS) markers are affixed to the right edge of an iambic foot (e.g., *súːlu* → *súː-**ma**-lu* 'dog-CNS2'; *waráw̥wa* → *waráw̥-**kana**-wa* 'parrot sp.-CNS33'; Green 1999: 64). On the present theory, the construct state marker is analysed as suffixing to an iambic foot. The iambic foot is thus the pivot of the construct state marker.

(3) Ulwa infixal construct noun marker
ALIGN ($[POSS]_{Af}$, L, FT', R) (McCarthy and Prince 1993a)
'The left edge of the construct noun marker is aligned to the right edge of the head foot.'

The subcategorization frame of an infix is thus formally no different from regular prefixes and suffixes. Infixation obtains, however, when two conditions are satisfied: (i) when the domain of affixation, be it the root, the stem or the word, is larger than the size of the phonological constituent;

i.e., the pivot, subcategorized by the affix and (ii) when the language tolerates morpheme interruptions.[6]

Now, having asserted that the distribution of infixes is governed by a restricted set of phonological pivots that enter into phonological subcategorization relations with morphological units, one might ask to what extent it is possible to delineate the set of attested phonological pivots without resorting to stipulation. This is the topic of the next section.

4.3. The Pivot Theory

The main proposal advanced in this section is the idea that the morphological learning algorithm is biased toward phonological subcategorization relations that are built upon pivots that are perceptually and psycholinguistically salient, where salience may include factors such as ease of recoverability and facilitation in language processing and lexical retrieval. I shall refer to this the Salient Pivot Hypothesis:

(4) Salient Pivot Hypothesis
Phonological pivots must be salient at the psycholinguistic and/or phonetic level.

The idea that certain positions in a word are privileged in the grammar has a long pedigree. As early as Trubetzkoy (1939: 22), it has been recognized that phonological contrasts are sustained to variable degrees depending on the positions of the word. Most relevant to the present discussion is the fact that certain positions in a word are "strong" in that they are either the sole locus licensing a contrast, or that they are more resistant to reduction. For example, Smith (2004) argues that positional augmentation constraints are relativized only to phonologically prominent or "strong" positions, which include the stressed syllable, the released consonants (often the onset of a syllable), the long vowel, the initial syllable, and the morphological root. The final syllable is also the domain of some prominence. Phonologically, certain contrasts are found to be preferentially licensed in final syllables (e.g., tone and vocalic contrasts, Zhang 2001). In acquisition, children are most likely to retain internal-stressed syllables and first and final syllables (Kehoe and Stoel-Gammon 1997). Past research has also shown that the edges of words are psycholinguistically prominent. For example, Shattuck-Hufnagel (1992) argues that the first consonant of a word is prominent based on lexical retrieval evidence. As summarized in Table 3, the set of

phonological pivots is a proper subset of the phonologically and psycholinguistically prominent positions.

Table 3. Prominent phonological positions vs. infixal pivots

Psycholinguistic salient/ phonological prominent positions	Infixal pivots
Initial syllable	First consonant, vowel, or syllable
Final syllable	Final consonant, vowel, or syllable
Stressed syllable	Stressed vowel, syllable, or foot

This correlation is significant. The fact that the set of phonological pivots converges with the set of phonologically and psycholinguistically prominent positions suggests that the Salient Pivot Hypothesis is on the right track. Assuming that a learner is equipped with knowledge of the GA schema, her task is to fill the variable slots with arguments of the correct type based on the available data. The representation of morphological processes, which involves generalizations over the distinction between stems and affixes, emerges as the result of appropriate associations between formatives (Bybee 1995, 2001; Albright 2002; Albright and Hayes 2003).

The Pivot Theory alone does not guarantee the Edge-Bias Effect, however. While the set of phonological pivots may be reduced to two subsets, edge pivots and prominent pivots, there is no inherent bias toward the edge pivots over the prominent pivots. The ultimate source of the Edge-Bias Effect comes from the origins of infixes. In the next section, I show that edge-oriented infixes ultimately originate from adpositional affixes (i.e., prefixes or suffixes). Their peripheral origins give rise to their synchronic edge-oriented profile. Ultimately, it is the preponderance of such infixes with adpositional origin that gives rise to the observed Edge-Bias Effect.

4.4. The origins of infixation

Infixes emerge out of ambiguities in morphological parsing. Infixes are predominantly edge-oriented because the set of ambiguity-induced changes that leads to the development of infixation and the mechanism of subcategorization formation during language transmission converge toward outcomes that favor edge-oriented infixes. As foreshadowed above, infixes predominately have their origins in historical prefixes and suffixes. Building on the insights of Ultan's (1975) pioneering work on the diachronic typology of infixation, the present typology expands and, along the way,

revises the understanding of the diachronic landscape of the origins of infixes. Four sources of infixes are found: morphological entrapment in 4.4.1, phonetic metathesis in 4.4.2, reduplication mutation in 4.4.3, and analogical excrescence in 4.4.4.

4.4.1. Entrapment

Entrapment takes place when a morpheme is stranded within a fossilized composite of an outer morpheme and the stem. That is, in a composite *zyX* where *z* and *y* were historical adpositional affixes, when *z* merges with the root *X* to form a new root *ZX* such that the relative independent existence of *z* or *X* is no longer recoverable synchronically, *y* is said to be entrapped in a form like *ZyX* (similar logic applies to entrapped suffixes). Entrapment is the most often invoked mechanism of infixation. A prime example comes from the languages of the Muskogean family. (The following discussion draws heavily on work by Haas 1977 and Martin and Munro 2005.)

Many morphemes, most notably the agreement markers, in the Muskogean languages are infixes. However, the locations of these infixes are remarkably consistent. Haas (1977) was first to argue that the similarity between the placements of the disparate array of morphological entities can be explained as the result of the merger of a verb plus auxiliary verb complex in the history of the languages. Historical prefixes on the auxiliary verb are, therefore, "trapped" between the main verb and the historically separate auxiliary (i.e., VerbStem Affix-Auxiliary). For example, the Proto-Muskogean (PM) plural affix, **oho-*, developed into a pre-final syllable infix, *-ho-*, in Creek-Seminole and Hitchiti-Mikasuki (e.g., Mikasuki: *hica* 'see' / *ci-hi:**ho:**ca-la:ka* 'he will see you all'; *impa-* 'eat' / *im**ho**pa-* 'eat (PL)'). This and other inflectional infixes target the final syllable because the erstwhile auxiliary verbs, to which historically the inflectional affixes prefixed, were monosyllabic in PM. Similarly, in PM, the mediopassive proclitic **il-* appears after the applicative **a-* (PM: **a-il-pica* 'be looked at') and the plural **oho-* (PM: **oho-il-icca* 'be shot'). In the Southern Muskogean languages, however, it appears as an infix (e.g., Alabama: *o:ti* 'make a fire' → *o:**li**ti* 'kindling'; *takco* 'rope (v.)' → *ta**li**kco* 'be roped'). Martin and Munro (2005) attribute the synchronic distribution of this mediopassive infix to the result of the reanalysis of the prefixes **a-* and **oho* as part of certain neutral verbs, thus trapping the intervening

affix **il*. Subsequent analogical extension gives rise to a post-initial vowel distribution of the mediopassive today.

The origins of Muskogean infixes not only exemplify the mechanism of entrapment, but also illustrate an important aspect of the genesis of infixes in general. While the historical *plural prefix* turned into a *pre-final syllable infix* due to the monosyllabicity of the grammaticalized auxiliary verbs, the historical mediopassive *proclitic* gave rise to a *post-initial vowel infix*. What this shows is that the edge alignment between the infix and the pivot does not always mimic the historical source. The ultimate determinant of what the pivot is rests on the constancy of the potential pivot unit. The fact that the mediopassive infix takes the initial vowel as the pivot rather than the material following it (i.e., the historical root) has to do with the size inconsistency of the historical roots, which may be monosyllabic or disyllabic. Since the set of historical roots do not form a coherent prosodic or phonological unit, it was not adopted as the pivot of mediopassive affixation today. On the other hand, the material preceding the mediopassive can be coherently characterisized as the first vowel since the fossilized prefixes were historically **a-* and **ho* (< **oho*).

4.4.2. Metathesis

Metathesis refers to the transposition between two segments, which can be schematised as AB > BA. Blevins and Garrett (1998, 2005) propose that metatheses are the results of sound changes motivated by listener misperception and there are four main types: perceptual, compensatory, coarticulatory, and auditory metatheses. Many infixes are the results of such phonetic metatheses. For example, Benedict (1943) describes that, in Lepcha (Sino-Tibetan, Lepcha), the alternation between intransitive and transitive verbs is marked by the infixing of *-j-* after the initial consonant (e.g., *pok* 'cast down' → *pjok* 'cause to cast down'; *nom* 'smell [intr.]' → *ɲjom* 'smell [tr.]'). He argues that the infix originates from the Tibeto-Burman (TB) causative prefix **s-* (e.g., Lepcha *nom* 'smell (intr.)' corresponds to Tibetan *mnam-pa* but Lepcha *ɲjom* 'smell (tr.)' corresponds to Tibetan *snam-pa*). The palatal glide was originally conditioned by the causative prefix *s-*. After the loss of **s* in initial consonant clusters, what used to be coarticulatory palatalization was then interpreted as morphological. This metathesis was not restricted to the intransitive/transitive alternation. Other words with *s*-initial consonant clusters also exhibit the epenthesis of the palatal (e.g., TB **s-no* 'nose' > Lepcha *ɲjo* 'snot'; TB **s-nam* 'daughter-

in-law' > Lepcha *njom* 'daughter-in-law'). An important corollary of the phonetic origin of metathesis is that it restricts the set of metathesis-induced infixes to the set of 'stretch-out' features and segments that are amenable to perceptual confusion (e.g., labial, palatal, pharyngeals, laryngeals, liquid, and rhotic). Moreover, when an adfix metathesizes into an infix, the resultant infix is likely to remain close to one edge of the stem since most cases of phonetic metathesis are local. That is, the transposed segment remains a segment away from its original etymological position. Even if metathesis were long distance, the transposing segment would migrate into relatively prominent positions (i.e., initial or stressed), never into less prominent ones (Blevins and Garrett 2005).

4.4.3. Reduplication mutation

Certain infixation patterns, fixed-segmented or otherwise, are descended from historical reduplication constructions. They are the results of *reduplication mutation*. An example comes from Chuukese (Austronesian, Eastern Malayo-Polynesian; the following discussion is based on Garrett 2001). In Chuukese, pluractional is marked by CVC reduplication on consonant initial-verbs (e.g., *fætæn* 'walk' → ***fæf***-*fætæn* 'be in the habit of walking'; *mɔ:t* 'sit' → ***mɔm***-*mɔ:t* 'be sitting'). However, when the verb begins with a vowel or *w* (the only word-initial glide), the prefix/infix -*Vkk*-, where "V" is a copy of the following vowel, is used instead (e.g., *isɔni* 'keep it' → ***ikk***-*isɔni* 'be keeping it'; *wɨn* 'drink' → *w*-***ikk***-*ɨn* 'be in the habit of drinking'). This infix is the result of the loss of word-initial **k* in durative verbs with original initial **k* (e.g., Pre-Trukic **kakaká:su* > Chuukese *əkkə:s* 'treat as a sibling-in-law of the same sex'). The reason for the **kVk-k-* > **Vkk-* reanalysis can be most effectively illustrated with the word *ɔsɔm*^{w}*o:nu* 'pay chiefly respect to'. Historically, it was **kasam*^{w}*ó:nu*, its reduplicated form would presumably be **k****ak-k****asam*^{w}*ó:nu*. After the dropping of the initial **k*, the reduplicated form became *****ak-k****asam*^{w}*ó:nu*, which was then reanalysed as *****akk***-*asam*^{w}*ó:nu* since **kasam*^{w}*ó:nu* would have become **asam*^{w}*ó:nu*. This apparent -*Vkk*- infix was then generalized to other vowel-initial verbs. A subsequent prevocalic *w*-insertion process affected certain vowel-initial words (e.g., **kóta* > *wo:t* 'coconut husking stick'; **ínu* > ***wɨn*** 'drink'). *W*-insertion created synchronic *base* ~ *durative* alternations of the pattern *wV*- ~ *wVkkV*-. For example, the reconstructed reduplicated form of the word *wo:t* 'coconut husking stick' would have been **k****ok-k****ota*. After initial-*k* dropping, it became *****ok-k****otta*. The *w*-

insertion process took place, yielding **wokkotta*. Presumably, based on fact that the affix *-Vkk-* was posited independently of forms like this, **wokkotta* would be analysed as **w-okk-otta*.

4.4.4. Analogical excrescence

Thus far, I have focused on infixes that have historical antecedents. However, this is not always the case. Haspelmath (1995) refers to such instances of morphological creation as morphological excrescence; that is, when an affix emerges in a language without an immediately historical antecedent. A prime example of excrescence is the case of *ma*-infixation found in some varieties of English (e.g., *saxo-**ma**-phone*, *edu-**ma**-cate*, *Ala-**ma**-bama*, *onomato-**ma**-poeia*).[7] This infix is unique for several reasons. First this is a relatively new construction recently introduced into Vernacular American English. It was popularized by the TV animation series, *The Simpsons*®, particularly the speech of the main character, Homer Simpson. This infix is also interesting since it shares no resemblance to any known historical prefix or suffix in the English language. As *ma*-infixation appears to be a colloquialism, it is difficult, if not impossible, to trace the earliest attestation of this construction in the history of English. However, the origin of this affix is not completely lost. The proposal here is that *-ma-* emerges out of the accidental convergence among two different filler-word constructions in English. That is, when one has a hard time recalling a precise word, name, or phrase, a set of vague, nonsense in English, filler words are often used to fill the gap. I have argued elsewhere that *ma*-infixation emerges out of the accidental resemblance between two particular sets of filler words: the variants of thing and the phrase words based on a question (Yu 2003).

(5) a. Variant of things:
*thinga**ma**bob, thing**ma**bob, thinga**ma**jig, ringa**ma**jiggen, ringa**ma**jizzer*
b. Phrase words based on a question:
*Whatdya**me**calli, whatcha**ma**callit*

As illustrated above, these two sets of filler words/phrases all contain the medial sequence *-ma-*. The source of this sequence is not recoverable from the forms themselves. The listener, upon encountering these sets of words together, drew the conclusion that they are all related by an infix *-ma-* sin-

ce these words are all nouns and they share similar pragmatic meaning of casualness and imprecision. The *-ma-* infix was then extended to other domains to indicate the speaker's casual and noncommittal attitude. It is a small step to extend this usage of *-ma-* to indicate sarcasm.

What might have further facilitated the creation of the *-ma-* infix, besides that these words have similar meanings, is the fact that they also share similar prosodic profiles. In both *whatchamacallit* and *thingumabob*, for example, the sequence, *ma*, is sandwiched between wo metrical feet; i.e., ('*whatcha*)*ma*(ˌ*callit*) and ('*thingu*)*ma*(ˌ*bob*), which might have been perceived as non-accidental, hence the extraction of a *-ma-* morpheme. What is crucial here is the fact that the reanalysis is prompted by the inability to recover the placement of *-ma-* through segmental means. In lieu of that, units at the prosodic level were instead identified as the pivot of affixation (i.e., a disyllabic trochaic pivot).

5. Conclusion

Infixation has been heralded as the poster child of the aggressive interaction between phonology and morphology, as conceptualized in OT-Prosodic Morphology. The typological evidence does not support this view, however. The synchronic typology of infixation reveals no deep-seeded connection between the shape of an infix and its surface distribution. The present study contends that the Edge-Bias Effect is the result of two converging forces: an inductive bias in morphological learning that favors salient edge and prominent pivots in subcategorization formation and the preponderance of diachronic pathways that create infixes from adpositional affixes. These two forces are said to be converging because the force of the inductive bias is most apparent when the learner is confronted with a situation where a straightforward adpositional morphological subcategorization is not possible (i.e., at the stage of morphological reanalysis).

This understanding of the placement typology of infixes necessitates a more constrained view of the Phonology-Morphology Interface. Synchronically, morphological objects may target phonological entities in subcategorization. Phonological factors may adjudicate the selection of allomorphs but may never influence the satisfaction of their respective subcategorization restrictions directly. The interaction between phonology and morphology is also indirect at the diachronic level. Changes in morphological subcategorization may be motivated by changes in the phonological system.

However, sound change and phonological change do not target morphological processes directly (thus following the exceptionless dictum of the Neogrammarian view of sound change). As the study of the origins of infixes shows, infixes are the results of misanalysis that resulted from ambiguity-inducing changes which originate elsewhere in the system; affixes do not literally move against its underlying nature in response to phonological pressures. It is the ambiguity in the input at the stage of morphological learning that prompts some learners to posit infix-generating subcategorization frames for affixes that were previously adpositional. The asymmetric distribution of infixes is thus the result of a complex interaction between linguistic change and language acquisition, not the results of constraint interaction within the synchronic grammar. The interaction between phonology and morphology is therefore much more limited in scope than is conceived by advocates of OT-Prosodic Morphology. Affix placement; i.e., the linear position of morphemes with respect to other morphological entities, must remain outside the scope of the direct influence of phonological pressures (see Paster [2006] for similar conclusions).

This exercise also brings the discussion of the relations between the studies of the synchronic and diachronic aspects of language into sharper focus. A recurring theme in theoretical discussions of phonology, and elsewhere, centers on the issue of how the formalism proposed is explanatorily adequate (Chomsky 1986). That is, besides arriving at a formalism that describes what happens, many linguists consider it imperative to also restrict the formalism to capture why a phenomenon unfolds only the way it does. In this work, I have argued that the actual locus of explanation resides in the domain of the diachrony and language acquisition (cf. Anderson 1988). Similar views have been made for phonological typology as well, most notably in Juliette Blevins' recent work on Evolutionary Phonology (2004). These authors contend that, while the formal system should model productive grammatical effects, Universal-Grammar-specific explanations should be appealed to only when a phenomenon cannot be accounted for by psychological or historical means.

Notes

1. Many thanks to Mary Paster, the audience at the Max Planck Institute of Evolutionary Anthropology at Leipzig, the two anonymous reviewers, and the editors for their discussion and criticism. Any errors are of course my own.

2. I consider an affix infixing if it appears as a segmentally distinct entity between two strings that form a meaningful unit when combined but do not themselves exist as meaningful parts.
3. The database consists of infixation patterns from 112 languages of 26 different phyla and isolates. The guiding principle in compiling the present database is a "the-more-the-merrier" strategy. Languages without infixes were not surveyed, as the main goal of this research is to consider the diversity of infix placement within the set of infixing languages, rather than their geographical distribution.
4. According to van Engelenhoven (2004), the *i*-prefix sometimes nominalizes the verb as an instrument while the *ni-* prefix nominalizes the verbal act.
5. Kiparsky (1986) uses the term "pivot" to refer to the portion of a stem over which an infix "skips", thus analogous to the operation of negative circumscription (McCarthy and Prince 1990). The notion of pivot adopted here is akin to that of positive circumscription where a pivot describes the circumscribed constituent to which an affix attaches.
6. Languages that do not tolerate the creation of derived discontinuous morphs may respond to failure of satisfying a phonological subcategorization requirement in different ways. Carstairs-McCarthy (1998) identifies three strategies: (a) unsystematic filling of the gaps; (b) systematic morphological filling of the gaps; and (c) systematic syntactic filling of the gaps via periphrasis.
7. For more details on the placement properties of this infix, see Yu (2004).

References

Albright, Adam C.
2002 The identification of bases in morphological paradigms. Ph.D. diss., Department of Linguistics, University of California, Los Angeles.

Albright, Adam C., and Bruce Hayes
2003 Rules vs. analogy in English past tenses: A computational/-experimental study. *Cognition* 90: 119–161.

Anderson, Stephen
1972 On nasalization in Sundanese. *Linguistic Inquiry* 3: 253–268.
1988 Morphological change. In *Linguistics: The Cambridge Survey*, Frederick J. Newmeyer (ed.). Cambridge, UK: 324–362. Cambridge University Press.

Benedict, Paul K.
1943 Secondary infixation in Lepcha. *Studies in Linguistics* 1 (19): 1–2.

Blevins, Juliette
1999 Untangling Leti infixation. *Oceanic Linguistics* 38 (2): 383–403.
2004 *Evolutionary Phonology: The Emergence of Sound Patterns*, 117–156. Cambridge, UK: Cambridge University Press.

Blevins, Juliette, and Andrew Garrett
1998 The origins of consonant-vowel metathesis. *Language* 74 (3): 508–556.
2005 The evolution of metathesis. In *The Phonetic Basis of Phonology*, Bruce Hayes, Robert Kirchner, and Donca Steriade (eds.). Cambridge: Cambridge University Press.
Broselow, Ellen, and John McCarthy
1983/1984. A theory of internal reduplication. *Linguistic Review* 3: 25–88.
Burzio, Luigi
2005 Sources of Paradigm Uniformity. In *Paradigms in Phonological Theory*, Laura J. Downing, Tracy A. Hall, and Renate Raffelsiefen (eds.), Oxford: Oxford University Press.
Bybee, Joan
1995 Regular morphology and the lexicon. *Language and Cognitive Processes* 10 (5): 425–455.
2001 *Phonology and Language Use*. Cambridge, UK: Cambridge University Press.
Carstairs-McCarthy, Andrew
1998 Phonological constraints on morphological rules. In *The Handbook of Morphology*, Andrew Spencer, and Arnold Zwicky (eds.). Oxford, UK: Blackwell Publishers.
Chomsky, Noam
1986 *Knowledge of Language*. New York: Prager.
Cohn, Abigail C.
1992 The consequences of dissimilation in Sundanese. *Phonology* 9 (2): 199–220.
van Engelenhoven, Aone Thomas Pieter Gerrit
2004 *Leti: a Language of Southwest Maluku*. Leiden: KITLV Press.
Flemming, Edward S.
1995 Auditory representations in phonology. Ph.D. diss., Department of Linguistics, University of California, Los Angeles.
Garrett, Andrew
2001 Reduplication and infixation in Yurok: Morphology, semantics, and diachrony. *International Journal of American Linguistics* 67 (3): 264–312.
Green, Thomas M.
1999 A Lexicographic Study of Ulwa. Ph.D. diss., Department of Linguistics, MIT.
Greenberg, Joseph H.
1966 Some universals of grammar with particular reference to the order of meaningful elements. In *Universals of Language*, Joseph H. Greenberg (ed.). Cambridge, Mass.: MIT Press.

1969 Some methods of dynamic comparison in linguistics. In *Substance and Structure of Language*, Jaan Puhvel (ed.). Berkeley: University of California Press.

Haas, Mary R.

1977 From auxiliary verb to inflectional suffix. In *Mechanisms of Syntactic Change*, Charles Li (ed.). Austin: University of Texas Press. 525–537.

Haiman, John

1980 *Hua: A Papuan Language of the Eastern Highlands of New Guinea*. Amsterdam: John Benjamins.

Halle, Morris

2001 Infixation versus onset metathesis in Tagalog, Chamorro, and Toba Batak. In *Ken Hale: A Life in Language*, Michael J. Kenstowicz (ed.), 153–168. Cambridge, MA: The MIT Press.

Haspelmath, Martin

1995 The growth of affixes in morphological reanalysis. In *Yearbook of Morphology* 1994, Geert Booij, and Jaap van Marle (eds.), 1–29. Dordrecht: Kluwer.

Hermans, Ben, and Marc van Oostendorp (eds.)

1999 *The Derivational Residue in Phonological Optimality Theory*. Amsterdam: John Benjamins.

Inkelas, Sharon

1990 *Prosodic Constituency in the Lexicon*. New York: Garland Publishing.

Kehoe, Margaret, and Carol Stoel-Gammon

1997 The acquisition of prosodic structure: An investigation of current accounts of chidlren's prosodic development. *Language* 73 (1): 113–144.

Kiparsky, Paul

1986 The phonology of reduplication. Ms. Stanford University.

Martin, Jack B., and Pamela Munro

2005 Proto-Muskogean morphology. In *Native Languages of the Southeastern United States*, Heather K. Hardy, and Janine Scancarelli (eds.), 299–320. Lincoln: University of Nebraska Press.

McCarthy, John

1982 Prosodic Structure and Expletive Infixation. *Language* 58: 574–590.

1999 Sympathy and phonological opacity in Optimality Theory. *Phonology* 16: 331–399.

McCarthy, John, and Alan Prince

1986 Prosodic Morphology. Ms. University of Massachusetts and Brandeis University.

1990 Foot and word in Prosodic Morphology: the Arabic broken plural. *Natural Language and Linguistics Theory* 8: 209–283.

1993a Generalized alignment. In *Yearbook of Morphology 1993*, Geert Booij, and Jaap van Marle (eds.), 79–153. Dordrecht: Kluwer Academics.

1993b Prosodic Morphology I: Constraint interaction and satisfaction. Ms. University of Massachusetts, Amherst, and Rutgers University.

Moravcsik, Edith

1977 *On Rules of Infixing*. Bloomington: Indiana University Linguistics Club.

2000 Infixation. In *Morphology: An International Handbook on Inflection and Word-Formation.* Volume 1, Geert Booij, Christian Lehmann, and Joachim Mugdan (eds.), 545–552. Berlin/New York: Mouton de Gruyter.

Orgun, Cemil Orhan, and Ronald L. Sprouse

1999 From MParse to Control: Deriving ungrammaticality. *Phonology* 16: 191–224.

Paster, Mary

2006 Phonological conditions on affixation. Ph.D. diss., Department of Linguistics, University of California, Berkeley.

Prince, Alan, and Paul Smolensky

1993 Optimality Theory: Constraint interaction in generative grammar. Ms. New Brunswick: Rutgers University, Cognitive Science Center.

Shattuck-Hufnagel, Stephanie

1992 The role of word structure in segmental serial ordering. *Cognition* 42: 213–259.

Smith, Jennifer L.

2004 Making constraints positional: Toward a compositional model of CON. *Lingua* 114: 1433–1464.

Trubetzkoy, Nikolaj S.

1939 *Grundzüge der Phonologie*. Prague: Travaux du Cercle linguistique de Prague.

Ultan, Russell

1975 Infixes and their origins. In *Linguistic Workshop III*, Hansjakob Seiler (ed.), 157–205. (Structura 9). München: Fink.

Yu, Alan C. L.

2003 The morphology and phonology of infixation. Ph.D. diss., Department of Linguistics, University of California, Berkeley.

2004 Reduplication in English Homeric infixation. In *Proceedings of the 34th North East Linguistics Society*, Kier Moulton and Matthew Wolf (eds.), 619–633. Amherst: GLSA.

Zhang, Jie

2001 The effects of duration and sonority on contour tone distribution-typological survey and formal analysis. Ph.D. diss., Department of Linguistics, University of California, Los Angeles.

Typological evidence for the separation between stress and foot structure

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1. Introduction

It is a common property in many languages that at least one syllable of every word has *stress*, i.e., is produced with greater energy than the surrounding syllables and thus, may be longer, louder, and/or have higher pitch (Ladefoged 2006: 243–244; see also Hayes 1995: 5–8). Consider for example the words *happy* and *Apalachicola*. In *happy* a stressed syllable precedes an unstressed syllable; in *Apalachicola*, the first, third, and fifth syllables are stressed (with the fifth syllable carrying the main or primary stress, and the first and third syllables carrying secondary stress), while the second, fourth and sixth syllables are unstressed. The alternation of stressed and unstressed syllables in a word, which is common in many languages, is an instantiation of the rhythmic property of stress, which tends to apply cross-linguistically (Hayes 1995: 29–30).[1]

A general assumption in metrical phonology is that stress is a rhythmic phenomenon encoded by strong–weak relations between syllables (Liberman 1975; Liberman and Prince 1977). Syllables are grouped into higher prosodic units named *metrical feet*, or feet for short. These are usually disyllabic and have minimally a head (or "strong" syllable), and generally also a complement (or "weak" syllable); the head usually has phonetic stress and longer duration than the complement. As shown in (1a), the syllables in *happy* form a disyllabic foot, with the first syllable as head and the second as complement. In *Apalachicola* three disyllabic feet are formed; in all of them, the head precedes the complement (1b). The most common feet are trochaic (the head precedes the complement) and iambic (the complement precedes the head) (Hayes 1995).

(1) Footing

a.	*happy*	('ha.ppy)
b.	*Apalachicola*	(ˌA.pa.) (ˌla.chi.) ('co.la)

The metrical foot is relevant in phonological theory, not only for stress assignment, but also for word minima and prosodic morphology, among other phenomena (see for example Hayes 1995). The common view is that stress is the physical manifestation of foot structure, and that both are co-dependent. In this sense, foot structure comes first. This view is assumed, among others, by Hayes (1981, 1995), Hammond (1984), McCarthy and Prince (1996) and Kager (1989); this will be referred to as the standard metrical theory in this paper.

But there are other ways in which the relationship between stress and footing are conceived. For Prince (1983) and Selkirk (1984) the foot as a constituent is redundant and stress can account for most of the cases where feet are invoked. In their influential *Essay on Stress*, Halle and Vergnaud (1987) argue that, while metrical feet are needed to account for stress phenomena, they are not always interpreted in stress terms. Other authors that arrive at similar conclusions include Crowhurst (1996), who proposes that Cairene Egyptian Arabic (Afro-Asiatic, Semitic) uses headless, stressless feet to locate main stress, and Walker (1997), who concludes that in languages with unbounded (quantity-sensitive) stress patterns, stress is assigned independently of foot structure (see also Crowhurst 1991; Hewitt 1992; and Idsardi 1992).

This chapter contributes to the discussion of the relationship between stress and foot structure by focusing on segmental phenomena that are totally or partially motivated by metrical considerations. It is well known that stress and foot structure may affect vowel realization in many languages; typically, vowels are reduced, deleted or neutralized in unstressed syllables and lengthened, epenthesized or preserved in stressed syllables (see for example Delattre 1969; Goldsmith 1990; Crosswhite 1999; Hayes 1995; and Smith 2002). Vowel assimilation, metathesis and dissimilation can also be sensitive to footing (Flemming 1994; Blevins and Garrett 1998; Suzuki 1998, among others). Because of the articulatory and acoustic characteristics of vowels, it is generally thought that stress and foot structure may influence their pronunciation to a greater extent than that of consonants. However, many cases of metrically-sensitive consonantal phenomena also occur in the languages of the world, as explored, among others, by Lavoie (2001) for lenition, Blevins and Garrett (1998) for metathesis, and Steriade (1999) for glottalization.

González (2003) reports a cross-linguistic survey of metrically-conditioned consonantal phenomena which includes 74 languages from 24 language families (Table 1). Instances of many different types of

alternations are examined, including deletion, epenthesis, metathesis, flapping, lenition, fortition, secondary articulation and dissimilation, to mention a few. This survey excludes contrast-based phenomena; these are examined in Beckman (1997, 1998).

Table 1. Language families represented in González (2003)

Afro-Asiatic	Hokan	Iroquoian	Sino-Tibetan
Algic	Indo-European	Mura	Siouan
Altaic	Celtic	Nakh-Dagestanian	Tarascan
Arauan	Germanic	Niger-Congo	Tupian
Australian	Greek	Oto-Manguean	Uralic
Austronesian	Romance	Panoan	Uto-Aztecan
Eskimo-Aleut	Indic	Penutian	
Guahiban	Iranian	Salishan	

González (2003) focuses on phonetic and phonological phenomena. Following Keating (1984, 1990) and Archangeli and Pulleyblank (1994) a modular approach to phonetics and phonology is assumed in which both are strictly separate. The phonological component comprises category-neutralizing, categorical, or obligatory phenomena; partial, variable or gradient phenomena belong to the phonetic component (see for example Keating 1990; Pierrehumbert 1990).[2] Even if the phonetic and phonological modules are considered to be separate, this does not rule out the encoding of phonetic explanations or motivations in the phonology (see Browman and Goldstein 1992; Hayes 1999; and Steriade 1999, among others).

One of the main findings of González (2003) is that three different types of metrically-sensitive alternations occur: (i) strictly stress-sensitive; (ii) sensitive to both stress and foot-structure, and (iii) strictly foot-sensitive. This result is interpreted as providing additional evidence for considering stress and foot structure independent, and as such it will be discussed in more detail in this chapter.

Further exploration of metrically-sensitive alternations focusing on Panoan languages was undertaken in González (2005a, 2005b). The Panoan language family comprises thirty languages spoken in Bolivia, Peru and Brazil (Loos 1999). At least eight (Capanahua, Huariapano [extinct], Shipibo-Konibo, Yaminahua, Amahuaca, Shanenawa, Sharanahua and Matis) are reported to have phonological and/or morpho-phonological alternations in odd or even-numbered syllables that can be interpreted as metrically-sensitive. These alternations may target both individual segments and syllables. The implication is that typological research on

metrical issues contributes to illuminate not only the relationship between stress and foot structure, but also the connections between phonology and morphology.

Overall, this ongoing research program evidences the importance of typological investigation to construe or test linguistic generalizations. The study of diverse and understudied language families such as Panoan is crucial in order to elucidate many issues in linguistic theory. For the line of research outlined above, the ever-growing evidence that stress and foot structure are independent challenges the standard representational and explanatory models dealing with metrical structure. One of the main goals of research in this area is to understand this dichotomy more fully and explore analytical tools that account for the data.

The following pages present in more detail the arguments introduced so far. Section 2 presents phonetic and phonological alternations that suggest that stress and foot structure are not necessarily co-dependent. Strictly stress-sensitive and strictly foot-sensitive alternations are discussed in detail because of their relevance for the argumentation of this chapter. Section 3 focuses on cases of morpho-phonological alternations that are strictly foot-sensitive. Finally, section 4 offers some concluding remarks.

2. Patterns of metrically-conditioned consonantal alternations

As stated above, the cross-linguistic survey of metrically-sensitive consonantal phenomena reported in González (2003) involves phonetic and phonological phenomena targeting consonants in 74 languages from 24 language families. This section discusses the three types of alternations found: strictly stress-sensitive (2.1), stress/foot-sensitive (2.2), and strictly foot-sensitive (2.3).

2.1. Strictly stress-sensitive alternations

Some consonantal alternations are strictly stress-sensitive; crucially, they are not foot-based. This situation may arise at least in two cases: (i) languages with only one stress per word and no evidence for foot structure, as in Senadi (Niger-Congo, Gur), and (ii) languages where alternations occur in a subset of stressed syllables, as in Urubú-Kaapor (Tupian, Tupi-Guaraní).

Senadi has only one stress per word, which falls on the first syllable of the word; it lacks evidence of persistent footing. The consonant inventory is /p, b, t, d, k, g, kp, gb, f, v, s, z, m, (n), (ɲ), (ŋ), l, j, w/ (Mills 1984: 92). Mills (1984) reports various alternations targeting onset consonants that appear to be motivated by stress. Stress is realized as long and fortis articulation of the onset and as intense articulation of that syllable. Onset consonants are longer in stressed syllables than in unstressed syllables; interestingly, vowels are not lengthened under conditions of word stress (Mills 1984: 119). Additionally, in word-medial unstressed syllables /b, d, g/ are spirantized, /p, t, k/ are voiced, /d/ is flapped, and nasals are "slurred over" (Mills 1984: 94, 131; cf. Lavoie 2001: 35).

In Urubú-Kaapor, word-final syllables carry primary stress, while secondary stress is usually (but not always) assigned to alternating syllables to the left of the primary-stressed syllable (Kakumasu 1986: 401). The consonant inventory is /p, t, k, k^w, ʔ, m, n, ŋ, s, ʃ, h, r, w, j/; codas are allowed (Kakumasu 1986: 399). The stops /p, t, k, k^w, ʔ/ lengthen in onsets of main-stressed syllables only (2a–c); lengthening does not take place in secondary-stressed syllables (2c).[3]

(2) Urubú-Kaapor lengthening (Kakumasu 1986: 399, 401)

a.	/katu/	[ka.ˈ**tː**u]	'it is a good'
b.	/kaʔa/	[ka.ˈ**ʔː**a]	'forest'
c.	/nupãta/	[nu.ˌ**p**ã. ˈ**tː**a]	'he will hit'

For the most part, stress-conditioned consonantal phenomena are expected to be aerodynamically or durationally based, since duration and aerodynamic properties are readily conditioned by stress. This seems to be the case in both Urubú-Kaapor and Senadi (in Senadi, consonants are longer and strongly articulated under stress, and shorter and weakly articulated in unstressed contexts).

Additionally, since stress is a phonetic force while foot structure is a phonological construct, strictly stress-sensitive alternations will tend to be characterized by optionality, gradience and variability. One example is Persian (Indo-European, Iranian), where various stress-sensitive consonantal phenomena involve gradience. The consonant inventory of this language includes /p, t, k, b, d, g, q, ʔ, tʃ, dʒ, f, s, ʃ, χ, h, v, z, ʒ, m, n, l, r, j/. Codas are allowed (Samareh 1977: 8–9). Aspiration is reportedly stronger in stressed syllables and word-initially for /p, t, k, tʃ/. /ʔ/ has "emphatic and vigorous" plosion in onsets of initial stressed syllables

(Samareh 1977: 17). Additionally, "lenis" obstruents /b, d, g, j, v, z, ʒ/, which are fully voiced between vowels and in stressed initial positions, are only partially voiced in onsets of unstressed initial syllables (Samareh 1977: 24–25). All of these phenomena are stress-sensitive, gradient, and appear to have aerodynamic motivations. Thus, they are further examples of strictly-sensitive consonantal alternations.

2.2. Stress/foot sensitive alternations

In some cases, stress and footing coincide and it is unclear whether each or both are deterministic. Alternations of this kind are found in English. A number of consonantal alternations in English seem to fall under this category, including aspiration and flapping. Aspiration targets onset voiceless stops and affricates /p, t, k, tʃ/; these consonants are longer and aspirated word-initially (3a) and in stressed syllables (3a, b) and shorter and non-aspirated in unstressed, non-initial syllables (3c) (Lisker and Abramson 1967; Kahn 1980, among others). Since English is mainly a trochaic (head syllable-first) system, it has been argued that aspiration occurs foot-initially (Kiparsky 1979; Hayes 1995; Davis 1999; Davis and Cho 2003); this is shown in the third column in (3).

(3) Aspiration in English

a.	*pond*	[ˈ**pʰ**ɔnd]	[(ˈ**pʰ**ɔnd)]
b.	*append*	[ə.ˈ**pʰ**ɛnd]	[ə.(ˈ**pʰ**ɛnd)]
c.	*happened*	[ˈhɑ.**p**ənd]	[(ˈhɑ.**p**ənd)]

In American English, /t, d/ are usually flapped – i.e., pronounced as very short, voiced stops with incomplete closure – in medial unstressed syllables. This position coincides with non-head syllables in trochaic feet (4) (Kahn 1980; Hayes 1995, among others).

(4) American English flapping

a.	*rider*	[ˈɹaɪ.**ɾ**əɹ]	[(ˈɹaɪ.**ɾ**əɹ)]
b.	*potato*	[pə.ˈtʰeɪ.**ɾ**əʊ]	[pə.(ˈtʰeɪ.**ɾ**əʊ)]

English has main and secondary stresses that are typically assigned rhythmically. More examples of consonantal alternations due to stress/footing are expected to be found in languages with this type of stress

pattern. Additionally, foot structure has not been studied in all of the languages considered in González (2003). Thus, some languages are inconclusive as to whether a consonantal process is strictly stress-motivated, or whether stress and footing coincide in motivating it. This is clearly a matter for further research.

2.3. Strictly foot-sensitive alternations

The third subset of consonantal alternations is strictly foot-sensitive. These are characterized by having a rhythmic or foot-sensitive distribution in spite of the absence of, or a mismatch with, secondary stress. Because stress is not of direct relevance, these alternations are considered to be purely phonological. Probably the clearest case is Huariapano. This language crucially shows a mismatch of stress and foot structure, the latter of which conditions [h] epenthesis (Parker 1994, 1998).

Stress assignment in Huariapano is rhythmically determined. This is a trochaic language with quantity-sensitive primary stress assigned to the rightmost moraic trochee (5a, b). Secondary stress is quantity-insensitive and assigned to syllabic trochees in two different patterns: left-to-right (5c), and right-to-left (5d). The first pattern is quite widespread and occurs about 66% of the time, while the second pattern is found 33% of the time (Parker 1998: 6–10).

(5) Huariapano stress (Parker 1998: 2–5)

a.	[ˈhi.wi]	[(ˈhi.wi)]
	‘branch’	
b.	[ja.ˈwiʃ]	[ja.(ˈwiʃ)]
	‘opossum’	
c.	[ˌkuβ.jaj.βa.ˈʂi.ki]	[(ˌkuβ.jaj.)βa.(ˈʂi.ki)]
	‘I cooked’	
d.	[βis.ˌma.noh.ˌko.no.ˈʂi.ki]	[βis.(ˌma.noh.)(ˌko.no.)(ˈʂi.ki)]
	‘I forgot’	

[h] is epenthesized syllable-finally (i.e., in codas) before voiceless consonants (6a). Epenthesis does not take place if the syllable already has a coda (6b) or in initial syllables with main stress (6c).

(6) Huariapano [h] epenthesis (I) (Parker 1994: 100–109, 1998: 26)

a.	[kɯ**h.**ˈpɯ̃n]	‘(I) open’
b.	[βoʂ.ˈkaʔ]	‘head’
c.	[ˈna.kaʔ]	‘flea’

In non-initial syllables, stress or lack thereof does not determine [h] epenthesis. Epenthesis may occur in unstressed syllables (7a), in main stressed syllables (7b, c), and in secondary stressed syllables (7c). Rather, [h] epenthesis seems sensitive to syllable count: epenthetic [h] never occurs in even-numbered syllables. In (7a, b, d), [h] epenthesis does not take place in the second syllable even if the syllable lacks a coda and the following consonant is voiceless.

(7) Huariapano [h] epenthesis (II) (Parker 1994: 101–102)

a.	[ˌja.na.pa**h**.ˈkwĩŋ]	‘(I) will help’
b.	[ˌˌβo.no.ˈʂi**h**.kæ̃j̃]	‘(they) will take, carry’
c.	[ˌjo.mɯ.ˌɾa**h**.ka.ˈti**h**.kæ̃j̃]	‘(they) hunted’
d.	[ˌiʃ.to.ki.ˈɾaŋ.ki]	‘(it) came running’

Since [h] epenthesis takes place in an alternating fashion in codas of stressed and unstressed syllables alike, Parker (1998) concludes that this phenomenon is rhythmic but not directly related to stress. He proposes the existence of two tiers in Huariapano: a *stress tier* that encodes main and secondary stress, and a *rhythm tier* that encodes the distribution of epenthetic [h] (this is reminiscent of a proposal by Halle and Vergnaud 1987: 66). One example is given for the word [aˌɾi.βah.ˈkaŋ.ki] ‘they repeated’ in (8). The stress tier is formed respecting the metrical constraints that capture main and secondary stress (8a). In the rhythm tier, quantity-insensitive trochees are formed left-to-right. Epenthesis of [h] takes place in the head syllable of every foot in the rhythmic tier, provided the syllable does not have a coda and the following consonant is voiceless.

(8) Huariapano metrical tiers (adapted from Parker 1998: 35)

a.	Stress tier	a.(ˌɾi. βa.) (ˈkaŋ.ki)
b.	Rhythm tier	(a.ɾi.) (βa**h̃**.kaŋ.) ki

Regardless of what analysis is used to capture [h] epenthesis in Huariapano (see Parker 1998 and González 2003), it is clear that this phenomenon involves a mismatch between stress and foot structure. Thus,

this is a crucial case that strongly suggests that stress and footing are separate. Interestingly, [h] epenthesis and the most widespread pattern of secondary stress in Huariapano share the same distribution; both apply left-to-right in odd-numbered syllables. This raises the question of what the connection between them is. The possibility that [h] epenthesis developed from or together with secondary stress in this language is a matter for further research.

Capanahua (Panoan) also has consonantal alternations that appear to be rhythmically conditioned without a direct influence of stress. Capanahua has only one stress per word, like other Panoan languages including Matís (Spanghero Ferreira 2000) and Shanenawa (Cândido 2004). Neither Loos (1969) nor Elías-Ulloa (2006), who has recently conducted fieldwork on both Capanahua and Shipibo-Konibo, report secondary stresses in Capanahua. In spite of the absence of acoustic correlates for secondary stress, metrical structure is present. The main stressed syllable of the prosodic word in Capanahua is always associated with high tone, unlike other prosodic heads (Elías-Ulloa, p.c. 2006) Additionally, vowels in head syllables in the prosodic word do not reduce or devoice, unlike vowels in weak syllables. What is perhaps more intriguing is that while head syllables might have glottal stops as codas, non-head syllables cannot (Elías-Ulloa, p.c. 2006).

Stress in Capanahua is located on the first syllable of the word unless the second syllable has a coda consonant (other than the glottal stop) underlyingly (Loos 1969). Codas are restricted to sibilants, nasals and the glottal stop. Other consonants that would be syllabified in syllable-final position delete in the surface form. Details on the behaviour of the glottal stop /ʔ/ in coda position are provided below.

Loos (1969: 182) reports that, in coda, /ʔ/ may be pronounced in odd-numbered syllables only (counting from the beginning of the word); cf. (9a) with (9b), and (9c) with (9d). This is considered to involve deletion of coda /ʔ/ (Loos 1969). Note that in (9b, c), /a/ deletes for independent reasons (for details, see Loos 1969: 146–149).

(9) Capanahua coda /ʔ/ (I) (from Loos 1969: 126, 147, 148, 194)

a.	/taʔno/	[ˈtaʔ.no]
	‘grub’	
b.	/ʔonanaiʔki/	[ˈʔo.na.niʔ.ki]
	‘he knows’	

c.	/βitʃaiʔ/	[ˈβi.tʃi]
	‘I grab’	
d.	/ɾakaʔti/	[ˈɾa.ka.ti]
	‘he lies down’	

Elías-Ulloa (2006) considers this phenomenon to involve glottal coalescence rather than deletion. He finds that when the /ʔ/ is pronounced, the preceding vowel has modal voice with a final creaky stage. When the glottal stop is not pronounced, there is creaky voice for the whole duration of the vowel (Elías-Ulloa, p.c. 2006). Be it deletion or coalescence, this alternation has a rhythmic distribution, since deletion/coalescence takes place in even-numbered syllables only. This distribution is not related to stress; as discussed above, there is only one stress per word in Capanahua.

Alternations involving the evidential morpheme /taʔ-/ and /ɾaʔ-/ ‘probably’ further exemplify this pattern; the underlying glottal stop of both suffixes surfaces only in odd-numbered syllables (10).

(10) Capanahua coda /ʔ/ (II) (Loos 1969:182)

a.	/ʔotʃiti-ɾaʔ-taʔ-ki/	[ˈʔo.tʃi.ti.ɾa.taʔ.ki]
	dog-probably-EV-be	
	‘It is probably a dog.’	
b.	/ʔotʃiti-ma-ɾaʔ-taʔ-ki/	[ˈʔo.tʃi.ti.ma.ɾaʔ.ta.ki]
	dog-NEG-probably-EV-be	
	‘It is probably not a dog.’	

Since counting is usually a signal of foot structure, this distribution can be straightforwardly reinterpreted in metrical terms (Safir 1979; González 2002, among others). Even in the absence of secondary stress, /ʔ/ deletion alternates throughout the word. This is taken as evidence for persistent footing from the beginning of the word. Capanahua is analysed as a trochaic language where coda /ʔ/ might surface in head syllables only regardless of stress (11), and thus, another example of a strictly foot-sensitive consonantal alternation (González 2003). In 11, subscribed H stands for a foot head.

(11) Capanahua coda /ʔ/ (III) (from Loos 1969: 126, 147, 148, 182, 194)

a.	/taʔno/	[($\underset{H}{\text{ˈtaʔ}}$.no)]
	‘grub’	

b.	/ʔonanaiʔki/	[(ʔo.na.)(niʔ.ki)]
	'he knows'	H H
c.	/βitʃaiʔ/	[(ˈβi.tʃi)]
	'I grab'	H
d.	/ɾakaʔt̃i/	[(ˈɾa.ka.) ti]
	'he lies down'	H
e.	/ʔotʃiti-ɾaʔ-taʔ-ki/	[(ˈʔo.tʃi)(ti.ɾa)(taʔ.ki)]
	'It is probably a dog.'	H H H
f.	/ʔotʃiti-ma-ɾaʔ-taʔ-ki/	[(ˈʔo.tʃi)(ti.ma)(ɾaʔ.ta.)ki]
	'It is probably not a dog.'	H H H

The final example in this section concerns Alutiiq (Eskimo-Aleut), a left-to-right iambic language with main stress on the rightmost syllable of the leftmost foot. Closed syllables are heavy only when word-initial, and syllables with long vowels or diphthongs are heavy and stressed (12b) (Van de Vijver 1998: 141–152). In this language, onset consonants may undergo fortition, which involves "pre-closure" and complete lack of voicing for voiceless consonants. According to Van de Vijver (1998) and references therein, fortition (marked in boldface) occurs both foot-initially and word-initially (12).

(12) Alutiiq (Van de Vijver 1998: 143–144, 176)

a.	*taqumaluni*	[(**t**a.ˈqu.) ma. (**l**u.ˌni)]
	'apparently getting it done'	
b.	*anciqua*	[(ˈan.) ci.(ˌ**q**ua)]
	'I'll go out.'	
c.	*akutaq*	[(a.ˈku.) taq]
	'a food'	
d.	*iqllunirtuq*	[(ˈiq).ɬu.(**n**ix.ˈtuq)]
	'He stopped lying.'	
e.	*apqarlaaqa*	[(ˈap). qaʏ.(**l**áa).qa]
	'I always ask her.'	
f.	*apqarlaanka*	[(áp).qaʏ.(**l**án).ka]
	'I always ask them.'	

Fortition does not correlate with stress, since it can occur in stressed and unstressed syllables alike (cf. 12a, b). It occurs foot-initially in disyllabic feet with light or closed syllables (12a, d), in monosyllabic heavy feet

(12b), and in monosyllabic (bimoraic) feet even if the vowel is phonetically shortened (12f). Fortition does not occur in unfooted closed syllables (12c).

Van de Vijver (1998: 143) analyses stressed heavy syllables (as in 12b) as unfooted stress units where fortition can apply. I assume stressed heavy syllables are footed under a binary foot analysis and thus, fortition occurs in foot-initial position in all cases. Additionally, Van de Vijver (1998) analyses word-initial closed syllables as footed with a catalectic syllable, i.e., a silent unstressed syllable. This would make the heavy syllable foot-medial; fortition still applies in this case. Under a foot construction where this syllable forms its own foot, "word initial" fortition falls under "foot initial" fortition.

Summarizing, [h] epenthesis in Huariapano, glottal deletion/coalescence in Capanahua and fortition in Alutiiq are strictly foot-sensitive phenomena. Metrically-sensitive consonantal alternations in these languages provide evidence that stress and footing do not always go hand in hand. Foot structure might be present even in the absence of secondary stress in the language (as in Capanahua) and it may also be in conflict with stress (as in Huariapano). In the case of Alutiiq, fortition targets foot-sensitive positions only. Because stress is not directly responsible for these types of alternations, they are considered to be strictly phonological.

3. Foot-sensitive morpho-phonological alternations

Certain morpho-phonemic alternations in Panoan also appear to be strictly foot-sensitive. They might target vowels (as in Amahuaca, Shipibo-Konibo, Yaminahua and Matis), consonants (as in Amahuaca, Yaminahua and Shipibo-Konibo) and whole syllables (as in Shipibo-Konibo and Yaminahua). A survey is presented in González (2005a); here I focus on examples from Yaminahua.

Yaminahua is a trochaic language with only one stress per word, usually on the first syllable of the word. This language presents a number of morpho-phonological alternations that appear to be sensitive to syllable count. One of them involves the suffix 'on arriving', where the allomorph [-toʃi] occurs after an even number of syllables (13a), and [-tiʃo] after an odd number of syllables (13b) (Faust and Loos 2002:134). This alternation is similar to the alternation of Shipibo-Konibo {-ɾiβi, -ɾiβa} 'again' (Lauriault 1948; González 2003; Elías-Ulloa 2006). The main difference is that in the Yaminahua suffix, both vowels alternate.

(13) Yaminahua {-toʃi, -tiʃo} (from Faust and Loos 2002: 134)

a.	/fitʃi-toʃi-a-fo/	[(ˈfi.tʃi). (to.ʃi.) (a.fo)]
	find-arrive-PST-PL	1 2 3 4 5 6
	‘found on arriving’	
b.	/fa- toʃi-ita/	[(ˈfa.ti.) (ʃo.i). ta]
	say-arrive-yesterday	1 2 3 4 5
	‘said on arriving’	

The way that the vowels in this Yaminahua suffix alternate is not random. Mid vowels (such as [e, o]) are more prominent than high vowels (such as [i, u]) (Prince and Smolenksy 1993). In this suffix, relatively more prominent [o] occurs in the head syllable of a foot, while relatively less prominent [i] is found in the complement (13a,b). Universally, head syllables are more prominent than non-head syllables (Kenstowicz 1994). Thus, the distribution of the allomorphs {-toʃi, -tiʃo} can be understood as the alignment of vocalic sonority within the suffix with prominence within the foot (González 2005a: 51–55, 2005b: 157).

Another morpho-phonological alternation found in Yaminahua involves the suffix {-pake, -pa} ‘going down’. According to Faust and Loos (2002: 132), the allomorph [-pa] occurs if the first syllable of the suffix is even-numbered in the word (14a); [-pake] occurs elsewhere (14b). The data in (14) has been adapted from Eakin (1991: 140) and Faust and Loos (2002: 132); the foot structure analysis is mine.

(14) Yaminahua {-pake, -pa}

a.	/ka-pake-ni/	[(ˈka.**pa**.) ni]
	go-down-REM	
	‘went down’	
b.	/ni-pake-naka/	[(ˈni.**pa**.) (na.ka)]
	live-in.series-FUT.PROG	
	‘will live forever’	
c.	/kene-pake-ni/	[(ˈke.ne.)(**pa.ke**.) ni]
	write-in.order-REM	
	‘wrote in order’	
d.	/tsao-pake-kafa-ita/	[(ˈtsa.o) (**pa.ke**.) (ka.fa.) (i.ta)]
	sit-down-lateral-yesterday	
	‘(I) sat down’	

The distribution of {-pake,-pa} can be straightforwardly reinterpreted in metrical terms: the right edge of this suffix is aligned with the right edge of a metrical foot (González 2005b: 162). In (14a,b), the allomorph [-pa] is selected; in both cases, the right edge of the suffix is perfectly aligned with the right edge of the foot where it is parsed. If the allomorph [-pake] had been selected instead in (14a,b), the suffix 'going down' would spread over two different feet; cf. *[(ˈka.**pa.**) (**ke**.ni)] and *[(ˈni.**pa**.) (**ke**.na) ka]. In these unattested forms, the right edge of the second syllable of the suffix is misaligned by two segments with respect to the right edge of second foot.

The same applies in examples (14c,d), where [-pake] is selected. In both cases, the right edge of 'going down' is perfectly aligned with the right edge of the foot. If [-pa] had been selected, the right edge of the suffix 'going down' would be misaligned with the right edge of the foot by two segments; cf. attested (14c,d) with plausible *[(ˈke.ne.) (**pa**.ni)] and *[(ˈtsa.o) (**pa**.ka.) (fa.i) ta].

The morpho-phonological alternations from Yaminahua presented here are strictly determined by foot structure, like the phonological alternations in Capanahua and Huariapano (Section 2.3). Phonological alternations in Panoan typically involve consonants, but morpho-phonological alternations also target vowels and syllables. Except Amahuaca, which has both phonological and morpho-phonological alternations, the rest of the Panoan languages examined so far are limited to one type or the other.

4. Concluding remarks

This chapter has presented evidence from metrically-sensitive consonantal alternations arguing that stress is not necessarily tied to foot structure. The examples presented here originate from a survey of a large number of language families and exemplify three typological possibilities; consonantal alternations might be strictly stress-sensitive, strictly foot-sensitive, or conditioned at the same time by stress and footing. It has also been shown that phonological alternations are not unique in this respect, since morpho-phonological alternations that appear to be conditioned strictly by foot structure are also attested.

This line of investigation contributes to our understanding of metrical structure. Supporting conclusions from previous research (see Section 1), it is found that stress and footing do not always go together. In some cases, languages use stress in a non-rhythmic manner, meaning that no footing

structure applies. In other cases, stress and foot structure coincide. Yet in a third case, footing applies throughout words, even in the absence of secondary stresses or in the event of a conflict with stress. Rhythmicity is achieved in many languages, but not always necessarily involving stress. Other factors, including vocalic or consonantal alternations, can create rhythmicity.

Many of the relevant examples of foot-sensitive alternations are taken from Panoan. The study of this language family is important for linguistic theory for several reasons. First, Panoan languages are mostly endangered and generally understudied. Second, this language family has not received much attention in the literature so far, possibly because much of the information about Panoan is written in Spanish or Portuguese and thus is not easily accessible to many researchers. Third, its phonology and morpho-phonology is very interesting typologically; it presents metrically-sensitive alternations that target consonants, vowels and syllables that are conditioned, in part or whole, by rhythmic considerations without regard to stress.

The line of research briefly described here also contributes to the understanding of the relationship between phonetics, phonology and morphology. But more generally, the careful examination of data from understudied languages and diverse language families is important in that it illustrates patterns that can refine our understanding of linguistic phenomena and linguistic theory.

Because of lack of space, this chapter has not addressed how to account for metrically-sensitive alternations in the grammar. For a proposal using the Optimality Theoretic framework, see González (2003, 2005a, 2005b). The essential idea behind Optimality Theory (Prince and Smolensky 1993) is that different phonological forces (constraints) are in conflict with each other in the grammar, and optimal (attested) forms arise from the resolution of these conflicts. This framework is well-suited for the analysis of stress and footing as separate forces that might work together in some cases but not in others. The introduction of constraints that encode prominence relations between strong and weak syllables of a foot without direct reference to stress can be used to analyse both the phonological and morphological alternations described in this chapter.

Further investigation will be necessary to find additional examples that clearly belong to one of the three types of alternations discussed in this chapter. The general contexts where stress-sensitive, foot-sensitive and mixed stress/foot sensitive alternations are found also need to be explored

further. These and other related issues are part of a wider research agenda that considers typology an essential tool to illuminate the rich diversity of linguistic patterns and reach true linguistic generalizations.

Notes

1. I am extremely grateful to the editors of this volume and to two anonymous reviewers for their comments and suggestions on the content of this chapter. I also thank José Elías-Ulloa for his comments and for generously providing information about Capanahua. Of course, any remaining errors or shortcomings are solely my responsibility. The abbreviations used in this chapter include: EV evidential, FUT future, H foot head, NEG negation, PST recent past, PL plural, PROG progressive, and REM remote past. Note that throughout the paper, unless otherwise noted, data is transcribed according to the conventions of the International Phonetic Alphabet (IPA).
2. Of course, a number of phenomena do not clearly fall into one or the other category; for example, category-neutralizing but variable, or obligatory but partial. Further investigation might clarify where precisely these cases belong.
3. Kakumasu (1986) represents lengthening by consonant doubling; here I use the symbol [ː].

References

Archangeli, Diana, and Douglas Pulleyblank
1994 *Grounded Phonology*. Cambridge, Massachusetts: MIT Press.
Beckman, Jill
1997 Positional faithfulness, positional neutralization and Shona height harmony. *Phonology* 14: 1–46.
1998 Positional faithfulness. Ph. D. diss., University of Amherst, Massachussets: GLSA.
Blevins, Juliette, and Andrew Garrett
1998 The origins of consonant-vowel metathesis. *Language* 74: 508–556.
Browman, Catherine, and Louis Goldstein
1992 Articulatory phonology: An overview. *Phonetica* 49: 155–180.
Cândido, Cláucia Vieira
2004 Descrição morfossintática da língua shanenawa (pano) [Morphosyntactic description of the Panoan language Shanenawa]. Ph.D. diss., Unicamp, Brasil.

Crosswhite, Katherine
1999 Vowel reduction in Optimality Theory. Ph.D. diss., Department of Linguistics, University of California, Los Angeles.
Crowhurst, Megan J.
1991 Minimality and foot structure in metrical phonology and prosodic morphology. Ph.D. diss., University of Arizona, Tucson. [Distributed by Indiana University Linguistics Club, Bloomington.]
1996 An optimal alternative to conflation. *Phonology* 13: 409–424.
Davis, Stuart
1999 The parallel distribution of aspirated stops and /h/ in American English. *Indiana University Working Papers in Linguistics* 1: 1–10.
Davis, Stuart, and Mi-hui Cho
2003 The distribution of aspirated stops and /h/ in American English and Korean. An alignment approach with typological implications. *Linguistics* 41: 607–652.
Delattre, Pierre
1969 An acoustic and articulatory study of vowel reduction in four languages. *International Review of Applied Linguistics* 7: 295–325.
Eakin, Lucille
1991 *Lecciones para el Aprendizaje del Idioma Yaminahua*. Yarinacocha, Perú: Ministerio de Educación e Instituto Lingüístico de Verano.
Elías-Ulloa, José
2006 Theoretical aspects of Panoan metrical phonology: Disyllabic footing and contextual syllable weight. Ph.D. diss., Department of Linguistics, Rutgers University.
Faust, Norma, and Eugene Loos
2002 *Gramática del Idioma Yaminahua*. Yarinacocha, Perú: Instituto Lingüístico de Verano.
Flemming, Edward
1994 The role of metrical structure in segmental rules. In *Proceedings of the North-Eastern Linguistics Society 24*. Vol. 1, M. González (ed.), 97–110. Amherst, Massachusetts: GLSA.
Goldsmith, John
1990 *Autosegmental and Metrical Phonology*. Oxford: Blackwell.
González, Carolina
2002 The effect of prosody on glottal stop deletion in Capanahua. In *Proceedings of the North East Linguistics Society (NELS) 32*, Masako Hirotani (ed.), 133–152. Amherst, Massachusetts: GLSA.
2003 The effect of stress and foot structure in consonantal processes. Ph.D. diss., Department of Linguistics, University of Southern California.
2005a Phonologically-conditioned allomorphy in Panoan: Towards an analysis. In *Working Papers in Phonology 6 (UCLA Working*

Papers in Linguistics 11), Jeff Heinz, Andy Martin, and Katya Pertsova (eds.), 39–56. [<http://www.linguistics.ucla.edu/faciliti/wpl/>.]

2005b Segmental alternations in Yaminahua. In *Proceedings of the 24th West Coast Conference on Formal Linguistics (WCCFL)*, John Alderete, Chung-hye Han and Alexei Kochetov (eds.), 155–163. Somerville, Massachusetts: Cascadilla Proceedings Project. [<http://www.lingref.com, document #1218>.]

Halle, Morris, and Jean-Roger Vergnaud

1987 *An Essay on Stress*. Cambridge, Massachusetts: MIT Press.

Hammond, Michael

1984 Constraining metrical theory: A modular theory of rhythm and distressing. Ph.D. diss., Department of Linguistics, University of California, Los Angeles. [Distributed by Indiana University Linguistics Club, Bloomington.]

Hayes, Bruce

1981 A metrical theory of stress rules. Ph.D. diss., MIT (1980). Revised version distributed by Indiana University Linguistics Club, Bloomington, and published by Garland Press, New York 1985.

1995 *Metrical Stress Theory: Principles and Case Studies*. Chicago: University of Chicago Press.

1999 Phonetically-driven phonology: The role of Optimality Theory and Inductive Grounding. In *Functionalism and Formalism in Linguisitcs, Vol. I: General Papers,* Michael Darnell, Edith Moravcsik, Michael Noonan, Frederick Newmeyer, and Kathleen Wheatly (eds.), 243–285. Amsterdam: John Benjamins.

Hewitt, Mark

1992 Vertical maximization and metrical theory. Ph.D. diss., Brandeis University, Waltham, Massachusetts.

Idsardi, William J.

1992 The computation of prosody. Ph.D. diss., MIT.

Kager, René

1989 *A Metrical Theory of Stress and Distressing in English and Dutch*. (Linguistic Models 14.) Foris: Dordrecht.

Kahn, Daniel

1980 *Syllable-Based Generalizations in English Phonology*. New York: Garland.

Kakumasu, James Y.

1986 Urubu-Kaapor. In *Handbook of Amazonian Languages*. Vol. 1; Desmond C. Derbyshire and Geoffrey K. Pullum (eds.), 326–403. Berlin/New York: Mouton de Gruyter.

Keating, Patricia
1984 Phonetic and phonological representation of stop consonant voicing. *Language* 60: 286–319.
1990 Phonetic representations in a generative grammar. *Journal of Phonetics* 18: 321–334.
Kenstowicz, Michael
1994 Sonority-driven stress. Ms., MIT. [Rutgers Optimality Archive 33, <http://roa.rutgers.edu>.]
Kiparsky, Paul
1979 Metrical structure assignment is cyclic. *Linguistic Inquiry* 10: 421–441.
Ladefoged, Peter
2006 *A Course in Phonetics*. 5th ed. [1st ed. 1975] Boston, MA: Thomson Wadsworth.
Lavoie, Lisa
2001 *Consonant Strength: Phonological Patterns and Phonetic Manifestations*. New York: Garland.
Lauriault, James
1948 Alternate mora timing in Shipibo. *International Journal of American Linguistics* 14: 22–24.
Liberman, Mark
1975 The intonational system of English. Ph.D diss., MIT.
Liberman, Mark, and Alan Prince
1977 On stress and linguistic rhythm. *Linguistic Inquiry* 8: 249–336.
Lisker, Leigh, and Arthur Abramson
1967 Some effects of context on voice onset time in English stops. *Language and Speech* 10: 1–28.
Loos, Eugene
1969 *The Phonology of Capanahua and its Grammatical Basis*. Norman: Summer Institute of Linguistics and the University of Oklahoma.
1999 Pano. In *The Amazonian Languages*, R.M.W. Dixon and Alexandra Y. Aikhenvald (eds.), 227–250. Cambridge: CUP.
McCarthy, John and Alan Prince
1996 Prosodic morphology 1986. Report #32. New Brunswick, NJ: Rutgers University Center for Cognitive Science.
Mills, Elizabeth
1984 *Senoufo Phonology. Discourse to Syllable (A Prosodic Approach)*. Summer Institute of Linguistics and University of Texas at Arlington.
Parker, Steve
1994 Coda epenthesis in Huariapano. *International Journal of American Linguistics* 60: 95–119.

1998 Disjoint metrical tiers and positional markedness in Huariapano. Unpublished manuscript. Amherst: University of Massachusetts.

Pierrehumbert, Janet

1990 Phonological and phonetic representation. *Journal of Phonetics* 18: 375–394.

Prince, Alan

1983 Relating to the grid. *Linguistic Inquiry* 14: 19–100.

Prince, Alan, and Paul Smolensky

1993 Optimality Theory: Constraint interaction in generative grammar. (Technical report RuCCS-TR-2.) New Brunswick, NJ: Rutgers University Center for Cognitive Science. [Rutgers Optimality Archive 537, <http://roa.rutgers.edu>.]

Safir, Ken

1979 Metrical structure in Capanahua. In *MIT Working papers in Linguistics, Vol. 1, Papers on Syllable Structure, Metrical Structure and Harmony Processes,* Ken Safir (ed.), 95–114. Cambridge, Mass: MIT.

Samareh, Yadollah

1977 *Arrangement of Segmental Phonemes in Farsi*. Tehran: Tehran University Publications.

Selkirk, Elisabeth

1984 *Phonology and Syntax: The Relationship between Sound and Structure*. Cambridge, Mass.: MIT Press.

Smith, Jennifer

2002 Phonological Augmentation in Prominent Positions. Ph.D. diss., University of Massachusetts, Amherst. [Rutgers Optimality Archive 570, <http://roa.rutgers.edu>.]

Spanghero Ferreira, Vitória Regina

2000 *Lingua Matis (Pano): Uma Análise Fonológica* [The Matis Language (Panoan): A phonological analysis]. (Lincom Studies in Native American Linguistics 39.) München: Lincom Europa.

Steriade, Donca

1999 Phonetics in phonology: The case of laryngeal neutralizations. *Papers in Phonology 3 (UCLA Working papers in Linguistics 2);* Matt Gordon (ed.), 25–145. Department of Linguistics, University of California.

Suzuki, Keiichiro

1998 A typological investigation of dissimilation. Ph.D. diss., University of Arizona.

Van de Vijver, Ruben

1998 *The Iambic Issue. Iambs as a Result of Constraint Interaction*. Leiden: Holland Institute of Generative Linguistics.

Walker, Rachel
1997 Mongolian stress, licensing, and factorial typology. Ms., University of California, Santa Cruz. [Rutgers Optimality Archive 171, <http://roa.rutgers.edu>.]

Tone in Bodish languages: Typological and sociolinguistic contributions

Kristine A. Hildebrandt

1. Introduction: The challenge of Bodish prosodic systems

The prosodic systems of Bodish Tibeto-Burman (TB) languages of Nepal present many challenges to our understanding of the phonological profiles of Sino-Tibetan (ST) languages, and to languages of South and Southeast Asia in general.[1] This paper aims to highlight some interesting suprasegmental properties in several Bodish languages, and the ways that tone and the Tone Bearing Unit (TBU) in these languages contribute to their location in a typologically distinct sub-area between greater South and Southeast Asia. The proposed location of Bodish languages in a "buffer zone" (cf. Stilo 2005 for Northwest Iran as a typological buffer zone between Arabic-type and Indic-type areas) is not new here; rather, this account gives additional, phonological, evidence for such a proposal.

At the same time, a deeper understanding of Bodish prosodic properties is complicated by sociolinguistic variables affecting the realization of tone, including gender, bilingual contact, and formal education. Therefore, another aim of this paper is to synthesize the ways in which these sociolinguistic variables have enriched previous studies, and how an optimal account of a language's phonology is one that recognizes how synchronic sub-systems and mechanisms of diachronic change align with different components of the speaker community.

The organization of this paper reflects the diversity of the goals. In Section 2, I provide an overview of the tonal properties of a number of Bodish TB languages of Nepal and how these properties necessarily complicate an idea of mainly syllabic tone systems in ST languages. This point is elaborated on in Section 3, where I show in two surveys that the type and domain of tone systems of the Bodish (and other TB) languages, located along the Himalayan range of Nepal, India and Bhutan, provide additional evidence for typological enclave effects (cf. Bickel and Nichols 2003). In Section 4, I turn to the complex variation inherent in these systems,

whereby the parameters to tone in Bodish languages have different realizations according to different socio-cultural factors.

2. Tone and the phonological word in Bodish languages

As noted by Matisoff (1999) the topic of Sino-Tibetan tonology is too vast to be adequately summarized in a single account. It is important to belabor the point here, however, that once the focus is shifted away from the prototypical "omnisyllabic" nature of Sinitic languages, the tone profiles begin to take on intriguingly different and complex dimensions.

2.1. Tone in Sinitic and in Tibeto-Burman languages

Despite the wide variety of tone profiles within the family, a popular assumption in literature is that the TBU in ST languages is the syllable. Moira Yip's 2002 survey of Asian (including ST) tone systems focuses almost exclusively on monosyllabic languages like Mandarin and Cantonese, with brief mention of other monosyllabic TB languages like Bai and Jingpho. While there is some discussion of Lhasa Tibetan tone with its additional phonation correlates, and also mention of word-tone in languages of Papua New Guinea, the received perception is of an overall syllabic TBU profile of ST and TB languages.

It is in fact true that a monosyllabic tone profile fits for many ST languages of Southeast Asia. Morphemes (lexical and grammatical) are largely monosyllabic, and many phonological processes make exclusive reference to individual syllables (cf. Matisoff 1973b, 1995, 1999). Lahu (Lolo-Burmese) is a textbook case of this, with potentially long combinations of mono-syllabic morphemes bearing individual, underlying tone properties: "The Lahu tones do not exhibit any strictly automatic, phonologically conditioned sandhi-behavior." (Matisoff 1973a: 27). This is illustrated in (1) (data from Matisoff 1973a: 454).

(1) Lahu (Sino-Tibetan, Lolo-Burmese)

šɨ́	*e*	*thâ*	*gà*	*qo* [2]
die	PTCL	when	arrive	TOP

'If [the time to] die arrives…'

In fact, in Lahu there is only a single case of tone alternation between adjacent syllable-morphemes: Tone lowering on certain property concept root morphemes when followed by an adverbializer particle *ɛ̀* (e.g., /ši-ɛ̀/ → [šɪ̌.ɛ̀] 'yellow-ly') (1973a: 30). Thus, the strictly syllabic TBU obscures any notion of *word* as prosodically distinct from the syllable.

But, as Yip (2002: 172–173) duly notes, words (in a grammatical sense) in Southeast Asian languages can be polysyllabic, frequently formed via compounding. In Sinitic languages in particular, morpheme concatenations may undergo various tonal changes. But even in tone sandhi environments, the general idea is that a word-level pattern is the result of changes to at least one syllable with an otherwise underlying, contrastive tone.

Beyond the profile characteristic of Southeast Asian languages, we may also find TB languages (largely) west of the Himalayan plateau to be either a-tonal (e.g., Himalayish languages and some Tibetan 'dialects'), or 'marginally/incipiently tonal', where tone is a combination of two or more phonetic properties like vowel F_0 and consonant or vowel laryngeal settings (i.e., phonation types) (cf. Stephen Watters 1999 and 2002 for studies of several Tibetan-type languages).

Kyirong Tibetan is an example of this second type. It has six phonemic tones and resembles Sinitic type systems by virtue of polytonicity. However, this system is complex in that vowel F_0 is only one of a number of relevant correlates, summarized in Table 1.[3]

Table 1. Kyirong Tibetan tones (Huber 2002: 22–24)

Registers	Correlates	Cases
High Level	Modal; voiceless asp.	*tʰō* 'list'; *tō* 'food'
High Falling	Modal/Creaky; voiceless asp.	*tɕʰò:* 'religion'; *ʈù:* 'stir'
Mid Level	Modal; ± voiced	*to̲* 'two'; *do̲* 'lower valley'
Mid Falling	Modal/Creaky; ± voiced	*ʈô:* 'heat'; *dzô:* 'magazine'
Low Level	Breathy; ± voiced	*to̲ʱ* 'stone'
Low Falling	Breathy; ± voiced	*tŷ:ʱ* 'evil spirit'

There are additional correlates of vowel phonation found across the three registers: Vowel phonation (modal, breathy and occasionally creaky for contour tones), and onset (obstruent) phonation for consonants.

While it is shown in Section 2.2 that Bodish languages may be typed as marginally tonal due to multiple phonation types, the domain of the TBU also makes them of special typological interest in this account.

2.2. Bodish tone and the phonological word

Figure 1 shows the genetic sub-grouping of the Tibeto-Burman sub-family:

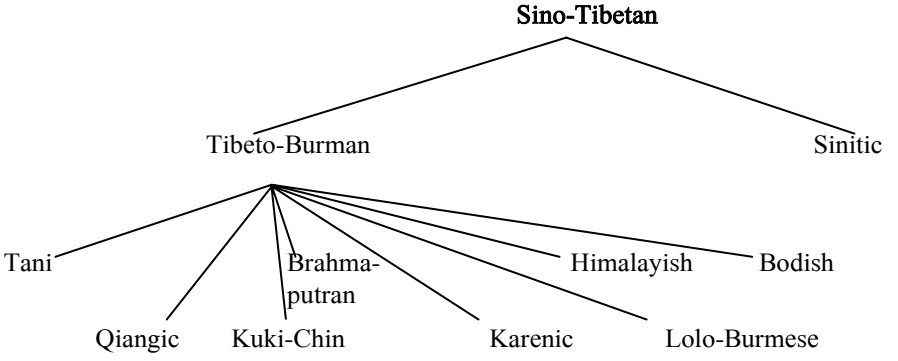
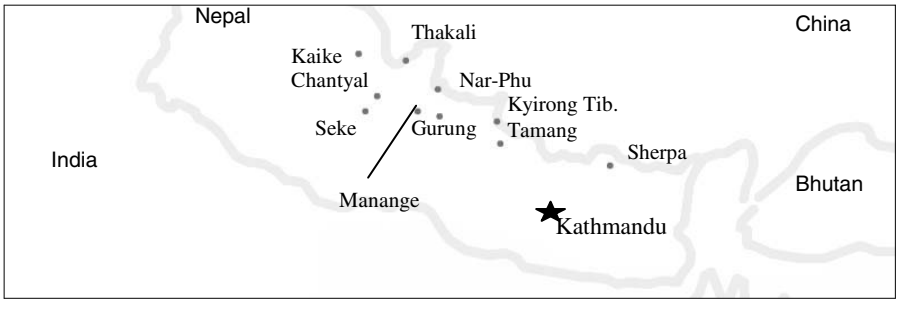


Figure 1. Sub-grouping of Sino-Tibetan and Tibeto-Burman

The Bodish sub-grouping includes Tamangic languages and the Tibetan "dialects". Tamangic languages include Tamang, Gurung, Thakali, Manange, Nar-Phu, Chantyal, Kaike and Seke/Tangbe, displayed in Map 1.[4]



Map 1. Geographic location of selected Bodish languages

These languages complicate an otherwise perceived binary typological opposition within the family (i.e., tonal or a-tonal/marginally tonal, with a syllabic TBU). For a number of Bodish (and also Kuki-Chin) languages of the Nepal Himalaya (specifically, those languages surrounded by the Brahmaputra river, which runs through the Kailash range, through southwest Tibet to the Ganges in India), the TBU expands in complex and interesting ways. I now provide a brief description of three Bodish (Tamangic) languages and how their representative tone profiles expand the notion of the TBU, revealing the relevance of the phonological word in ST languages.

2.2.1. Tamang

An early and in-depth account of Bodish tone *par excellence* is found in Mazaudon (1973), with a phonological and phonetic description of (Risiangku) Tamang tone. The phonetic realization of the four tones is the 'phonological word', with the same patterns of pitch correlates on monosyllabic words also found on polysyllabic words, regardless of morphological composition or lexical class. Tamang has four tones that are different in pitch height (high and low) and in pitch contour (level and falling). In addition, there is a voice quality difference for the two heights: The high tones have modal vowels and the low tones have breathy vowels (Mazaudon 1973: 82), illustrated in Table 2.

Table 2. Tamang tones (Adapted from Mazaudon 1973: 94–98)

Tone	Correlates	Case
/1/	High Falling, Modal	*tʃʰi* 'exclamation of dislike'
/2/	High Level, Modal	*tʃʰi* 'grass'
/3/	Low Level, Breathy	*tʃi̤ː* 'grip'
/4/	Low-Rising, Breathy	*tʃi̤ː* 'think, remember'

In Mazaudon's phonetic account of the tones in different syllable structures and phrase types, she shows that Tamang is a *word-tone* language; the pitch properties of the tones carry across the stem, including bound "grammatical morphemes" (i.e., suffixes).[5] Because suffixes are inherently atonal and pick up the pitch properties of a preceding syllable, it is possible that two morphologically distinct, but segmentally identical suffixes, when occurring with roots that are also both segmentally and tonally homophonic, are (without appropriate context), indistinguishable to Tamang speakers, shown in example (2) (1973: 70).[6]

(2) /ˀta=ri/ axe=INDEF 'an axe' vs. /ˀta=ri/ horse=LOC 'on the/a horse'

2.2.2. Gurung

This summary of Kaski Gurung (Ghachok, Nepal) is synthesized from several accounts: Glover (1970), Glover, Glover, and Gurung (1977), Glover and Landon (1980), Hale (1973), Mazaudon (1978), Sprigg (1997). The system is essentially the same as with Tamang, where tone is based on

vowel phonation type (i.e., "register" in accounts of Gurung), and vowel F_0 (i.e., "accent"). The correlates are linked; breathy vowels associate with low F_0, and modal vowels associate with high F_0. In addition, there is a similar consonant onset correspondence seen with Tamang. *Voiced* onset are found only with breathy vowels, while voiceless aspirated onsets are found only with modal vowels, giving rise to a four-way system, illustrated in Table 3.

Table 3. Gurung tones on monosyllabic roots (Mazaudon 1978: 175–178)

Tone	Correlates	Cases
/1/	Modal, High and level	*pʰo* 'deer'
/2/	Breathy, High Falling	*pʰo̤* 'belly
/3/	Modal Low level/falling	*po* 'beer mash'
/4/	Breathy Low level/falling (or rise-fall)	*po̤* 'strength'

An initial analysis by Glover (1970) was that the domain for contrastive tone is the morpheme. However, Hale (1973) noted that a word will have maximally one accent, and vowel phonation is realized only on the initial syllable of a word, no matter the morphological complexity. Mazaudon (1978: 162) has also noted that disyllabic morphemes show the same pitch patterns as bimorphemic, polysyllabic combinations, as in Table 4.

Table 4. Tone patterns on Gurung stems (Adapted from Sprigg 1997: 451)

/1/	/2/	/3/	/4/
ʃí-lá	*ʃə̂-lâ*	*tʃîː-là*	*jô̤-là*
die-PERF	know-PERF	bite-PERF	steal-PERF

Thus, as with Tamang, the phonological word (henceforth, P-word) in Gurung is the most appropriate TBU; it is a category that captures the necessary interplay between prosodic notions (e.g., syllable, foot) and morphological ones (e.g., root, stem, affix).

2.2.3. Manange

Tone in Manange is diachronically more phonologized than in other Bodish languages in that contrastive pitch is now the primary correlate to tone, and other correlates are secondary in that they do not apply for all of the

tones (cf. Mazaudon 1977). In this sense, Manange is furthest along the tonogenetic pathway to becoming a "pure", pitch-based tone language.

Manange has four tones aligning primarily along a parameter of contrastive vowel pitch. Figure 2 shows lines linking the starting, midpoint and endpoint mean F_0 measurements taken from lexical items from the four tones (reproduced from Hildebrandt 2005: 26).

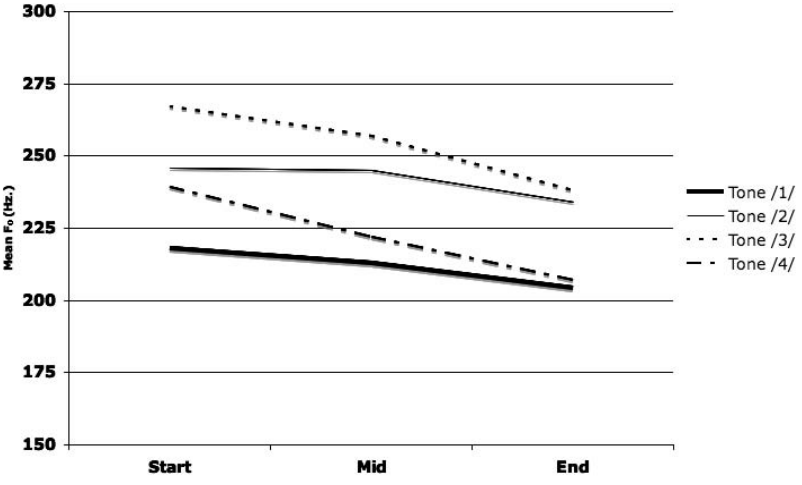


Figure 2. Mean F_0 measurements, four tones, Manange

As with the other Bodish languages, there are two low tones and two high tones, with a further division into level and falling tones. Words with initial sonorant consonants are found in all four tones, and display the same pitch properties in all tones as do words with initial obstruents. For obstruent initials, there is a further parameter: Onset aspiration. As tokens in Table 5 show, the two contour tones (/3/ and /4/) are split for aspiration.

Only words with *unaspirated* obstruent onsets occur in tone /3/, while only words with *aspirated* onsets occur in tone /4/. This split is not observed for words with sonorant initials, such that F_0 is the primary tonal correlate. Aspiration distinctions have secondary significance, applying for obstruent-initial words in two tones.

Table 5. Onset aspiration differences across tones (Hildebrandt 2003: 15)

/1/		/2/		/3/		/4/	
+ Asp	-Asp	+ Asp	- Asp	+ Asp	- Asp	+ Asp	- Asp
p^{h}i	*pĩ*	*p^{h}i*	*pi*	n/a	*pi*	*p^{h}li*	n/a
'late'	'give'	'peel'	'release'		'say'	'four'	
t^{h}ẽ	*te*	*t^{h}ẽ*	*te*	n/a	*tẽ*	*t^{h}e*	n/a
'move'	'dig'	'stop'	'remove'		'fasten'	'pin'	

As with other Bodish languages, the TBU in Manange is the P-word, including the mono- or polysyllabic root or stem morpheme and bound affixes and clitics. So, a single pitch trajectory also spreads across morphologically complex P-words. Figure 3 shows lines for the (mean) starting, mid-point and ending F_0 values of a near-minimal set of verbs, all with the nominalizing suffix *-pʌ* (reproduced from Hildebrandt 2005: 31).

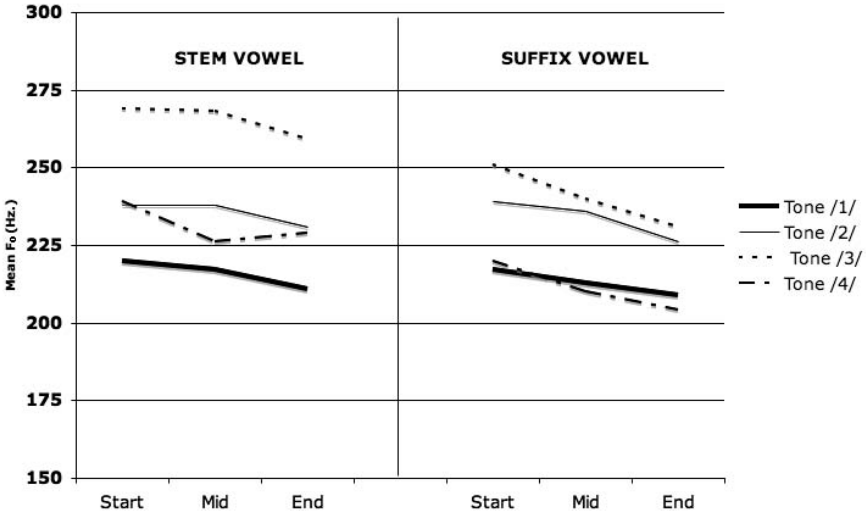


Figure 3. Mean F_0 measurements, verb stem + suffix, Manange

The F_0 values spread from root across suffix syllables, indicating that phonologically bound grammatical morphemes are inherently toneless.

2.3. Summary

There are other word-tone Bodish languages, including Sherpa (Watters 1999; Kelly 2004), Seke/Tangbe (Honda 2002), Thakali (Georg 1996), and

Nar-Phu (Noonan 2003). Other Bodish languages, like Kyirong Tibetan, are hybrid between word-tone and syllabic, with some morphemes as tonal, and others a-tonal (Huber 2002; Hall and Hildebrandt, forthcoming). In addition, at least one non-Bodish language (Meithei, Kuki-Chin) has the P-word as the TBU.

Thus, even a qualitative survey of Bodish necessarily complicates the strictly syllabic view of Sino-Tibetan prosodic systems. A closer look at the nature of tone and the TBU shows that both Bodish, and languages from other TB sub-groupings located in the Himalayan region, stand apart from other related languages in this way.

3. A crosslinguistic survey of tone types and tone domains

This study concerns two hypotheses about the nature of tone in a set of Sino-Tibetan languages in a proposed sub-area straddling South and Southeast Asia. While the findings are most relevant to Bodish languages, a Himalayish language also identified as a buffer zone language (Kham) also shows similar tone properties. Therefore, the findings can at least preliminarily be extended beyond the more narrow genetic parameters to include geographic ones.

The idea that this sub-area is unique is inspired by Bickel and Hildebrandt (2005), who, following Stilo's (2005) terminology, propose "buffer zone" status for languages from the central Himalayan region of the Nepal/Tibet based on some features. A buffer zone is more specifically defined here as a geo-cultural area of mixed typology, and it is the hybrid nature of tone that marks this part of the Himalaya as noteworthy. The seventeen-language sample (in Table 6) in this study largely represents the major sub-groupings of Sino-Tibetan.[7]

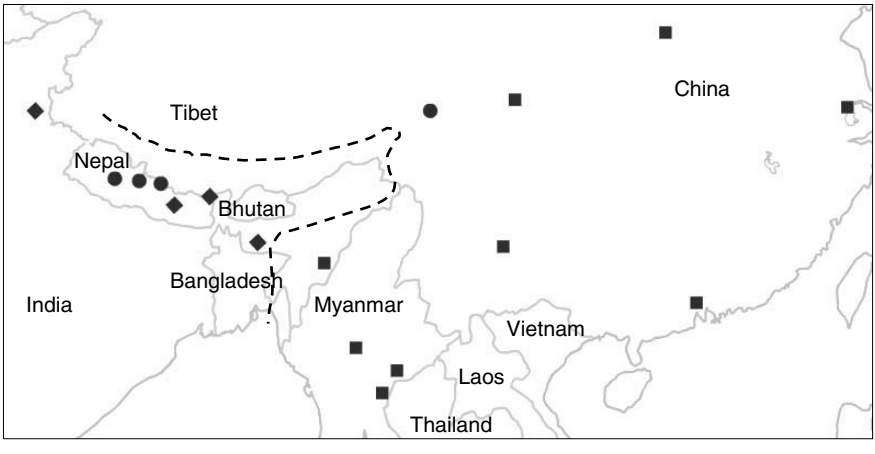
These languages are plotted in Map 2, along with a rough trajectory of the Brahmpatura River (dashed line).

There is some oversampling within both sub-families, and while the Sinitic languages appear under-represented here, further sub-divisions within Sinitic are debated. In addition, the Bodish and Himalayish languages in the sample represent different further internal divisions.[8]

The languages in the sample are further divided into three spheres. The Sinosphere and the Indosphere were proposed by Matisoff (1991: 485–486) as defined by a combination of cultural and linguistic features, and is further characterized here with geographic delineations provided by me, following Bickel and Nichols (2003).

Table 6. Language sample

Language	Sub-grouping	Description source
Burmese	Lolo-Burmese	Matisoff (1999); Green (2004)
Cantonese	Sinitic	Bauer and Matthews (2003); Goddard (2005)
Dege Tibetan	Bodish	Häsler (1999)
Dolakha Newar	Himalayish	Genetti (1994)
Dulong	Nungish	LaPolla (2003)
Garo	Brahmaputran	Burling (2003)
Eastern Kayah Li	Karenic	Solnit (1997)
Kham	[Remnant] Himalayish	David Watters (2002)
Kinnauri	[West] Himalayish	Sharma (1988)
Kyirong Tibetan	Bodish	Huber (2002)
Lahu	Lolo-Burmese	Matisoff (1973a, 2003)
Limbu	Kiranti	van Driem (1987)
Manange	Bodish, Tamangic	Hildebrandt (2003, 2005)
Mandarin	Sinitic	Li & Thompson (1981); Duanmu (2000)
Meithei	Kuki-Chin	Chelliah (1997)
Qiang	Qiangic	LaPolla and Huang (2003)
Wu	Sinitic	Zee and Xu 2003



Map 2. Map of seventeen Sino-Tibetan languages (See [4] for the legend)

(4) Three spheres

A. The Sinosphere (Burmese, Cantonese, Dulong, Eastern Kayah Li, Lahu, Mandarin, Meithei, Qiang, Wu)

The Sinosphere is geographically east of the Brahmaputra river. Culturally it has been defined by Matisoff as a zone of early Han influence, extended rice-based agricultural practices, and therefore multiple terms coding the meaning 'rice'. Linguistically, Sinospheric languages are characterized by (strict) monosyllabicity, elaborate tone systems, and/or rudimentary morphology (Matisoff 1991: 485). The Sinospheric languages in this study are represented by square symbols (■) in Map 2.

B. The Indosphere (Dolakha Newar, Kinnauri, Garo, Limbu)

Geographically, Indospheric languages lie mainly west of the Brahmaputra River, also mainly westward of the Tibetan Plateau. Culturally, this area is defined by the presence of "Kingship" ideas and Hindu-Buddhist religious traditions, and by the presence of Devanagri-based writing systems (Matisoff 1991: 485). Linguistically, Indospheric languages are characterized by a-tonal (or incipiently tonal) phonology, with polysyllabicity and more complex morphology. They are represented by diamond symbols (♦) in Map 2.

C. The buffer zone (Dege Tibetan, Kham, Kyirong Tibetan, Manange)

Geographically, the buffer zone in this account is based mainly along the Tibetan Plateau. Culturally, elements of both Indospheric and Sinospheric practices and traditions are simultaneously present. Linguistically, a "buffer zone" is a zone of deviation from a typological profile that otherwise consistently marks a larger area, or, languages that represent "a hybridization of the two opposite patterns of their neighbors in either direction" (Stilo 2005: 38). Matisoff (1999), while not explicitly postulating a typological "buffer zone", indicates that the tonal profiles of ST languages are divergent enough to be considered in areal as well as genealogical perspective. While some prosodic properties, like overall phonological coherence of inflectional morphemes, do not significantly distinguish buffer zone languages from Indospheric and Sinospheric, others do (e.g., the presence/absence of tone and individual formative phonological dependencies) (Bickel and Hildebrandt 2005). Geographically, buffer zone languages are also hybrid, being largely contained within the Tibetan Plateau, but stretching in some cases east of the Brahmaputra River (e.g., Dege Tibetan). These languages are represented by circle symbols (●) in Map 2.

It should be noted that the spheric sub-divisions and the location of individual languages within specific zones are not unproblematic, particularly for languages like Garo and Meithei, which geographically straddle the Brahmaputra area or are located along the Himalayan spine. With these

three proposed spheres in mind, I investigate two questions: First, does the nature/type of tone system significantly identify the sampled languages as members of these three spheres? Second, does the contrastive TBU significantly identify the sampled languages as sphere members?

3.1. Tone types

The first study concerns the nature of tone systems in the sample. The tone systems here are divided into three types, described in Table 7.[9]

The findings of a cross-tabulation testing whether the hypothesized categories are significant indicators of different spheres are shown in Figure 4.

Table 7. Tone system types (languages)

No tone	The languages are a-tonal	Dolakha Newar, Garo,[a] Kinnauri, Limbu, Qiang
Amalgam	For at least half of the tones, the phonetic correlates include F_0 *and* phonation differences. The number of contrastive tones is often four or fewer	Burmese,[b] Dege Tibetan, Kham, Kyirong Tibetan, Manange
Pure	Tone is (almost) entirely a function of F_0 distinctions. If there is an additional parameter, it applies to only one tone. The number of tones is often greater than four	Cantonese, Dulong, Eastern Kayah Li, Lahu, Mandarin, Meithei, Wu

[a] Burling (1992) notes that while Garo is a-tonal, an interaction between word-final glottal stop and echo vowel insertion makes it reminiscent of other, tonal Sino-Tibetan languages.

[b] Note the Burmese tone typing here as "amalgam" because vowel phonation is an important phonetic correlate, and Eastern Kayah Li as "pure", even though two tones show creaky phonation. Even if these languages were re-coded, the distinctions would still be significant at the $p < .05$ level.

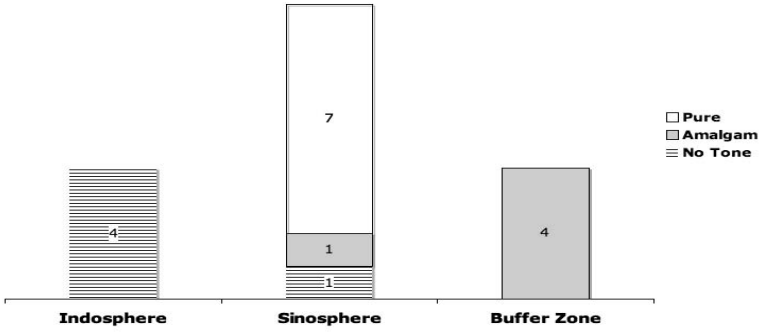


Figure 4. Tone system types across proposed spheres

The three zones are (significantly) distinct; Indospheric languages are a-tonal, buffer zone languages have amalgam systems; Sinospheric languages have mainly pure tone systems, with one case of amalgam tone (Burmese) and one case of no tone (Qiang).[10]

3.2. Tone domains

The second study investigates whether the word-level TBU significantly distinguishes buffer zone languages from the other spheres. With the same sphere, the TBU-types are subdivided into three types in Table 8.

Table 8. TBU types (languages)

No Tone	The language is a-tonal	Dolakha Newar, Garo, Kinnauri, Limbu, Qiang
Syllable	The TBU is purely prosodic. This also includes 'sesquisyllabic' languages, where the TBU is a full syllable and a reduced (/ə/) syllable	Burmese, Cantonese, Dulong, Eastern Kayah Li, Lahu, Mandarin, Wu
Word	The TBU references a unit defined both prosodically and morphologically	D. Tibetan, Kham, K. Tibetan, Manange, Meithei

The findings from a second cross-tabulation are shown in Figure 5.

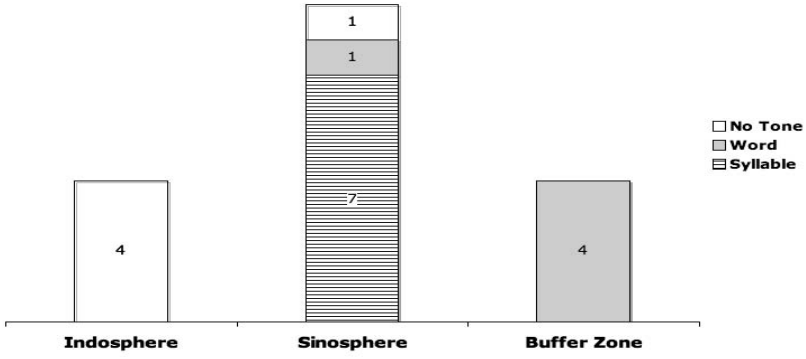


Figure 5. Tone domains across proposed spheres

Figure 5 shows that the P-word is the TBU for all buffer zone languages, and that the syllable is the TBU for most Sinospheric languages (except for Qiang, which is a-tonal, and Meithei, which has word-tone.[11]

3.3. Implications

The findings from these surveys indicate that Bodish languages (and Kham) are characterized by hybrid prosodic properties akin to related languages towards the west (Indosphere) and also towards the east (Sinosphere). Namely, they are tonal, but the correlates include syllable structure and segment phonation, and the domains reference morphological structure. In this way buffer zone languages begin to resemble Indospheric ST and Indo-European languages of the area. These findings are also reminiscent of phenomena observed in the Indo-European and Finno-Ugric languages of the Circum-Baltic "border zone", with stress patterns and polytonicity generally unattested in other European languages (Koptjevskaja-Tamm 2006: 185; Koptjevskaja-Tamm and Wälchli 2001). These findings also underscore the necessity of including Bodish languages in phonological typologies when considered in light of previous accounts, which include only Chinese as the Sino-Tibetan exemplar (e.g., Duanmu 2004) or else focus on (prosodic only) rhyme structures (e.g., Gordon 2001).

4. Sociolinguistic variables

The previous sections have shown that both the nature and the domain for tonal contrasts in Bodish languages situate them in a typologically distinct position within ST, necessitating their inclusion in tonal typologies. However, the task of detailing the correlates even within a relatively small subgrouping like Bodish is challenging, due to extralinguistic variables like language contact (inter- and intra-family), gender, and education.

While these variables complicate the typologizing of Bodish tone, these details are still necessary in order to capture the facts that contribute to their properties and the typological proposals. In this section I again provide a survey of studies of such socio-cultural factors.

4.1. Tone and gender in Tamang

Mazaudon (1973: 82) notes that the breathy vowel quality characteristic of two of the Tamang tones is easier to perceive in males' speech than in females'. For the same elicited words, there is a robust breathiness present in the male speech, and this breathiness is replaced by a less salient form of onset aspiration for females. This makes morpheme differentiation across tones difficult, as the functional load for vowel phonation in Tamang is relatively high and plays a rather large role in lexical disambiguation. This production of tone by female Tamang speakers also parallels the system in Manange, where onset consonant aspiration plays a (secondary) role, and vowel phonation plays no role.

4.2. Gurung regional dialects, gender differences, and tonal correlates

In a survey of three Gurung dialects spoken in Lamjung and Kaski districts (Nepal), Glover and Landon (1980) found a degree of both lexical variation and sound shifts (i.e., phoneme alternations or replacements) across village speech communities. They also found that Ghanpokhara Gurung in Kaski District shows no evidence of breathy phonation on vowels, unlike what typifies the tone of other dialects. Rather breathiness has been replaced by aspiration when the word begins with a voiceless stop (e.g., other dialects *bạli* vs. Ghanpokhra *pʰali* 'foot'; other dialects *tịni* vs. Ghanpokhra *tʰina* 'sun'). In still other Kaski dialects, there is the absence of vowel

breathiness *without* the co-occurrence of voiceless aspiration (e.g., both *gri̤* and *gri* 'one' in different dialects).

Two descriptions by Wilbur (2004) and Hünlich (2006) focus on the phonetics and phonology of Gurung spoken in two villages of the Manang district (Thancok/Timang and Nace), east and north of Lamjung (henceforth Manang-Gurung). Wilbur notes that about 25% of the vocabulary between Ghachok and Manang-Gurung varieties are segmentally different. Their findings also suggest that tonal correlates in Manang-Gurung correspond more with those found in Manange than with other Gurung varieties. Hünlich observed that while there are some words with (marginally) breathy phonation on vowels (e.g., [mi̤] 'person'), most words have modal vowels, regardless of pitch-melody. In addition, one speaker's breathy vowel phonation may be realized as modal by another speaker, suggesting that phonation type is not always stable or are perhaps subject to dialectal variation as well.

Another interesting discovery is that the pitch-melody patterns from different speakers from the same community are different. Figure 6 displays lines linking mean starting, mid-point and end-point F_0 values for a set of words from the four tones, produced by a female and male Gurung speaker. Both speakers are from Nace Village, Manang, and are of approximately the same age.

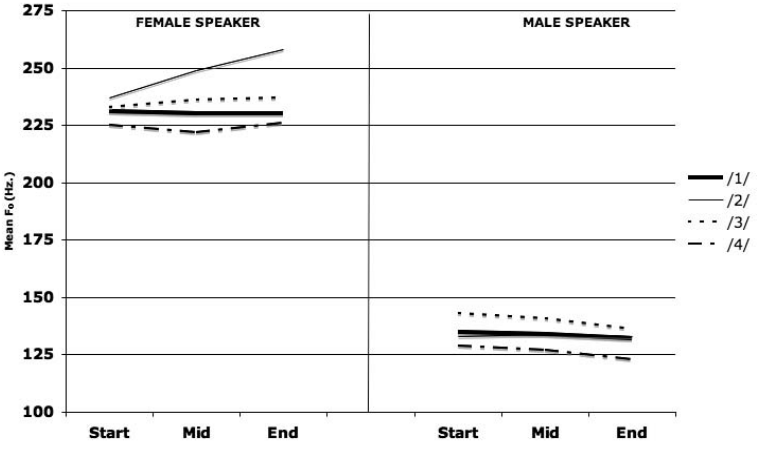


Figure 6. Mean F_0 Values, Female and Male Speakers

For the male speaker (on the right side of Figure 6), the F_0 values significantly pattern with four (level and contour) tones. The female speaker,

on the other hand, shows evidence of three tones of relatively different heights (/1/, /3/ and /4/), with one tone on a *rising* trajectory through time (/2/). This difference between gender is reminiscent of observations by Mazaudon about male and female Tamang speakers, but it is different from what is found for male and female Manange speakers. Also interesting is that, despite the phonetic (acoustic) differences between the two speakers, the female perceives male's words as identical to hers; in an intelligibility test comprised of tonal minimal sets produced in a context-free setting by the male speaker, she accurately identified the different meanings.

It should be noted that Hünlich has observed that even though the F_0 properties of words from Manang-Gurung speakers are qualitatively in line with the four-way distinction in Tamangic languages, there is enough F_0 variation across speakers from different villages that the patterns are not significantly coherent to the degree that they are for Manange. As such, more acoustic and perceptual investigations are necessary across the Manang-Gurung communities before a definitive statement about tone in this variety of the language can be made.

4.3. Language contact, language use and tone in Urban Manange

A recent study on cross-speaker phonetic and phonological tone patterns was performed with speakers from two Manange communities in Nepal (Hildebrandt 2003). One community is the traditional rural area of Manang. The other community is located in Kathmandu. In recent generations, it has become commonplace for many Mananges to migrate temporarily or permanently to the Kathmandu valley, or to lower elevations within Manang during winter, where Nepali (Indo-European) is spoken. (cf. Rogers 2004 for a historical-economic study of Manange society).

The study concerns the phonetics of tone in two Manange populations: *Rural* speakers, who were born or raised in Manang, had little or no formal education, and who used Manange on a regular, basis, and *Urban* speakers, who were born or raised in Kathmandu, who had extensive formal education, and who used Manange in more restricted and interrupted settings alongside Nepali.

The findings indicate that Urban speakers show a large-scale phonetic merger of the four tones into a two-way (high-low) opposition. In addition, the conceptualization and grouping of words into different melody groups is considerably fuzzier for them than for Rural Mananges. The F_0 plots in Figures 7 and 8 illustrate this difference across the groups.

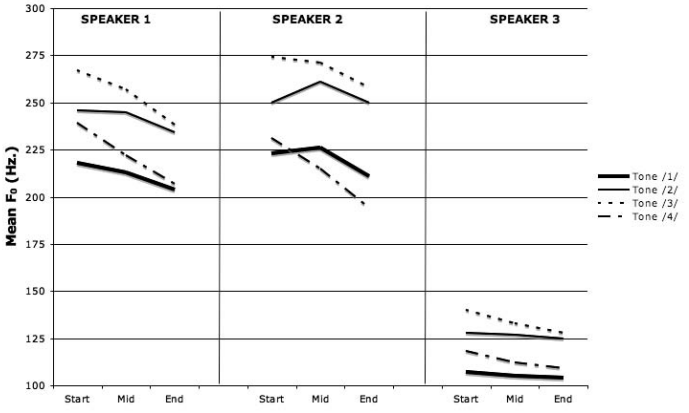


Figure 7. Mean F_0 values, three rural speakers

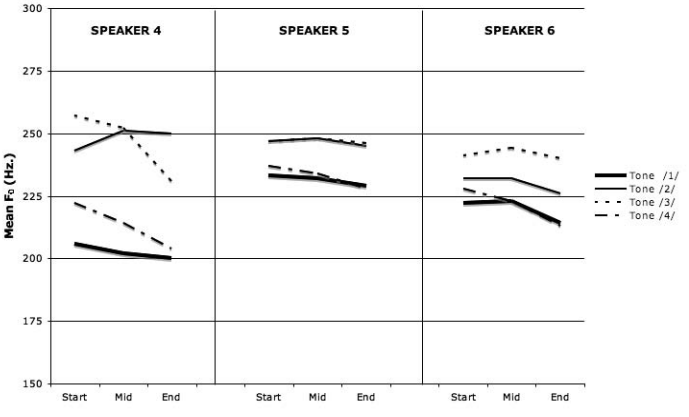


Figure 8. F_0 values three Urban speakers

In Figure 7, the data are in line with the four-way system documented for Manange (Mazaudon 1973; Hildebrandt 2003, 2004, 2005). In Figure 8, data from two of three Urban speakers of the same age group show that the same representative words display significant phonetic overlap; for two of these three speakers there is evidence for only two or three distinct pitch groupings, not four.[12] Data from Speaker 4 in Figure 8 show patterns more reminiscent of the Rural speakers. Speaker 4 is also different from the other two Urban speakers in that she had no formal education and uses Manange regularly in all domains in Kathmandu.

It is not obvious that the altered tone system for Urban speakers is simply one symptom of gradual language loss (i.e., shift to Nepali) in the Kathmandu community. For many Urban Mananges, the language is maintained in a situation of diglossia, used mainly in domestic, private environments, while Nepali is the language of necessity in public domains. Nevertheless, this structural result appears to be a consequence of such a maintenance scenario.

It is also not obvious that Urban Manange is borrowing anything from Nepali phonology. There is no evidence that Urban Mananges are incorporating the four-way Nepali obstruent onset voicing into their production. Rather, Hildebrandt (2003) argues that lexical frequency may play a role in determining which words evidence phonetic pitch merger and in determining the pitch properties of the emergent system.

Aside from these accounts, there is a rather disheartening lack of available information on dialectal differences across the different Bodish language speaker communities. This is especially troubling given the growing pace of language replacement in Nepal. These studies do suggest, however, that the phonological properties of a language should not be thought of as purely static in nature (synchronically and diachronically), or isolated from extra-linguistic (socio-cultural) factors.

5. Conclusions, remaining questions and future directions

In this paper I have demonstrated that the nature of tone in Bodish languages (and beyond) identifies these as of special typological interest. In addition, the complex cross-speaker and cross-community correlates to tone in select Bodish languages indicate that sociolinguistic variables must be further taken into account in any satisfactory and comprehensive analysis of tone in these languages.

Ultimately, this account raises more questions than it answers. For example: What other aspects of phonology (aside from tone) in these languages reveal the P-word as a valid prosodic domain? Is it valid to assume that Sinospheric languages have little evidence for prosodic domains beyond the syllable and/or foot? How do tone correlates vary across other TB language speech communities? In addition, how is tone *perceived* across these speech communities? These and other questions remain open topics for ongoing and future investigations. Given current scenarios of language shift, maintenance and change, the present time is crucial to attempt answers to these questions.

Notes

1. This study was supported by different funds: A National Science Foundation Grant BNS 9729005, funding from the University of California, and funding from the German DFG grant BI 799/2. I wish to thank the volume editors Bernhard Wälchli and Matti Miestamo and two anonymous reviewers for their comments, and also the members of the Manange and Manang-Gurung communities for their ongoing assistance with my study of their languages. Any errors are my own. Abbreviations: INDEF Indefinite, LOC Locative, PTCL Particle, TOP Topic.
2. Words without a diacritic carry a mid-level tone.
3. The diacritics in Table 1 are slightly different from those used by Huber, but the facts about the tone system remain the same.
4. All maps here are generated via the Interactive Reference Tool (WALS).
5. There is often a slight falling or rise-fall pitch effect on the grammatical suffixes of bimorphemic verb roots for all tones. In disyllabics, it is more level, with a rise-fall tendency on the second syllable.
6. In some Bodish languages (e.g., Kyirong, Sherpa), prefixes are excluded from the word-level tone domain. They are toneless and do not pick up the F_0 properties of the stem. Prefixes as non-cohering to the larger P-Word are found in other languages like Hungarian and German (cf. Hall 1999).
7. The Tani branch is not represented here, due to lack of available data.
8. Another motivation for including these languages here is because exhaustive prosodic data are currently available through the (Phonological) Word Domains component of the *Autotyp Project* (<www.uni-leipzig.de/~autotyp>).
9. This study is also inspired by Maddieson (2005), who surveyed tone types across 526 languages, with slightly different terminology and definitions.
10. Fisher's Exact value = .001, with a value of < .05 achieving significance
11. Fisher's Exact value = .001, with a value of < .05 achieving significance
12. Significance (p. < .05) achieved via an ANOVA of mean starting, mid-point and ending F_0 values for 400 words elicited in frame-medial context.

References

Bauer, Robert S., and Stephen Matthews
2003 Cantonese. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 146–155. London: Curzon Press.

Bickel, Balthasar, and Kristine A. Hildebrandt
2005 Diversity in phonological word domains. Presentation at the 2005 Association for Linguistic Typology biannual meeting. <http://www.-uni-leipzig.de/~autotyp/projects/wd_dom/wd_dom.html>

Bickel, Balthasar, and Johanna Nichols
2003 Typological enclaves. Presentation at the 2003 Association for Linguistic Typology biannual meeting. <http://www.uni-leipzig.de/-~autotyp/download/enclaves@ALT5-2003BB-JN.pdf>
Burling, Robbins
1992 Garo as a minimal tone language. *Linguistics of the Tibeto-Burman Area* 15 (5): 33–51.
2003 Garo. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 487–500. London: Curzon Press.
Chelliah, Shobhana L.
1997 *A Grammar of Meithei*. Berlin: Mouton de Gruyter.
van Driem, George
1987 *A Grammar of Limbu*. Berlin: Mouton de Gruyter.
Duanmu, San
2000 *The Phonology of Standard Chinese*. Oxford: Oxford University Press.
2004 Tone and non-tone languages: An alternative to language typology and parameters. *Language and Linguistics* 5 (4): 891–924.
Genetti, Carol
1994 *A Descriptive and Historical Account of the Dolakha Newari Dialect*. (Monumenta Serindica 24) Tokyo: Institute for the Study of Languages and Cultures of Asia and Africa.
Georg, Stefan
1996 *Marphatan Thakali*. (LINCOM Studies in Asian Linguistics 02) München/Newcastle: Lincom Europa.
Glover, Warren W.
1970 Gurung tone and higher levels. In *Occasional Papers of the Wolfenden Society on Tibeto-Burman Linguistics* iii, Austin Hale, and Kenneth I. Pike (eds.), 52–73. Urbana: University of Illinois.
Glover, Warren W., Jesse. R. Glover, and D. B. Gurung
1977 *Gurung-Nepali-English Dictionary, with English-Gurung and Nepali-Gurung Indexes*. (Pacific Linguistics Series C 51) Canberra: Australian National University.
Glover, Warren W., and A. K. Landon
1980 Gurung Dialects. *Papers in South East Asian Linguistics* 53: 29–77. (Pacific Linguistics Series A 53). Canberra: Australian National University.
Goddard, Cliff
2005 *The languages of East and Southeast Asia: An Introduction*. Oxford: Oxford University Press.
Gordon, Matthew
2001 A typology of contour tone restrictions. *Studies in Language* 25 (3): 423–462.

Green, Antony R.
2004 Word, foot, and syllable structure in Burmese. Rutgers Optimality Archive ROA 115.
Hale, Austin
1973 *Clause, Sentence and Discourse Patterns in Selected Languages of Nepal: Part IV, Word Lists*. Norman, OK: Summer Institute of Linguistics.
Hall, T. Alan
1999 The phonological word: A review. In *Studies on the Phonological Word*, T. Alan Hall, and Ursula Kleinhenz (eds.), 1–22. Amsterdam/Philadelphia: Benjamins.
Hall, T. Alan, and Kristine A. Hildebrandt
forthc. Phonological and morphological domains in Kyirong Tibetan. *Linguistics*.
Häsler, Katrin
1999 A grammar of the Tibetan Dege (Sde dge) Dialect. Ph.D. diss., Universität Bern.
Hildebrandt, Kristine A.
2003 Manange tone: Scenarios of retention and loss in two communities. Ph.D. diss., Department of Linguistics, University of California Santa Barbara.
2004 A grammar and dictionary of the Manange language. In *Tibeto-Burman Languages of Nepal: Manange and Sherpa*, Carol Genetti (ed.), 2–189. Canberra: Pacific Linguistics.
2005 A phonetic analysis of Manange segmental and suprasegmental properties. *Linguistics of the Tibeto-Burman Area* 28 (1): 1–36.
Honda, Isao
2002 Seke phonology: A comparative study of three Seke dialects. *Linguistics of the Tibeto-Burman Area* 25 (1): 191–210.
Huber, Brigitte
2002 The Lende subdialect of Kyirong Tibetan (grammar and glossary). Ph.D diss., Universität Bern.
Hünlich, David
2006 Tone in Manang Gurung: Intelligibility test and acoustic analysis. Ms.
Kelly, Barbara
2004 A grammar and glossary of the Sherpa language. In *Tibeto-Burman Languages of Nepal: Manange and Sherpa*, Carol Genetti (ed.), 193–324. Canberra: Pacific Linguistics.
Koptjevskaja-Tamm, Maria
2006 The circle that won't come full: Two potential isoglosses in the Circum-Baltic area. In *Linguistic Areas*, Yaron Matras, April

McMahon, and Nigel Vincent (eds.), 182–226. Basingstoke, U.K. and New York: Palgrave Macmillan.

Koptjevskaja-Tamm, Maria, and Bernhard Wächli

2001 The Circum-Baltic languages: An areal-typological approach. In *The Circum-Baltic Languages*, Östen Dahl, and Maria Koptjevskaja-Tamm (eds.), 615–750. Amsterdam/Philadelphia: John Benjamins.

LaPolla, Randy J.

2003 Dulong. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 674–682. London: Curzon Press.

LaPolla, Randy J., and Chenglong Huang

2003 *A Grammar of Qiang, with Annotated Texts and Glossary.* (Mouton Grammar Library 31.). Berlin: Mouton de Gruyter.

Li, Charles N, and Sandra A. Thompson

1981 *Mandarin Chinese: A Functional Reference Grammar*. Berkeley, CA: University of California Press.

Maddieson, Ian

2005 Tone. In *The World Atlas of Language Structures*, Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 58–61. Oxford, UK: Oxford University Press.

Matisoff, James A.

1973a *The Grammar of Lahu*. Berkeley, CA: University of California Press.

1973b Tonogenesis in Southeast Asia. In *Consonant Types and Tone*, Larry M. Hyman (ed.), 73–95. (Southern California Occasional Papers in Linguistics No. 1.) Los Angeles: University of Southern California.

1991 Sino-Tibetan linguistics: Present state and future prospects. *Annual Review of Anthropology* 20: 469–504.

1995 Tone, intonation and sound symbolism in Lahu: Loading the syllable canon. *Linguistics of the Tibeto-Burman Area* 12 (2): 147–163.

1999 Tibeto-Burman tonology in an areal context. In *Proceedings of the Symposium: Cross-linguistic Studies of Tonal Phenomena Tonogenesis, Typology, and Related Topics*, Shigeki Kaji (ed.), 3–32. Tokyo: Institute for the study of Languages and Cultures of Asia and Africa, Tokyo University of Foreign Studies.

2003 Lahu. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 208–220. London: Curzon Press.

Mazaudon, Martine

1973 *Phonologie tamang: Étude phonologique du dialecte tamang de Risiangku (langue tibéto-birmane du Nepal).* Paris: SELAF.

1977 Tibeto-Burman tonogenetics. *Linguistics of the Tibeto-Burman Area* 3 (2): 1–123.

1978 Consonantal mutation and tonal split in the Tamang sub-family of Tibeto-Burman. *Kailash* 7 (3): 157–179.

Noonan, Michael
2003 Nar-Phu. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 336–352. London: Curzon Press.
Rogers, Clint
2004 *Secrets of Manang*. Kathmandu, Nepal: Mandala Publications.
Sharma, D. D.
1988 *A Descriptive Grammar of Kinnauri*. Delhi: Mittal.
Solnit, David
1997 *Eastern Kayah Li: Grammar, Texts, Glossary*. Honolulu: University of Hawaii Press.
Sprigg, R. K.
1997 A tonal analysis of Gurung, with separate systems for register and contour pitch features. Bulletin of the Society for Oriental and African Studies 60 (3): 448–454.
Stilo, Donald L.
2005 Iranian as buffer zone between the universal typologies of Turkic and Semitic. In *Linguistic Convergence and Areal Diffusion: Case Studies From Iranian, Semitic and Turkic*, Éva Ágnes Csató, Bo Isaksson, and Carina Jahani (eds.), 35–64. London: Routledge Curzon.
Watters, David
2002 *A Grammar of Kham*. Cambridge: Cambridge University Press.
Watters, Stephen
1999 Tonal contrasts in Sherpa. In *Topics in Nepalese Linguistics*, Yogendra P. Yadava, and Warren W. Glover (eds.), 54–77. Kamaladi Kathmandu: Royal Nepal Academy.
2002 The sounds and tones of five Tibetan languages of the Himalayan region. *Linguistics of the Tibeto-Burman Area* 25 (1): 1–66.
Wilbur, Joshua
2004 Observations on varieties of Gurung spoken in the Gyalsumdo cultural sphere of Manang. Paper given at the 25th Annual Linguistic Society of Nepal Meeting, Kathmandu Nepal.
Yip, Moira
2002 *Tone*. Cambridge: Cambridge University Press.
Zee, Eric, and Liejiong Xu
2003 Shanghai. In *The Sino-Tibetan Languages*, Graham Thurgood, and Randy J. LaPolla (eds.), 131–145. London: Curzon Press.

Part II. Morphology, the lexicon, and the structure of words

Rembarrnga polysynthesis in cross-linguistic perspective

Adam Saulwick

1. Introduction

At least since the period of classical morphological typology, specific clusters of properties have been claimed as identifying "polysynthetic" as a distinct type from less synthetic languages (Whitney 1867: 348–354; Humboldt 1988: 128–130), but the precise nature of this difference continues to be the subject of ongoing debate. When we look at particular polysynthetic languages, clearly we are confronted with elaborate morphological structures where the verbal word can be encoded with information about such things as core actants, temporal and adverbial modifiers, and valence-changers which are frequently independent of external material.[1]

Various studies have proposed crucial properties of the polysynthetic type in terms of word unity (Boas 1911: 75), morphological synthesis (Finck 1910), obligatoriness of representation through bound material (Drossard 1996) or morphological representation of arguments on their head (Baker 1996: 14). A characteristic of some analyses has been an inordinate focus on the phenomenon of nominal incorporation as a crucial identifying property (Whitney 1867: 348; Finck 1910). However, detailed descriptions of individual polysynthetic languages have shown great diversity in particular (sets of) properties. For example, on the basis of the absence of nominal incorporation in languages such as Athapaskan,[2] West Greenlandic, Haida and Tlingit, Boas (1911: 75) rightly pointed out that nominal incorporation should not be considered a defining property of polysynthesis, see (1) for West Greenlandic.[3]

(1) West Greenlandic (Eskimo-Aleut; Boas 1911: 74)
Takusar-iartor-uma-galuar-ner-pâ?
look.after.it-go.to-intend.to-do.so-do.you.think.he-3.INTROG
'Do you think he really intends to go to look after it?'

The broad aim of this paper is to give a brief bird's-eye survey of the polysynthetic verbal word in Rembarrnga, exemplifying in some detail those features that are cross-linguistically significant for this somewhat lesser-known Australian language and thereby counter some claims that particular properties of polysynthesis are necessary, while others impossible.

The issue of what to recognize as a property of polysynthesis is complex and typically involves a number of interrelated factors, including the obligatoriness of certain properties (i.e., bound pronominal argument affixes), degree of fusion, and extent of morphological accumulation. The oft-cited example of Nahuatl, where a noun obligatorily combines with a verb stem (and when the noun is not present, a special indefinite pronoun must combine with a verb, as in [2]), obviously represents a language-specific idiosyncrasy rather than a universal property of polysynthesis.

(2) Classical Nahuatl (Uto-Aztecan, Aztecan; Humboldt 1988: 130)
a. *ni-**naca**-qua*
1S-meat-eat
'I eat meat.'
b. *ni-**c**-qua* *in* ***nacatl***
1S-3O-eat the meat
'I eat it, the meat.'

In contrast, Drossard (1996: 252–255) points out that, on the basis of Swanton's (1911: 205–282) description of Haida in which pronominals are not bound to the verbal word (3) compared with Coast Tsimshian (4), at least two types of polysynthesis should be identified.

(3) Haida (Haida; Swanton 1911: 277)
L! *Lu-is-*ʟ*!xa-gí'l-g*ᴀ*n*
they by.canoe-come-motion.toward-landward-PRET
'They came shoreward by canoe'

(4) Coast Tsimshian (Penutian, Tsimshianic; Boas 1911: 74)
*T-yuk-ligi-lo-d'*ᴇ*p-dā*ʟ*-*ᴇ*t*
he-begin-somewhere-in-down-put.down-it
'He began to put it down somewhere inside.'

Although there are apparent structural similarities between genetically unrelated languages, such as the incorporation of the (direct) object in Mohawk, Nahuatl and Bininj Gun-Wok (Australian, Gunwinyguan),[4] in (5)–(7) respectively (see also examples of structural similarities between Bininj Gun-Wok and Cayuga in Evans and Sasse 2002: 2), significant interfamilial differences should be understood language-internally prior to their use as instruments of cross-linguistic comparison. Compare for instance Bininj Gun-Wok which (except for the aberrant behaviour of the incorporated *yau* 'baby' and some exceptional constructions, see Evans 2003: 473) cannot incorporate nominals referring to animates, whereas these are possible in Rembarrnga, as in (8).[5] Moreover, Bininj Gun-Wok may incorporate two nominals each instantiating different thematic roles or grammatical relations, as in *gorrk* 'clothes' and *yau* 'child' in (7), but (aside from incorporated secondary predicates, see Section 3.6) Rembarrnga can only incorporate one (compound) nominal in a single thematic role.

(5) Mohawk (Iroquoian; Baker 1996: 22, ex. 20)
T-a-shako-wír-u-'.
CIS-FACT-M.SG.S>F.SG.O-baby-give-PUNC
'He handed her the baby.'

(6) Nahuatl (Uto-Aztecan, Aztecan; Merlan 1976: 184–185)
ni-mic-tomi-maka
1SG.S-2SG.O-money-give
'I'll give you money.'

(7) Bininj Gun-Wok, Gun-djeihmi dialect (Australian, Gunwinyguan; Evans 2003: 474, ex. 10.348)
Aban-gorrk-yau-wo-ng.
1>3PL-clothes-child-give-PP
'I gave the babies clothes.'

(8) Rembarrnga (Australian, Gunwinyguan)
Ngan-ba-dingh-dehwa.
3>1-UAUG-wife-give.PP[6]
'They gave me a wife.' (S1-3a-004)

Given the great diversity of complex morphological structure in the verbal word of polysynthetic languages, what do cross-linguistic comparisons

of these morphosyntactic constructions tell us? Sapir (1949: 121–122) provided a sober, cautionary note:

> Strictly speaking, … it is impossible to set up a limited number of types that would do full justice to the peculiarities of the thousands of languages … Even if we operate within a minutely subdivided scale of types, we may be quite certain that many of our languages will need trimming before they fit. To get them into the scheme at all it will be necessary to overestimate the significance of this or that feature or to ignore, for the time being, certain contradictions in their mechanism. Does the difficulty of classification prove the uselessness of the task? I do not think so. … In assuming the existence of comparable types, therefore, we are not gainsaying the individuality of all historical processes; we are merely affirming that back of the face of history are powerful drifts that move language … to balanced patterns, in other words, to types.

The type of polysynthesis described here is somewhat distinct from those more well-known types observed in other parts of the world (such as northern and Meso-America or north-eastern Siberia). For instance, the varieties found in northern Australia appear to draw upon a pool of areal traits – including not only nominal and adverbial incorporation found in Arnhem Land, northern Australia, but also compound verb constructions found in many northern and central Australian languages (McGregor 2002: 25, 101–147)[7] or serial verb constructions found throughout the Austro-Pacific region, for example in Yimas (Papuan) (Foley 1991: 321–336) – combining them in a way that is not the same as those typically combined in some notional, universally standard polysynthetic pattern. Nonetheless it clearly attests extreme morphological concatenation.

The extent to which apparent clusters of polysynthetic properties reflect a particular theory-driven analytical purview or a coherent constellation of properties drawn together by either morphosyntactic or functional constraints will not be addressed here. As Evans and Sasse (2002: 4) point out, until sufficient data is presented from a broad sample of languages attesting polysynthetic features, it will not be possible to ascertain whether a particular set of properties is typologically relevant or definitionally circular.

We have already seen above that "typical" polysynthetic features, such as obligatory pronominal and TAM affixation, or nominal and adverbial incorporation have been presented as more or less iconic of the type, though not without criticism. This paper will show that these are indeed typical features of the Rembarrnga verbal word. In addition, however, it

will show some typologically distinct features, some of which appear to attest areal influences while others are perhaps attributable to internal innovation. First, Rembarrnga (and some other neighbouring polysynthetic languages) exhibits verb incorporation (Section 3.6); a typologically uncommon feature of polysynthesis. Although no current generally acknowledged genetic relation exists between the Gunwinyguan family and languages beyond Australia to the north,[8] the Asia-Pacific region is well known for the prevalence of productive verb serialization. Second, compared to other Gunwinyguan languages, Rembarrnga attests two rather elaborated properties: alienable incorporation (Section 3.5) and the typologically rare polysynthetic infinitive constructions (Section 3.7). In discussing these constructions, the paper argues that theorizing over possible polysynthetic properties needs to be done on the basis of thorough empirically based descriptive work; for surely this underpins good typology. Moreover, it is claimed that there is value in providing a micro-typology of interfamilial differences, because these differences aid the typologist in developing a more nuanced appreciation of (cross-)linguistic facts.

The structure of this paper is as follows. Section 2 provides a necessary overview of the properties of the Rembarrnga verbal word. Section 3 exemplifies specific properties presented in Section 2 and focuses on three properties of particular interest for polysynthetic languages, namely (i) the inter-Gunwinyguan uncommon property of alienable nominal incorporation, (ii) verb incorporation, and (iii) the cross-linguistically rare polysynthetic infinitive constructions. Section 4 concludes with a summary and comments.

2. Rembarrnga polysynthesis

Rembarrnga is a highly endangered, non-Pama-Nyungan, Gunwinyguan language of northern Australia. Detailed grammatical descriptions of Rembarrnga are McKay (1975) and Saulwick (2003, see also references therein).

The broad features of Rembarrnga verbal morphology are fairly typical of a Gunwinyguan language. It attests, though not necessarily all simultaneously, bound pronominal argument prefixes for up to two actants, e.g., subject and object; incorporated nominals (henceforth IN) and adverbials; lexicalized N-V compounding; root reduplication; valence-changing affixes; and suffixes for reflexive/reciprocal diathesis, tense/aspect/mood

values, and for a relatively limited range of cases. The verbal words in (9)–(10) exemplify a number of these properties.

(9) *Dan-bak-ban-yol-yol-mœ.*
2>1-BEN-stupid.things-REDUP-tell.story-PCF
'You told them for me [about] stupid things.'
Speaker's translation: 'You should have told (them) not to do stupid things for me.' (S3-60-032d)

(10) *... barra-warna-nge-ma-ngœ-ttœ-n.*
3A-still-name-get-STM-RR-NP
'… they are still calling their own names.' (S1-131-039)

The various properties attested in Rembarrnga verbal morphology are summarized in (11).

(11) Non-exhaustive list of properties of the Rembarrnga verbal word.[9]
(i) *Holophrasis*: extreme morphological concatenation, forming isomorphism between a word and a sentence.
(ii) *Polypersonalism*: morphological integration into the verbal word of bound pronominal affixes specifying person and number of (core) actants.
(iii) *Denominal verb formation*: formation of verbal stems from nominal roots.
(iv) *Reduplication* of verb roots forming stems.
(v) *Nominal incorporation*: morphological integration of a nominal stem into the verbal word.
(vi) *Adverbial incorporation*: morphological integration of an adverbial stem into the verbal word.
(vii) *Verbal incorporation*: morphological integration of a verb stem into the verbal word in addition to its obligatory stem.
(viii) *Complementarity*: degree of semantic correlation with respect to occurrence in pronominal versus IN slots.
(ix) *Valence modification* effected through forms morphologically bound to the verb stem or within the verbal word.
(x) *Tense, aspect* and *mood* specification affixed to the verbal word.
(xi) *Infinitives*: the expression of infinitival clauses with non-finite verbs.
(xii) *Inflectional* and *derivational* processes within the one verbal word, including valence modification.

(xiii) *Subordination*: subordinate clauses effected through verbal morphology.
(xiv) *Nominal case* morphology affixing to the verbal word.
(xv) *Compositionality*: the possibility to build up the semantics of the verbal word from the sum of the morphological parts, but with common noncompositional extensions, lexicalizations and idiomatizations.

3. Exemplification of the Rembarrnga verbal word

3.1. The verbal word

As the properties outlined in (11) are claimed to pertain to polysynthetic morphology, it is first necessary to delimit their domain – the Rembarrnga verbal word. Minimally, a verbal word is comprised of a verb stem (which normally cannot occur in isolation), together with an obligatory bound pronominal argument prefix and a TAM suffix.[10] This forms a complete morphological, phonological and grammatical word, as in (12)–(13).

(12) *Barr-bu-n.*
3A>3-hit-NP
'They hit it.' (S4-124-151)

(13) *Banga-na-na.*
1>3A-see-FUT
'I will see them.' (S2-45-275)

3.2. Holophrasis

Holophrasis is an extreme degree of morphological concatenation, forming isomorphism between a word and a sentence (cf. Boas 1911: 26). The boundaries of a word can be identified through morphological, syntactic and prosodic diagnostics (not discussed here for reasons of brevity, but see Saulwick 2003: 46–54, 332–345). The holophrastic verbal words in (9)–(10) and (12)–(16) exemplify this, each representing a single word in terms of syntax, morphology and prosody. In syntactic terms, the verbal word forms a constituent which can occur in isolation or in various orders with

external material, such as NPs and modifiers, particular orders being preferred by discourse structure/information packaging requirements (Saulwick, in press). In morphological terms, it attests clear morphological boundaries (as presented in 3.1), such as bound pronominal argument prefixes and TAM or case suffixes. In prosodic terms, it forms a single intonation contour. From an information content point of view, each verbal word can express a complete (sentential) proposition, comparable to a full-blown sentence in less synthetic languages; compare, for instance, the English translations.

(14) *Yarran-mœh-manga-rdayh-ga-bœ …*
3>1A-LEST-neck-be.broken-CAUS-IRR
'It might break our necks …' (S3-46-293)

(15) *… barr-ji-bartta-ma-ngœ-gan.*
3A>3-just-DPRVT-get-PCF-DAT
'… they were just going to take it off her.' (S2-168-058)

(16) *Yarran-mœh-guhbi-bopna-ni-yuwa.*
3>1A-LEST-sweat-smell-STM-PROG.NP
'It [the kangaroo] might smell our sweat (as we try to sneak up on it).' (McKay 1975: 176, 2.5-106)

3.3. Some typical properties of polysynthesis

Polypersonalism, denominal verb formation and valence modification are common and well-described features of polysynthetic languages and, although they are complex phenomena, for reasons of brevity are treated briefly here.

Polypersonalism is the morphological integration into the verbal word of obligatory bound pronominal argument affixes for (core) actants. The term *core actants* refers to the main participants in an event, namely, a subject and possibly an object (O), whether direct or oblique. There are two sets of bound pronominal prefixes, monovalent (17) and bivalent (14)–(16).

(17) *Nginy-ro-ngara.*
2-go-FUT
'You go off.' (S4-1-030)

The selection of a mono- or bi-valent prefix is determined by the morphological transitivity of the lexical verb stem in combination with any occurring valence-changing affixes (see 3.4).

Verb stems can be derived from nominal roots (including adjectives) by suffixing either a monomorphemic verb root or a thematic formant. The current corpus has 16 denominalizing thematics in total (9 verb roots and 7 thematic formants), see Saulwick (2003: 128). For reasons of space, only one is illustrated here, *-wa*, denominal causative (DNML.CAUS). One of at least three functions of *-wa* is to denominalize nominal roots. In addition, it transitivizes and/or causativizes the denominalized predicates (it can also combine with certain verb stems). An example of the transitivizing function (in which *-wa* introduces an O to the denominalized verb) is with the nominal stem *jœrrœ* 'trouble', as in (18)–(19).

(18) *Dan-**jœrrœ-wa**.*
2>1-trouble-DNML.CAUS.NP
'You're arguing with me.' (S4-72-120)

(19) *Banba-mœh-**jœrrœ-wa**-nœ* *dakkudakku.*
3A>3A-LEST-trouble-DNML.CAUS-PSUBJ children
'In case they would fight the children.' (S3-46-103)

Evidence that *jœrrœ* is a nominal is demonstrated by its occurrence as an argument of a predicate in an external position (which bare verb stems cannot do) as in (20).

(20) ***Jœrrœ*** *ga-wutj-ja-gan.*
trouble NP.3-be.finished-FUT-DAT
'The trouble will finish.' (S2-24-025)

3.4. Valence modification

Valence-changing morphology is a common and well-known property of Gunwinyguan languages. Rembarrnga possesses a number of morphological means through with diathesis shift is effected in the verbal word. I briefly present here reflexivization, applicativization and causativization.

Valence reduction of underived verb stems is exemplified through reflexivization with the suffix *-tti/-rri*, which decreases the number of core

arguments that can be registered on the verb by a factor of one in comparison to the underived verb stem. This diathetic shift is shown by the requisite monovalent bound argument prefix in (21b) on the morphologically transitive underived verb stem *wundu* 'hide' in (21a).

(21) a. *Da-**wundi**-ya.*
2>3-hide-PP
'You hid it.' (S4-72-069)

b. *Nginy-**wundu-tti**-ny.*
2-hide(STM)-RR-PP
'You hid yourself.' (S4-92-034)

Valence increase is attested through causativization and applicativization of which the benefactive applicative *bak-* is a prime exponent of the latter. For instance, the *bak*-applicativized verb stem *bolh* 'come' has its argument frame extended and thus requires a bivalent pronominal argument prefix in (22b).

(22) a. *Yeneh-wala nginy-**bolh**-miny?*
INTROG-ABL 2-come-PP
'Where did you (singular) come from?' (S1-0-002)

b. *Gurrah dan-**bak-bolh**-la!*
that.way 2>1-BEN-come-FUT
'(You) come to me there!' (S4-109-058)

The suffix *-ga* exemplifies this for the causative, as in (23).[11]

(23) a. *… yarra-mœh-**nyarh**-mœ.*
1A-LEST-die-IRR
'…we might die.' (S3-46-294)

b. *Bi **nyarh-ga**-ba.*
Man PST.3>3.die-CAUS-PP
'A man killed her.' (Lit. 'he made her die') (S3-110-130)

These, and other similar functioning affixes (see Saulwick 2003 for discussion), are frequently exploited and highly productive properties of the verbal word morphology in Rembarrnga.

3.5. Nominal incorporation

Nominal incorporation (NI) is the morphological integration of a nominal stem into the verbal word. As stipulated in Saulwick (2003: 335) one of a number of diagnostics for identifying NI is that for an N to be considered incorporated there must be the possibility for an external agnate. That is, the same verbal word must also be able to form a construction in which the nominal can occur externally. Thus, where a nominal does not obligatorily combine with a verb stem (i.e., attests an external agnate) and adheres to the absolutive constraint (see below) – in combination with some other diagnostics (see Saulwick 2003: 328–411) – this indicates that it is incorporated,[12] compare (24)–(25).[13]

(24) (*Bim-na*) *jubul* *nga-walang-**bim-bordoh**-yimany.*
painting-REF many 1>3-SEQ-painting-put(STM)-PROG.PST
Speaker's translation: 'I was always putting lots of paintings.' (S3-60-061)

(25) ***Bim*** *nga-walang-**bordoh**-yimany.*
painting 1>3-SEQ-put(STM)-PROG.PST
'I was putting pictures all the time.' (S3-60-012)

Having established this as a criterion, agnatic doublets will not be given for each IN. Unless otherwise stated, in each case they can be assumed to be possible. Due to space restrictions I do not discuss incorporation into stative predicates, which in Gunwinyguan languages present a special case of incorporation with particular "thetic" semantics (see Evans 2003; Saulwick 2003, in press).

Within Australian languages another tendency is that if a language makes use of productive nominal incorporation, the set of participating nominals will be at least somatic and may in some cases extend to alienables (Chappell and McGregor 1996). NI in Rembarrnga allows productive incorporation of inalienable nominals, such as somatic nominals (cf. also Bach 1993), i.e., body parts (26)–(27) and bodily excretions (28) and expressions (29).

(26) *Yarra-ppah-**langœ**-ngarr-miny.*
1A-UAUG-hand-sick-PP
'Both our hands got sore.' (S2-83-022)

(27) *Nga-**jarra**-batjja.*
1>3-head-hit.NP
a. 'I hit its head.' / b. 'I hit it on the head.' (S1-114-043)

(28) *... malak nin-ji-**guhbi**-bopna-na.*
NEG SUBR.3>2-just-sweat-smell-FUT
'… it just won't smell your sweat.' (S1-75-009)

(29) *Da-**yang**-ngeja-ngeja.*
2>3-language-REDUP-tell.about.NP
'You were telling (me) his words, what he said.' (S4-72-098)

Although speakers will accept an external agnate of the expressions in (26)–(29), incorporation is generally the preferred or default morphosyntactic position for somatic nominals.

In addition to somatic nominals, the domain of incorporation also extends to (what at first appear to be) alienable nominals that are in some way "connected" with the absolutive argument. Bally's notion of the personal domain (Bally [1926] 1996) is a useful concept to account for the construal of a possession relation between the INs and the absolutive argument. Personal domain items include tools and other personal effects found in the domestic sphere and hence typically associated with human controllers, as in (30)–(32).

(30) *Nginy-**gœrh**-wina-tti-ny.*
2-stone.knife-lose(STM)-RR-PP
'You lost your stone knife.' (S4-26c-111)

(31) *Ngan-**bordi**-gik-miny.*
3>1-spear-mouth.spray.ochre-PP
'He sprayed my spear in ochre from his mouth.' (S2-68-019)

(32) *Nga-**gok**-rdulh-miny.*
1-house-catch.fire-PP
'My house caught fire.' (S2-24-021)

Kin-terms may also be incorporated, as in (33), and this can be understood as a related phenomenon to the notion of the personal domain and in

terms of what Seiler (2001) describes as inherent possession, see Saulwick (2003: 405–411) for further discussion.

(33) *Nga-**ngala**-na.*
1>3-mother-see.PP
'I saw the little boy's mother.' (S4-92-078)

A distinct and rather unusual aspect of NI in Rembarrnga in comparison to other Gunwinyguan languages is that not only may personal domain nominals be incorporated but also alienables beyond the personal domain, both inanimate (34)–(35) and non-human animates (36).

(34) *Nganba-**marrmo**-dehwa.*
3A>1-country-give.PP
'They gave me country.' (i.e., some land to live on) (S1-3a-008b)

(35) *Mœlak yanahgurn yarr-**borloh**-rdetj-miny…*
NEG no.one 1A>3-tree-cut-PP
'No-one (of us), we didn't cut the tree…' (S3-46-265)

(36) *"Nga-yi-**wurrpparn**-marninyh-mœ-ttœ-na," yi-niny.*
1-REP-emu-make-STM-RR-FUT PT.3.say-PP
'"I will turn myself into an emu", she said.' (S2-168-086)

Finally, in addition, given contextual, cultural or long-standing associations, any alienable INs may also be construed as possessed by the absolutive argument, as in (37).

(37) *Ga-**ngarlwart**-yu-ru.*
3-stone-lie.LOC-NP
'There's his stone (but [we] can't see him).' (McKay, field-notes, R-49-9)

Other Gunwinyguan languages, such as Ngalakgan (Merlan 1983), Warray (Harvey 1986, 1996) and Bininj Gun-Wok (Evans 2003, §8.1.3.4) neither permit incorporation of such an extensive range of nominals nor the semantic interpretation outlined here.

I have argued elsewhere (Saulwick 2003, 2006, in press) for a unified explanation of the semantic interpretation on INs based on their animacy and ontology. I have described here a class of INs with graded category membership, with body part INs at the centre and a range of other Ns, such

as part nominals, bodily emissions and expressions, abstract nominals, qualities, attributes and associations, and kin terms that are all typically associated with an entity and hence construed either in a part–whole relation or in a relation of possession or association between the IN and the absolutive argument registered by the pronominal argument prefix.

It is appropriate to divide INs into three subclasses based on their variable semantic interpretation when incorporated. Basically, the default construal of incorporated body parts is as an affected part of an affected whole absolutive argument. The same interpretation is also common with non-body part nominals but depends on the speaker's depiction of the nominal, i.e., whether it is conceived of as associated with the whole or disassociated from it. Related to the class of body parts are nominals that are not strictly body parts, but are inherently associated with the body as bodily emissions and expressions. These nominals cannot typically be disassociated from a person as their creator. When incorporated their default interpretation is as possessum of the absolutive argument. Another class of nominals that cannot be disassociated from an individual are kin terms (a reflection of their inherent lexical semantics) and so these also receive a possessed interpretation when incorporated. Nominals found within the personal domain, such as tools or an abode and the results of hunting and gathering expeditions are also typically construed as possessed when incorporated. Finally, nominals not inherently associated with an entity through their lexical semantics, may nevertheless be linked with an entity by cultural belief or by some other type of incidental association. When such an association is in place, when incorporated these nominals will also be construed as the possessum of the absolutive argument. The semantic interpretation continuum schematized in Figure 1 identifies a direct relation between the default interpretation of INs (i.e., part–whole, possessive, and associative) based on their type.

Incorporated Nominal type		Default interpretation
body parts	↔	part–whole
parts	↑	|
bodily emissions, expressions, qualities	|	|
kin terms	|	|
personal effects	|	possessed
abstract Ns	↓	|
alienable entities	↔	non-possessed (association required)

Figure 1. Semantic construal based on the ontology of an Incorporated Nominal

Typologically, productive morphosyntactic NI is often described as classificatory, delimiting the scope of the host verb (Mithun 1984). However a classificatory function to NI is not clearly established as a common or predominant function in Rembarrnga (see Saulwick 2003: 383).

3.6. Verbal incorporation

Verbal incorporation is the morphological integration of a verb stem into the verbal word already comprising the obligatory verb stem. Current Rembarrnga attests this with somewhat less productivity than it does NI. Two examples of verb incorporation are (38)–(39). In a comparable diagnostic to the agnate test for NI described in Section 3.4, each of these verb stems can also occur as the sole verb stem in a verbal word. For instance, the (a) and (b) examples below show each verb functioning as the only verb stem in the verbal word. The (c) examples exemplify verb incorporation: *marninyh* 'make' into *ro* 'go' (38c) and *ngeh* 'get up' into *yœrrœkga* 'remove' (39c).

(38) a. *Manga-na-gan strap yarr-**marninyh**-mœrn.*
neck-3.POSS-DAT strap 1A>3-make-PHAB
'We used to make straps for their necks.' (S1-70-018)

b. *Barrppuh yarra-**ro**-ngara*
after 1A-go-FUT
'After we will go.' (S3-46-166)

c. *… yarr-**marninyh-ro-**nginy-gappul jila-yih.*
1A>3-make-go-PCONT-A axe-INST
'We were all **making** it (the airstrip) with axes while **going** along…' (S2-102-024)

(39) a. *Nga-**ngeh**-ra.*
1-get.up-FUT
'I'll get up.' (S2-8-095)

b. *… nga-**yœrrœkga**-ba ngurah-wala.*
1>3-remove-PP fire-ABL
'… I took it out of the fire.' (S1-83c-007)

c. *... nga-walang-**ngeh-yœrrœkga**-ra ...*
1>3-SEQ-get.up-remove-FUT
'… I will then **get up** and **remove** it…' (S1-114-025)

Further evidence that the left-most verb stem is incorporated into the right-most one is observed through the fact that the selection of the class of TAM inflection is determined by the conjugation class of the right-most verb stem. For instance, when forming associated motion constructions, as in (38c), the past continuous form of the inflection for *ro* 'go' is *-nginy* whereas the past continuous inflection for *marninyh* 'make' is *-mœrn*, see McKay (1975: 131–135) and Saulwick (2003: 196–197) for detailed discussion of conjugation paradigms.

There are morphological repercussions of verb incorporation on the whole polysynthetic structure. The selection of a mono- or bivalent pronominal argument prefix is determined by the transitivity of the combined verb stems. For instance, although *ro* 'go' is intransitive, (38b), when incorporating the transitive *marninyh* 'make', the complex stem *marninyh-ro* requires a bivalent pronominal prefix *yarr-* (1A>3) instead of the normal monovalent form *yarra-*, compare (38a and c). Thus, the higher transitivity value of one of the component verb stems determines the valency selection of the pronominal prefix. The functions of verb incorporation include a range of associated motion (38c) and (40)–(41), and serial verb constructions (39c) and (42).

(40) *ngawa re ga-**nyawk-yi**-ya.*
PST.3>3.hear.PP animal[NOM] NP.3-speak-go-PP
'He heard the animals talking/chattering as they went.' (McKay, 1975: 176, 2.5-105)

(41) *Nga-ngunu-**ngu**-ni-**yongara**.*
1>3-REDUP-eat-STM-PROG.FUT
'I'll eat it while walking.' (McKay, field-notes-R-57-4)

(42) *Barra-many mowut-**mowut**-**wutj**-miny …*
3A-went PST.3.REDUP-hop.of.macropodidae-be.finished-PP
'They went, they hopped until they were run out …' (S2-145-072)

The possibility to incorporate verb stems is typologically significant and may represent areal influence from other Australian languages with complex verb constructions to the south or verb serializing languages to the north.[14] This suggests another diachronic pathway to polysynthesis. Thus, it seems that once a language has opted for the fundamental genius of ex-

treme morphological concatenation, neighbouring structural phenomena may be co-opted (see Chafe 2000).

3.7. TAM specification and infinitives

In spite of claims that non-finite clauses should be impossible in polysynthetic languages (Baker 1996: 452), Nordlinger and Saulwick (2002) have shown that Rembarrnga attests two infinitival constructions, one with and one without pronominal agreement morphology, as exemplified in (43) and (44) respectively.

(43) *Nginy-waralh-miny guwa* ***nginy-ro-ngœ****.*
1>2-ask-PP PURP 2-go-INF
'I asked you to go.' (S4-1-014)

(44) *Mala galitj yarr-nœtti-ny mahgun* ***ma-ngœ-gan***
all other 1A>3-keep-PCONT again get-INF-DAT
'We used to keep the other half (of bullock coaches) again to get more, (while the others used to go back to the station.)' (S1-70-008)

Infinitive forms are identified on inflectional and semantic/pragmatic grounds. The infinitive inflection is in paradigmatic contrast with "standard" finite tense, aspect and mood values, compare the forms given in Table 1 (from Nordlinger and Saulwick 2002: 189) against the inflections in (43)–(44).

Table 1. Partial verb conjugation paradigm

Class	present	future	past punctual	past continuous	irrealis	infinitive
1	*ø*	*-Ca*	*-miny*	*-mœrn*	*-mœ*	*ø*
2	*-nœh*	*-nhna*	*-niny*	*-nœhmœrn*	*-nœhmœ*	*-nœh*
3	*-ra*	*-ra*	*-ba*	*-bœrn*	*-bœ*	*-bœ*
4	*-n*	*-na*	*-nginy* $_{+}$	*-niny*	*-nœ*	*-nœ*
5	*ø*	*-ngara*	*-ya* $_{+}$	*-nginy* $_{+}$	*-ngœ*	*-ngœ*

Note to *Table 1*: Forms marked with the subscript '$_{+}$' actually have a number of allomorphs, of which only the most common are given here. For a more extensive paradigm see McKay (1975: 132) and Saulwick (2003: 194-207).

As outlined in Nordlinger and Saulwick (2002: 195), although the infinitive inflections are homophonous with other inflectional values (e.g., either the present inflection for class 1 verbs or the irrealis inflection for class 3, 4 or 5 verbs) based on the semantics/pragmatics of this suffix it can

be identified as a distinct member of the inflectional paradigm. In addition, not only have other pronominally-inflected languages such as Portuguese, Calabrian and Old Neapolitan been shown to attest an infinitive inflection (see Nordlinger and Saulwick 2002 for references), but also at least one other polysynthetic language, Chukchi (Spencer 1999: 110), has been shown to have infinitives. Other Gunwinyguan languages have not been described as attesting either of these infinitive structures.

4. Conclusion

In this brief overview of aspects of Rembarrnga verbal morphology we have seen a number of typical polysynthetic properties that cluster together, including polypersonalism, nominal and adverbial incorporation, and a range of valence-changing phenomena. In addition we have seen two typologically somewhat rarer features, incorporated verbs and infinitives. In spite of claims that these properties are either incompatible or unattested in polysynthesis, the data presented here show that not only are they attested in Rembarrnga, but that they also need to be taken into account as possible properties of the type.[15] Thus, these data constitute an appeal to include detailed description on lesser-known languages in typological theorizing. Diachronically, areal features of complex verb constructions and/or verb serialization could be seen as a possible source for verb incorporation and thus can offer a possible explanation for regional variation in the typology of polysynthesis. For, once a language has gone down the path of polysynthesis, it seems that it can marshal internal and external resources as an aid in forming and innovating multifarious morphosyntactic structures.

Notes

1. I would like to thank the editors, Matti Miestamo and Bernhard Wälchli, as well as Nick Evans and two anonymous reviewers for comments on an earlier version of this paper. I am also grateful to Dagmar Jung, Hans-Jürgen Sasse and audiences at the Institut für Linguistik, Allgemeine Sprachwissenschaft, Universität zu Köln and the Amsterdam Center for Language and Communication, Universiteit van Amsterdam for comments on some of the ideas herein. Naturally I am solely responsible for any errors of fact or interpretation. Heartfelt thanks also go the Rembarrnga people, many of whom have shared with me aspects of their language and culture. Abbreviations used in the text and in Rembarrnga glosses: 1, 2, 3 first, second and third person,

respectively, > symbolizes the "acting on undergoer" relation, A augmented, ABL ablative, BEN benefactive, CAUS causative, CIS cislocative, DAT dative, DNML denominal, DPRVT deprivative, F feminine, FACT factual, FUT future, INF infinitive affix, INST instrumental, INTROG interrogative, IRR irrealis, LEST lest, LOC locative, M masculine, NEG negative, NOM nominative, NP non-past, O "object" O-class, PCF past counterfactual, PCONT past continuous, PHAB past habitual, PL plural, POSS possessive, PP past perfective, PRET preterite, PROG progressive, PST past, PSUBJ past subjunctive, PUNC punctual, PURP purposive, REDUP reduplication, REF referential, REP reported, RR reflexive/reciprocal, S "subject" A-class, SEQ sequential, SG singular, STM stem, SUBR subordinate, UAUG unit augmented.

2. Unfortunately, there is no indication as to which Athapaskan language Boas referred to, though it may have been Hupa, as this is the Athapaskan language treated by Pliny Earle Goddard (pages 85–158) in the volume introduced by Boas and cited here.
3. Unless otherwise stated, glosses are kept as in the original cited material.
4. Although *The World Atlas of Language Structures (WALS*, Haspelmath et al., eds. 2005) writes the name of the genus as "Gunwinygic", here I adopt the well-established term Gunwinyguan.
5. Except where stated, all examples are from my own field notes, identified by S followed by a set of reference numbers in braces after the translation line.
6. Except where stated, minimal number is not represented in the gloss, whereas augmented number is represented by the addition of small capitals "A" following the numeral.
7. I do not claim that verb incorporation in Rembarrnga and other Gunwinyguan languages is the same phenomenon or has identical semantic function as the various compound verb constructions described by McGregor (2002). Rather, that from a structural perspective they are comparable in that they contain two lexical verbs.
8. See the work by Dunn et al. (2005) on structural phylogenetics in Oceanic Austronesian and their ongoing work in the northern Australian/Papua region.
9. Compare Fortescue's (1994: 2601) nine traits tending to "cluster in languages displaying polysynthetic morphology".
10. Exceptions to this are special smaller structures, such as infinitives, which may omit bound pronominal arguments and/or TAM suffixes (see §3.7).
11. The lack of an overt marker for third person minimal past is usually not represented in the vernacular line but is represented in the gloss line by the numeral 3.
12. Note that Sadock (1980, 1986: 20) finds that some forms of incorporation in Greenlandic are obligatory and so these types of tests must be based on language internal criteria.
13. The parentheses in (24) indicate that the external nominal is optional, but it is given here because it appeared in the naturally occurring example cited. External nominals in such constructions are syntactically optional, though they may be required for discourse purposes (see Saulwick, in press). Postulation of

the null stem in these examples is based on paradigmatic evidence, but not relevant here (see Saulwick 2003).

14. Verb incorporation is also attested to varying degrees in other Gunwinyguan languages, see Ngalakgan (Merlan 1983: 92, 110, 127), Warray (Harvey 1986: 125) and Bininj Gun-Wok (Evans 2003). Two anonymous reviewers have asked whether verb incorporation and prepound plus verb stem constructions in Gunwinyguan are equivalent or at least similar to complex verb constructions in other northern and central Australian languages as discussed in McGregor (2002). However, as noted by McGregor (2002: 147), this issue is far from clear and even for those well described Gunwinyguan languages opinions differ. McGregor seems to favour comparison (see McGregor 2002: 146–147), and indicates (McGregor 2002: 147) that McKay (1975), Harvey (1990) and Evans (2003) do not adopt this analysis; nor does Saulwick (2003). From a purely formal perspective, although the morphosyntactically looser compound verb constructions show some structural parallels with prepound plus thematic or incorporated verb constructions in Gunwinyguan languages, there do not appear to be clear semantics correlations.
15. Another case is that of subordination. However, space restrictions prevent a description of subordinated verbal words in Rembarrnga, for some discussion see McKay (1988) and (Saulwick, in press). See also the discussion of subordination in Dalabon (labelled Ngalkbun in *WALS*, Haspelmath et al, eds. 2005) (Evans 2006) a polysynthetic language closely related to Rembarrnga.

References

Bach, Emmon
1993 On the semantics of polysynthesis. In *Proceedings of the Nineteenth Annual Meeting of the Berkeley Linguistics Society General Session and Parasession on Semantic Typology and Semantic Universals*, Joshua S. Guenter, Barbara A. Kaiser, and Cheryl C. Zoll (eds.), 361–368. (BLS 19.) Berkeley: Berkeley Linguistics Society.

Baker, Mark C.
1996 *The Polysynthesis Parameter*. New York: Oxford University Press.

Bally, Charles
1996 Reprint. The expression of concepts of the personal domain and indivisibility in Indo-European languages. In *The Grammar of Inalienability: A Typological Perspective on Body Part Terms and the Part-Whole Relation*, Hilary Chappell, and William McGregor (eds.), 31–61. (Empirical Approaches to Language Typology 14.) Berlin/New York: Mouton de Gruyter. Originally published as L'expression des idées de sphère personnelle et de solidarité dans les langues indo-européennes, in *Festschrift Louis Gauchat*, F. Fankhauser, and J. Jud (eds.), 68–78, Aarau, 1926.

Boas, Franz
1911 Introduction. In *Handbook of American Indian Languages*, Franz Boas (ed.), 1–84. (Smithsonian Institution, Bureau of American Ethnology Bulletin 40.) Washington, DC: Government Printing Office.

Chafe, Wallace
2000 Florescence as a Force in Grammaticalization. In *Reconstructing Grammar: Comparative Linguistics and Grammaticalization*, Spike Guildea (ed.), 39–64. (Typological Studies in Language 43.) Amsterdam/Philidelphia: John Benjamins.

Chappell, Hilary, and William McGregor (eds.)
1996 *The Grammar of Inalienability: A Typological Perspective on Body Part Terms and the Part-Whole Relation*. Berlin/New York: Mouton de Gruyter.

Drossard, Werner
1996 Polysynthesis and polysynthetic languages in comparative perspective. In *Typology: Prototypes, Item Orderings and Universals, Proceedings of LP'96 (Linguistics and Phonetics)*, Bohumil Palek (ed.), 251–264. Prague: Charles University Press.

Dunn, Michael, Angela Terrill, Ger Reesink, Robert A. Foley, and Stephen C. Levinson
2005 Structural phylogenetics and the reconstruction of ancient language history. *Science* 309 (5743): 2072–2075.

Evans, Nicholas
2003 *Bininj Gun-Wok: A Pan-Dialectal Grammar of Mayali, Kunwinjku and Kune*. 2 vols. Canberra: Pacific Linguistics.
2006 Who Said Polysynthetic Languages Avoid Subordination? Multiple Subordination Strategies in Dalabon. *Australian Journal of Linguistics* 26 (1): 31–58.

Evans, Nicholas, and Hans-Jürgen Sasse
2002 Introduction: Problems of polysynthesis. In *Problems of Polysynthesis*, Nicholas Evans, and Hans-Jürgen Sasse (eds.), 1–13. (Studia typologica 4., special issue of Sprachtypologie und Universalienforschung.) Berlin: Akademie Verlag.

Finck, Franz Nikolaus
1910 *Die Haupttypen des Sprachbaus*. Leipzig: Teubner.

Foley, William A.
1991 *The Yimas Language of New Guinea*. Stanford: Stanford University Press.

Fortescue, Michael
1994 Morphology, Polysynthetic. In *The Encyclopedia of Language and Linguistics*, vol. 5, Ronald E. Asher (ed.), 2600–2602. Oxford: Pergamon Press.

Harvey, Mark
1986 Ngoni Waray amungal-yang: The Waray Language from Adelaide River. MA thesis, University of Newcastle.

1990 *Warray Grammar and Dictionary*. Sydney: University of Sydney.
1996 Body parts in Warray. In *The Grammar of Inalienability: A Typological Perspective on Body Part Terms and the Part-Whole Relation*, Hilary Chappell, and William McGregor (eds.), 111–154. Berlin/New York: Mouton de Gruyter

Haspelmath, Martin, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.)
2005 *The World Atlas of Language Structures*. Oxford: Oxford University Press.

Humboldt, Wilhelm von
1988 Reprint. *Über die Verschiedenheit des menschlichen Sprachbaues und ihren Einfluß auf die geistige Entwickelung des Menschengeschlechts*. Cambridge: Cambridge University Press. Original edition, Berlin: Königliche Akademie der Wissenschaften, and F. Dümmler, 1836.

McGregor, William B.
2002 *Verb Classification in Australian Languages*. (Empirical Approaches to Language Typology 25.) Berlin/New York: Mouton de Gruyter.

McKay, Graham R.
1975 Rembarnga: A language of Central Arnhem Land. Ph.D. diss., Australian National University.
1988 Figure and ground in Rembarrnga complex sentences. In *Complex Sentence Constructions in Australian Languages*, Peter Austin (ed.), 7–36. (Complex Sentence Constructions in Australian Languages 15.) Amsterdam/Philadelphia: John Benjamins.

Merlan, Francesca
1976 Noun incorporation and discourse reference in Modern Nahuatl. *International Journal of American Linguistics* 42 (3): 177–191.
1983 *Ngalakan Grammar, Texts and Vocabulary*. (Pacific Linguistics B 89.) Canberra: Australian National Univeristy.

Mithun, Marianne
1984 The Evolution of Noun Incorporation. *Language* 60 (4): 847–894.

Nordlinger, Rachel and Adam Saulwick
2002 Infinitives in polysynthesis: The case of Rembarrnga. In *Problems of Polysynthesis*, Nicholas Evans and Hans-Jürgen Sasse (eds.), 185–201. (Studia typologica 4, special issue of Sprachtypologie und Universalienforschung.) Berlin: Akademie Verlag

Sadock, Jerrold
1980 Noun incorporation in Greenlandic: A case of syntactic word formation. *Language* 56 (2): 300–319.
1986 Some Notes on Noun Incorporation. *Language* 62 (1): 19–31.

Sapir, Edward
1949 *Language: An Introduction to the Study of Speech*. New York: Harcourt, Brace & World.

Saulwick, Adam
2003 Aspects of the verb in Rembarrnga: A polysynthetic language of northern Australia: Grammatical description, texts and dictionary. Ph.D. diss., University of Melbourne.
2006 Rembarrnga Nominal Incorporation in cross-linguistic perspective. Paper presented at the Amsterdam Center for Language and Communication seminar series, University of Amsterdam.
in press Incorporating the interpersonal: Some topic manipulation in Rembarrnga. In *The Interpersonal Grammar: A Cross-Linguistic Perspective,* Evelien Keizer and Miriam van Staden, (eds.). *Linguistics* (special issue).
Seiler, Hansjakob
2001 The operational basis of possession: A dimensional approach revisited. In *Dimensions of Possession*, Irène Baron, Michael Herslund, and Finn Sørensen (eds.), 27–40. (Typological Studies in Language 47.) Amsterdam/Philadelphia: John Benjamins.
Spencer, Andrew
1999 Chukchee and polysynthesis. In *Tipologija i teorija jazyka – ot opisanija k ob"jasneniju. K 60-letiju Aleksandra Evgen'evicha Kibrika*, Ekaterina V. Raxilina, and Jakov G. Testelec (eds.), 106–113. Moskva: Jazyki russkoj kul'tury.
Swanton, John. R.
1911 Haida. In *Handbook of American Indian Languages, Part 1*, Franz. Boas (ed.), 205–282. (Smithsonian Institution, Bureau of American Ethnology Bulletin 40.) Washington, DC: Government Printing Office.
Whitney, William Dwight
1867 *Language and the Study of Language: Twelve Lectures on the Principles of Linguistic Science*. London: N. Trübner & Co.

Suppletion from a typological perspective

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1. Introduction

The term *suppletion* refers to the phenomenon whereby regular semantic relations are encoded by unpredictable formal patterns.[1] Examples, which by now have become standard, include expressions of comparative and superlative degrees of the English adjectives *good* and *bad*, or the present and past tense forms of the English verb *go*.[2]

(1) English (Indo-European, Germanic)

a. POSITIVE	COMPARATIVE	SUPERLATIVE	b. PRESENT	PAST
good	*better*	*best*	*go*	*went*
bad	*worse*	*worst*	cf. *dance*	*danced*
cf. *fine*	*finer*	*finest*		

The phenomenon illustrated in (1) is encountered with various lexico-syntactic categories other than adjectives and verbs. In this study I focus exclusively on stem suppletion in verb paradigms.

Cases of stem change similar to the ones above are observed in many languages. Since they appear as obvious deviations from language specific morphosyntactic patterns, the mainstream view of suppletion is to consider the phenomenon as marginal and random. Both of these characterizations follow from the fact that most studies on suppletion have been heavily biased towards one language family or another. A true cross-linguistic perspective on the phenomenon is generally missing. Moreover, most accounts of suppletion as well as the discussion of its status in various languages, are typically grounded in a particular theoretical framework, and are presented with little or no empirical basis (cf. Rudes 1980; Mayerthaler [1981] 1988; Dressler 1985; Bittner 1996; Wurzel 1990; Aronoff and Anshen 1998: 239).[3] This is hardly justifiable for a phenomenon that demonstrably affects the most common words in the languages where it is found. As such it is far from marginal and deserves to be treated in its own right, similarly to any other phenomena that have been discussed in typology.

The purpose of this paper is to re-examine suppletion from a typological perspective and to further explore its implications. In Section 2, I outline, in very broad terms, the criteria used for identifying cases of suppletion. In Sections 3 and 4, I proceed with a presentation of the cross-linguistic data collected in this study. These data can be grouped in several broad types of suppletion, some of which are a matter of dispute in theoretical morphology. As we shall see, the types identified here can be correlated with different geographical areas and appear to be genealogically stable. I take these facts as a proof that the kinds of suppletion discussed here are real phenomena regardless of conflicts in views about their theoretical status. In the concluding section (Section 5), I offer a discussion on the nature of exceptions in language; as regards suppletion, I argue that it is not to be viewed as a morphological irregularity but rather as a feature of structural complexity motivated by the function and meaning(s) of particular verbs.

2. Criteria for suppletion

As in many other typological studies, no particular theoretical framework is adopted here, apart from what has started to gain currency as Basic Linguistic Theory (Dixon 1997; Dryer 2001), in that some basic notions such as nouns, verb, grammatical category etc are assumed. Due to space restrictions, the criteria for suppletion are only briefly stated here (see Veselinova 2006: 46-9 for a detailed presentation).

Any unpredictable or irregular encoding of a category X is referred to as suppletion, like in English *go* vs. *went*. However, it is crucial that the category X be otherwise regularly expressed by a fairly well-defined morphosyntactic construction, like the English regular past tense formation (e.g., *dance* vs. *danced*) or sub-productive patterns (e.g., *sing* vs. *sang*). Sub-productive patterns with that cover no more than two lexemes are considered border cases of suppletion. As for the notion of construction, both bound morphological and syntactic expressions are considered.

Both inflectional and derivational patterns are examined when examples of suppletions are collected in a given language. I have taken the *scope* of a particular pattern as a main criterion for whether a paradigmatic contrast can be said to exist in a given language. Scope is defined here as the approximate number of words/tokens to which a pattern is applicable. The wider the scope of a particular pattern, the more it looks obligatory, and thereby exceptions to this pattern appear to have a closer *paradigmatic* relation.

I define formal irregularity by using purely synchronic criteria, e.g., etymologies are not taken into account when determining whether two forms are suppletive or not. Thus *am* vs. *are* vs. *is* are considered suppletive according to person-number regardless of the fact that all three are historically forms of one and the same Indo-European stem **es*. Suppletive forms are those which clearly do not conform to existing morpho-phonological patterns in language Z.

A suppletive form has to be obligatory in contexts that otherwise require marking of category X. That is, every time past tense is to be expressed for the English verb *go*, the form *went* has to be used. If both a suppletive and a regular form are used for the expression of a certain category, this is coded as *alternation*. For instance, in Bulgarian (Indo-European, Slavic; own data), the verb *idvam* 'come' has both a suppletive imperative *ela* and a regularly derived one *idvaj*. These forms are completely interchangeable in all possible contexts of use. Therefore, they are said to *alternate*.

A distinction is made between *categorical* and *non-categorical* suppletion. Paradigms where there is one stem per category are classified as cases of categorical suppletion; paradigms where the suppletive forms represent syncretism of several categories are considered cases of non-categorical suppletion. These two kinds are illustrated in (2) below.[4]

(2) Two kinds of stem change

a. English 'go'

	PRESENT	PAST
1SG	*go*	*went*
2SG	*go*	*went*
3SG	*goes*	*went*
1PL	*go*	*went*
2PL	*go*	*went*
3PL	*go*	*went*

b. French 'go'

PRESENT	IMPERFECT
vais	*all-ais*
vas	*all-ais*
va	*all-ait*
all-ons	*all-ions*
all-ez	*all-iez*
vont	*all-aient*

The English verb *go* uses one stem for all non-past tense forms, and another for the past. This is not the case with the French verb *aller* 'go', a partial paradigm of which is shown in (2b). In the present tense, the only forms which can be subject to a traditional morphemic analysis are the first and second person plural, *all-ons* and *all-ez*; the remaining forms, *vais, vas, va* and *vont* are best described as unique and cannot be further analyzed into separate morphemes based on synchronic criteria. So there is no single stem for the present tense or for any of the other pertinent catego-

ries, that is, person on number. As such, the case of *aller* is not identical to the kind of suppletion found in *go* which is why it has to be coded differently. Usually, the French verb *aller* tends to be cited as an example of person/number suppletion, in addition to tense. However, this is incorrect because, as discussed here, there is no separate stem for either of these categories.

As we shall see in the presentation below, categorical and non-categorical suppletion differ typologically in several respects.

3. Overview of the collected data

The data discussed in this study come from a 193 language sample which was used for the WALS project (Veselinova 2005a,b; Stolz and Veselinova 2005) and likewise in Veselinova (2006). The sample has a slight bias since some phyla, such as Indo-European (the Slavic genus in particular) and Uto-Aztecan are better represented than others for a number of reasons. I have tried to make up for this by calculating the cross-linguistic frequency of suppletion in four different ways, two of which are presented in a summarized form below: the raw language count on the languages of the sample and the count on linguistic genera instead of languages for which I follow Dryer (1989, 1992; see also Veselinova 2006, Chapter 2 for details on sampling and various counting procedures).

Depending on their occurrence in the investigated languages I distinguish *major types* of suppletion (those which occur in more than 10 genealogically distinct languages, that is languages which belong to completely different phyla in the WALS classification) and *minor types* (those that occur in maximum 10 genealogically different languages). Major types are non-categorical, tense-aspect, imperative, verbal number and polarity suppletion. The minor suppletion types include suppletion according to person-number of subject or object, form of object (free or bound), mood (other than imperative), and honorifics. Surprisingly, person-number suppletion, usually listed as one of the common kinds of suppletion (cf. Rudes 1980; Mel'čuk 1994), qualifies only as a minor type here. However, as pointed out in Section 2 above, many cases of non-categorical suppletion have been reported as person-number suppletion.

Here I will concentrate on major types which can be further correlated with particular lexemic groups, language families, and geographical areas. It turns out that those which are more disputed from a theoretical point of view, e.g., verbal number suppletion, are more coherent areally than those

which are more typical cases, although cited under a different name, e.g., non-categorical suppletion. Based on the correlations mentioned above, I argue that suppletion is not to be considered as an accidental and haphazard phenomenon, but rather that it is semantically, and, in some instances also pragmatically, motivated. Suppletion examined from a typological perspective emerges as a gradable phenomenon not only according to form, but also according to the status of a category for which it is postulated. Thus some cases of suppletion are more prototypical than others, and on a grammatical-lexical scale, some cases of suppletion come closer to the grammatical end whereas others appear closer to the lexicon. Finally, this empirical approach to suppletion shows that the term is used to cover a variety of distinct phenomena which show different cross-linguistic behaviour.

4. Types of suppletion examined here

4.1. Non-categorical suppletion

A paradigm with non-categorical suppletion may consist of forms which are completely distinct from each other in the sense that no language specific morpho-phonological rules can be postulated for their derivation. Such paradigm is illustrated by the Basque verb *izan* 'be' in (3) below.

(3) Basque (Basque; King 1994: 363)

	PRESENT	PAST
1SG	*naiz*	*nintzen*
2SG	*zara*	*zinen*
3SG	*da*	*za*
1PL	*gara*	*ginen*
2PL	*zarete*	*zineten*
3PL	*dira*	*ziren*

While paradigms like the one above may appear completely idiosyncratic within a single language system, cross-linguistically, they show several similarities. Paradigms with non-categorical suppletion share the following characteristics: (i) positions in there paradigm where suppletive forms occur (or following Bybee (1985), occurrence of *autonomous* forms); (ii) the tense categories where such forms occur; (iii) the uses and function of such verbs in the languages where they are found.

For such paradigms, it is very common for the irregularity to be restricted to one or two forms in the paradigm, usually to third person, either singular or plural or both. This is exemplified below by the verbs 'be' and 'go' in Fur, example (4) below.

(4) Fur (Nilo-Saharan, Fur; Angelika Jakobi, p.c.)

a. 'be'	PRESENT	PAST	b. 'go'	PRESENT	PAST
1SG	*àŋ*	*àáŋá*		*ànnì*	*íò*
2SG	*ɟàŋ*	*ɟàáŋá*		*ɟànnì*	*ɟíò*
3SG	***ìì***	*àáŋá*		***dúítì / dúì***	***àŋá***
1PL	*kàŋ*	*kàáŋá*		*kànnì*	*kíò*
2PL	*bàŋ*	*bàáŋá*		*bànnì*	*bíò*
3PL	***gé***	***kèìŋ***		*kànnía*	***kéŋè***

The cross-linguistic distribution of such paradigms in specific tenses is uneven. The most common case is that such paradigms are restricted to the present tense as in French in (2b) above (31 languages out of 39 or 79.48%).[5] The occurrence of autonomous forms in both present and past tenses as in Basque, (3) above, is much less common (9 languages out of 39 or 23%). Finally, there are two languages, Maltese and Fur, which have verbs where the irregularity is restricted to past tense only (see examples [5] and [6] below). I am not aware of any languages where autonomous forms of the kind shown above are found in the future tense only.

Observations of tendencies such as those just mentioned are not new per se. Mayerthaler (1988: 105) notes that in a number of West Indo-European languages, the verbs meaning 'be' have suppletive paradigms and that the third person singular of these verbs is formally very simple. He quotes the paradigms of the verbs 'be' from German, Latin, Old Icelandic and Portuguese. According to him, it is a noteworthy fact that even such strongly suppletive paradigms conform to general markedness hierarchies which state that the unmarked present tense shows more morpho-phonological irregularities than the marked tenses. However, since by his own definitions, such paradigms are, "contra-iconically" coded, they remain anomalous in his view.

The generalizations offered in Bybee (1985) are especially relevant here. Unlike natural morphologists, Bybee does not presuppose "one-form-one-meaning transparency principle". On the contrary, she predicts that verbs with multiple functions will have paradigms where forms easily dissociate from each other. In the group discussed here, most of the verbs with paradigms where the forms show various degrees of autonomy are used

with various grammatical functions in their respective languages. There is a clear correlation between a paradigm that consists exclusively (or nearly exclusively) of autonomous forms only and the auxiliary status of the word expressed by it. In my database there are 65 verbs with non-categorical suppletion; 47 of them are auxiliaries of some kind in their languages. In fact, we can say that the form of these verbs is motivated by their functions: a verb such as 'be' or a grammaticalizing 'go' verb cannot be structurally similar to verbs such as 'clean' or 'dance' when their scopes of use are completely different. However, there are a few verbs with non-categorical suppletion which are not auxiliaries such as the verb 'say' in Maltese and the verb 'kill' in Fur. Yet, a motivation for the structure of their paradigms in terms of use and function can still be suggested.

(5) Maltese *għ(i)d-* 'say' (Afro-Asiatic, Semitic; Borg and Azzopardi-Alexander 1997: 357)

	PERFECT	IMPERFECT	IMPERATIVE
1SG	*għidt*	*ngħid*	–
2SG	*għidt*	*tgħid*	*għid*
3SG.M	***qal***	*jgħid*	–
3SG.F	***qalet***	*tgħid*	–
1PL	*għidna*	*ngħidu*	–
2PL	*għidtu*	*tgħidu*	*għidu*
3PL	***qalu***	*jgħidu*	–

Most of the forms in the Maltese paradigm above are derived from a single base *-għ(i)d-*. The only exceptional forms are the third person forms of the perfect, which is used as perfective and past. However, it is not at all surprising that exactly those forms are different. They are certainly the most frequent forms in the entire paradigm, if one thinks about the most common uses of a verb such as 'say'. In fact, it is cross-linguistically very common that third person forms of 'say' verbs detach from the rest of their paradigms and evolve into quotative and even evidential markers.

In Fur, the verb 'kill', shown in (6), has different stems for present and past. Its paradigm is further complicated by the fact that the third singular of the past tense has a special form which is completely different from the other two stems of the paradigm.

(6) Fur 'kill' (Nilo-Saharan, Fur; Angelika Jakobi, p.c.)

	PRESENT	PAST
1SG	*ìì̀rù*	*àwì*
2SG	*ɟìì̀rù*	*ɟàwì*
3SG	*íírù*	*fùì*
1PL	*kìì̀rù*	*kàwì*
2PL	*bìì̀rù*	*bàwì*
3PL	*kìì̀rɛ̀*	*kàwìŋɛ̀*

Again, if we think about the most frequent way a verb such as 'kill', would be used, it is most probably third person in narrative contexts. So from a functional perspective, a special form for the third singular past is fully motivated.

As regards distribution of non-categorical suppletion, the following can be said: such paradigms are observed in 39 languages of the sample (20.21%) and in 27 out of 150 genera (18%). Non-categorical suppletion shows a clear concentration in Eurasia but also occurs in all other continents. In terms of distribution of lexemic groups, the majority (66.15%, cf. Veselinova 2006: 87) of the verbs with non-categorical suppletion are glossed either as 'be' or verbs of motion.

A connection to the generalizations offered by David Fertig (1998) is in order here. He makes a distinction between general and category specific suppletion. General suppletion affects grammatical or grammaticalizing items whereas category specific suppletion results from the high relevance of a particular category to the meaning of a verb. Following Fertig, non-categorical suppletion can also be described as general suppletion; the remaining types of suppletion can be shown to be category specific cases of suppletion which obey Bybee's relevance hierarchy.

4.2. Suppletion according to tense-aspect categories

4.2.1. Suppletion according to tense

Within the domain of tense, suppletive forms are typically used to encode a binary contrast, as for instance, present vs. non-present as in Brahui in (7). Other variants of a two way distinction, which cannot be illustrated here due to space restrictions, include future vs. non-future or past vs. non-past. There are also a few cases where three different stems are used for the

encoding of categories such as present, past and future for one and the same verb.

(7) Brahui (Dravidian, Northern; Andronov 1980: 57-69)

(a)kā-va	go-PRES/FUT.1SG
ʔinā-ø	go-PST.3SG
(a)ʔinā-ra	go-PST_PROG.3PL
ʔin-ik	go-POTENTIAL FUT.3SG
ʔina-ne	go-PST.PERF.3SG

The use of suppletive forms to mark remoteness distinctions within tense is much less common. In the current sample it is observed, only in languages from New Guinea, illustrated below by (8) from Usan.

(8) Usan (Trans-New Guinea, Madang; Ger Reesnik, p.c.)

qur-aum	say-1SG.PRES
qur-umei	say-1SG.REC.PST
qam-amei	say-1SG.REM.PST
qemer-ib-am	say-FUT-1SG
qemer-in	say-UNCERTAIN.FUT.1SG

4.2.2. Suppletion according to aspect

In the majority of the languages where suppletion according to aspect is observed, the suppletive forms express the main aspectual categories such as imperfective vs. perfective illustrated by Modern Greek.

(9) Modern Greek (Indo-European, Greek; Joseph and Philipaki-Warburton 1987: 196)

tro(γ)-õ	eat.IPFV-1SG.PRES
e-troγ-a	AUGMENT-eat.IPFV-1SG.PST
θa troγ-õ	FUT eat.IPFV-1SG.PRES
θa faγ-õ	FUT eat.PFV-1SG.PRES
e-faγ-a	AUGMENT-eat.PFV-1SG.AOR

Suppletive forms may be used to mark some less general aspectual distinctions but this is rather unusual. In the sample such verbs are attested in Chalcatongo Mixtec, a language from Oaxaca, Mexico, and Mara, a Non-Pama Nyungan language from Northern Australia.

(10) Chalcatongo Mixtec (Oto-Manguean, Mixtecan; Macaulay 1996: 170)

nbíí	come.HAB
bèì	come.PROG
na-kii	PFV-come

Marking of aspect shows varying degrees of generality, obligatoriness and uniformity of expression. In Modern Greek and Chalcatongo Mixtec above, marking of aspect is obligatory for the verbs in these languages and can thus be described as inflection. In Slavic languages, on the other hand, it is very much an issue of word formation. For instance, in Slovene, the imperfective-perfective distinction is expressed by several formal means: prefixation as in *kriti* vs. *po-kriviti* 'cover', suffixation as in *kupo-va-ti* vs. *kupiti* 'buy', stem modification as in *za-pírati* vs. *za-préti* 'close, shut', and finally by using completely different verbs *praviti* vs. *reči* 'say'. Most verbs in Slovene can be classified by either perfective or imperfective; the system is complicated by what is usually referred to as *secondary imperfectivization* and by the existence of *biaspectual* verbs. By the first, an imperfective verb can be derived from a derived perfective as in *pokri-va-ti* which is derived from the perfective *pokríti*. The imperfective verb derived from the perfective one may indicate iterative or delimitative action in addition to the unfolding imperfective action, that is *pokrívati* means 'cover, cover a little'. Biaspectual verbs such as for instance *rodíti* 'give birth', *darováti* 'give, donate' are simple non-derived verbs[6] which can be used in both imperfective or perfective aspect. Thus marking of aspect in Slovene is very diverse, lexically conditioned and not particularly regular. So in this respect, verb pairs such *praviti : reči* (say.IPFV : say.PFV) do not satisfy one of the criteria for suppletion stated in Section 2 above. However, marking of aspect is also so widespread that it looks obligatory (see also Dahl 1985: 89). Thus postulating suppletion according to the general imperfective: perfective distinction is justified for the observed cases in Slavic languages inasmuch as this distinction is so commonly coded on the majority of their verbs.

4.2.3. Less common cases of suppletion in tense-aspect categories

In this section I discuss less common cases of suppletion which cover very complex paradigms with stem change in several tense-aspect categories as well as suppletive perfects.

Complex paradigms where different stems are used for the encoding of both tense and aspect categories are not particularly common but in a typology of suppletion in verb paradigms they need to be set apart from other verbs where separate stems are used for the encoding of either tense or aspect.[7] Such complex paradigms are exemplified below by Georgian in (11).

(11) Georgian (Kartvelian; Hewitt 1995: 469–470)

v-e-ubn-eb-i	1SG-VV-tell.IPFV-TS-IND (=PRES.1SG)
v-e-ubn-eb-od-i	1SG-VV-tell.IPFV-TS-IMPF-IND (=IMPF.1SG)
v-u-txar-i	1SG-VV-tell.PFV-IND (=AOR.1SG)
v-e-t'q'v-i	1SG-VV-tell.FUT-IND (=FUT.1SG)

There are a few cases where the only irregularity in the paradigm is the use of a suppletive stem for the perfect as illustrated below by Pipil, a language from El Salvador.

(12) Pipil (Uto-Aztecan, Aztecan; Campbell 1985: 94–5)

ni-k-ida-Ø	1SG.SUBJ-SG.OBJ-see-PRES	'I see it'
ni-k-ida-k	1SG.SUBJ-SG.OBJ-see-PST	'I saw it'
ni-k-its-tuk	1SG.SUBJ-SG.OBJ-see-PERF	'I have seen it'

I am aware of four other languages, Modern Greek, Serbian-Croatian, Macedonian and Bulgarian (curiously all from the Balkans) where a special form for the perfect is observed, with no other irregularity in the paradigm.

Suppletion of the form used for the perfect (typically a participle) is, however, observed in paradigms where other kinds of suppletion are present too as in the Germanic languages, as in English *am, was, were, been.*

4.2.4. Lexical, genealogical and areal distribution of tense-aspect suppletion

The number of suppletive verbs per language which use different stems for tense-aspect categories tends to range from 1 to 5. There are a couple of languages, such as Lezgian (15) and Irish (10) where the number of such verbs is higher, but this is rather unusual. The lexemic groups occurring with tense-aspect suppletion tend to be verbs of very general content. However, the distribution is not random as shown in Veselinova (2006, see also

Table 1 below). Specifically, it is possible to outline lexical hierarchies for the occurrence of tense-aspect suppletion. Thus if language has tense-aspect suppletion with a verb such as 'say', 'do' or 'see', it will most probably also have suppletion with 'be' or the general motion verb 'come' or 'go'. Furthermore, it can be demonstrated that the occurrence of suppletion follows the Relevance Hierarchy suggested by Bybee (1985), cf also the discussion in 4.5 below.

Suppletion according to tense-aspect categories is by far the most widespread kind of stem change. In the sample it is observed with 75 languages (38%), in 55 out of 150 genera (36.6%) and in 25 phyla. Tense-aspect suppletion appears especially stable in Indo-European, Northwest Caucasian, Nakh-Daghestanian, Kartvelian, Southern Uto-Aztecan and Oto-Manguean, Carib, and Sepik-Ramu. This kind of suppletion shows clear areal patterning in that it is concentrated in Western Eurasia; two other hotbeds are observed in Meso-America and Papua New Guinea. The only three Australian languages where tense-aspect suppletion is attested are in Northern Australia.

4.3. Suppletion according to imperative

In this section I present paradigms with suppletive forms for either imperative or hortative moods. Typically, the use of a special form for any of these moods singles them out against all other existing moods in a given language. In the examples below, imperatives or hortatives are shown in contrast with indicative forms.

(13) Jakaltek, (Mayan; Day 1973: 61)

chach titoj	you come.2SG.IND.FUT
cata	come.2SG.IMP

(14) Krongo (Kadugli; Reh 1985: 198)

càáw	go.INF
yàáw	go.IMP.2SG
t-ín-tí	INF-go-HORTATIVE.1SG

In the current database, suppletive imperatives appear more common than suppletive hortatives. It is probably worth noting that languages show either one or the other; I am not aware of any language where both are encountered.

Van der Auwera and Lejeune (2005) observe that languages may have more than one imperative paradigm, distinguished along parameters like tense (most typically present vs. future), aspect (e.g., perfective vs. imperfective), politeness, movement towards or away from speaker, voice or transitivity. Such distinctions do not appear to be relevant for suppletive imperatives. In my database, there is, however, one language, Ingush, where the imperative of the verb 'come' has two separate suppletive forms that differ with regard to time reference as shown in (15) by the Ingush verb 'come'.

(15) Ingush (Nakh-Daghestanian, Nakh; Johanna Nichols, p.c.)

	INDICATIVE	IMPERATIVE
PRES	*d-oagha*	*d-iel* ('come right now!', specific time)
FUT	*d-oaghaddy*	*d-oula* ('come!', future or unspecified time)

The number of verbs with suppletive imperatives per language is very restricted, usually one or two verbs at the most. The verbs with suppletive imperatives in the current database fall into nine semantic groups. However, the group of basic motion verbs such as 'come' and 'go' has an apparent dominance over all other verbs in that they represent 70% of the suppletive imperative verbs (see Veselinova, 2006: 139). This can hardly be an accident as one of the most common ways to use the imperative is with motion verbs. Hence separate expressions for this function are motivated. The imperative as category is likewise highly relevant for the other verbs with suppletive imperatives which show a somewhat lower cross-linguistic frequency of occurrence: 'give' and 'say' when used with personal deixis e.g., 'give me'/'tell me',[8] 'sit down' as an invitation or 'take' in the sense 'help yourself'.

Suppletive imperatives are observed in 41 languages of the sample (21%) and in 32 out of 150 genera which come from 17 phyla. The phenomenon appears to be very stable in the Afro-Asiatic phylum, particularly in the Semitic, Berber and Cushitic families. Suppletive imperatives show a clear concentration in Africa, in the Arabic-speaking Middle East and in parts of Europe including the Caucasus. Its areal distribution is very different from tense-aspect suppletion. While it forms less coherent areas than tense-aspect suppletion does in Europe and Western Asia, still areal patterning is obvious, and it is worth noting that imperative suppletion includes areas and families which are usually claimed to lack suppletion completely.

While relatively restricted, suppletion in imperative can hardly be described as an accidental or unnatural phenomenon. Command and motion (or insentive to motion) form a coherent semantic whole which is why it is not strange to find unified lexical expressions where they are fused together. Verbs restricted to the imperative function as well as particles which acquire regular verb morphology represent such expressions; they appear to be regular sources for suppletive imperatives. Another diachronic source appears to be borrowing in a situation of intensive language contact. It can hardly be surprising that exactly commands for simple motion are passed on from a language with greater prestige and whose speakers have more power to the speakers who have less. Thus this phenomenon appears both semantically and pragmatically motivated, which in turn should preclude describing it as haphazard or unsystematic.

4.4. Verbal number suppletion

It is a controversial issue whether to consider exceptions to derivation patterns as cases of suppletion. This controversy becomes especially apparent when expressions for verbal number are discussed. Verbal number as a category can reflect the number of times an actions performed, *event number*, or the number of participants in the action, *participant number* (see Corbett 2000: 246). Event number often comes very close to aspect and participant number can be hard to tell apart from nominal number as reflected in agreement. Except for the cases when participant number is practically undistinguishable from agreement, verbal number rarely becomes inflectional. For this reason and based on work by Mithun (1988) and Durie (1986), Corbett (2000: 258) claims that it is misleading to describe the data in (16) as well as all subsequent examples in this section as cases of suppletion. In what follows below, I will present some basic facts about lexical expressions for verbal number, proceed on to discuss their status in a typology of suppletion and on a more general level, their status as a full fledged linguistic phenomenon. I use the terms 'verbal number pair/triple' and 'verbal number suppletives' interchangeably.

The verbal number distinctions indicated by separate verb stems are singular vs. plural or singular vs. dual vs. plural.[9] The latter is illustrated in (16) by Koasati.

(16) Koasati (Muskogean; Kimball 1991: 324)

a.	*á:t*	dwell.3SG	b.	*walí:k*	run.3SG
	ásw	dwell.3DU		*tółk*	run.3PL
	ís	dwell.3PL			

In the languages where triples indicating singular vs. dual vs. plural shown in (16a), pairs that indicate singular vs. plural as in (16b) are also found (as in Koasati above). There are languages where only singular vs. plural pairs are observed. This latter group is illustrated by (17) Krongo.

(17) Krongo (Kadugli; Reh 1985: 198)

a. *ò-cóonì-ící* VERB.MARKER-call.SG.ACTION-SUFF
b. *ò-múnó-óní* VERB.MARKER-call.PL.ACTION-SUFF

The verb pair in (17) represents event number; functionally, they are very close to verbal aspect: single-event verbs like the one in (17a) express punctual action whereas the plural-event (pluractional) verbs as the one in (17b) usually express iterative or habitual action. Verbal number in Krongo is clearly derivational in that it can be expressed by various formal means which are lexically conditioned: (i) prefixation as *à-mà* 'VERB.MARKER-answer' vs. *t-èe-mà* 'VERB-MARKER-PL-answer'; (ii) tone as in *ò-kídò-ònò* 'VERB.MARKER-cut off-SUFF' vs. *ò-kìdò-onò* 'VERB.MARKER-cut off.PL-SUFF' (iii) reduplication and *t-áa-ʈà* 'VERB.MARKER-PREF-go out' vs. *à-ʈàa-ʈá* 'VERB.MARKER-RDP-go out' (iv) suppletion as shown in (17) above.

Participant number is illustrated by Ute.

(18) Ute (Uto-Aztecan, Numic; Givón and Southern Ute Tribe 1980: 42)

a. *Taʔwa-ci* *ʔu* *pʉi-pʉga*
man-NOM-SUFF he sleep.SG-REM
'The man slept'

b. *ta:taʔwa-ci-u* *ʔumʉ* *kway-pʉga*
RDP-man-NOM:SUFF-PL they sleep.PL-REM
'The men slept'

(19) Ute (Uto-Aztecan, Numic; Givón and Southern Ute Tribe 1980: 122)

a. *siva:tu-ci* *ʔuru* *paχa-gu:-pu̥*
goat-NOM be kill.SG-MOD-NOM
'I wish s/he would kill the goat'

b. *siva:tu-ci* *ʔuru* *paχa-qa-gu-pu̯*
goat-NOM be kill.sg-PL-MOD-NOM
'I wish they would kill the goat'

For participant number it is characteristic that it operates on an "ergative" basis (number of subjects for intransitive verbs like 'go', 'run', number of objects for transitive verbs like 'take', or 'kill'), but even this is not to be understood in the sense of a strict absolutive agreement. With comitative constructions, for instance, ('go/come with somebody'), participant number is the number of subject and companion together as in (20) below.

(20) Navajo (Na-Dene, Athapaskan; Jeanne, Hale & Pranka 1984, quoted in Durie 1986: 358)
a. *shí* *ashkii* *bi-ɬ* *yi-sh-'ash*
I boy him-with PROG-1SG-walk:DUAL
'I am walking with the boy'
b. *nihí* *-ɬa'* *di-iid-ááɬ*
we subset FUT-1NONSG-walk:SG
'One of us will go'

The agreement affixes *-sh-* (1SG) in (20a) and *-iid-* (1NONSG) in (20b) follow the number of subject, the selection of stems follows the number of participants.[10]

Verbal number pairs or triples of the kinds discussed above are observed in 33 languages (17%) of the sample and 31 out of 150 genera (20.7%), which come from 22 phyla (see also Veselinova 2006: 157). The phenomenon appears especially stable in Hokan, Kiowa-Tanoan, Muskogean, Na-Dene and Uto-Aztecan (specifically, in the following families: Numic, Takic, Sonoran, Hopi; that is, all Uto-Aztecan families included in my sample except Aztecan proper). Apart from the obvious concentration in North America, verbal number suppletion can be also found in Africa, Eurasia, South America. Its lowest concentration appears to be in South East Asia and Australia-New Guinea. While it cannot be described as particularly frequent, there is enough evidence for describing it as a linguistic feature which occurs regularly in specific parts of the world, language families and genera within larger linguistic phyla. So it is not an exotic feature of extreme rarity either.

The number of such verbs per language shows greater variation in the number of verbs per languages as well as in the meanings covered when compared with the number of verbs with non-categorical suppletion, tense-

aspect or imperative. In half of the languages such verb pairs/triples range between one and four, in the other half, their number is between five and ten, and even as many as eighteen, as in !Xun (Ekoka; Khoisan, Northern Khoisan). Unlike the other major types of suppletion, the verb meanings observed here can be very specific, as for instance, the Hopi verbs *-toni* 'go around something out of sight (SG)' vs. *-kya* 'go around something out of sight (PL)', but together with such meanings we encounter semantically general verbs such as 'go' and 'sit' and finally grammaticalized or grammaticalizing lexical items. Yet a fair amount of what Wälchli (2006) calls *internal coherence*[11] can be demonstrated for verbal number pairs/triples. First, it is possible to group the meanings around very few concepts such as 'motion', 'position', 'die/injure,[12] 'state' and 'dimension'. Second, it is possible to predict which meanings are mostly likely to be encountered if a language has such pairs or triples (verbal number lexicalization, suppletion hierarchy, see Veselinova 2006: 155). Specifically, the hierarchy states that if a language has verbal number pairs at all, they will most probably be verbs such as 'go', 'sit' and 'die' rather than transitive verbs of motions such as 'give' and 'take' or verbs from other semantic fields. All languages with verbal number pairs examined here, except Ket, corroborate this generalization.

As for the status of these verb pairs or triples on being suppletive or not, the following can be said. First, in Veselinova (2006) as well as here I have assumed a more functional approach to derivation than is usually done. Thus, while recognizing that verbal number is derivational rather than inflectional, I can still postulate exceptions to patterns regularly used for its expression and thereby suppletion. Second, for some languages, such as Murle (Nilo-Saharan, Surmic) and Shipibo-Konibo (Panoan), it can be demonstrated that the verbal number pairs/triples are part of the agreement system. Third, since this is a typology of suppletion in verb paradigms, we should be able to include in it both the most prototypical cases (such as non-categorical and tense-aspect suppletion) and the more peripheral ones such as verbal number suppletion. Ultimately, however, as Wälchli (2006) points out, the really important issue is not so much what label we decide to use to refer to these pairs/triples but rather that we recognize them as a separate linguistic phenomenon, with it own characteristics both in the languages where it is observed and cross-linguistically. Data from parallel texts provided by Wälchli (2006) are used for the concluding discussion below.

Corbett (2000) brings to light two important aspects of verbal number as category (i) participant number from agreement and (ii) verbal number

is derivational rather than inflectional. However, Corbett (2000: 258–259) also states that verbal number pairs or triples as for instance 'kill one' vs. 'kill many' (cf. [19] from Ute above) are simply different words similar to the English words *kill* vs. *massacre* and *run* vs. *stampede*. The latter does not hold if we look at the use of such words in texts, as Wälchli (2006) demonstrates. In fact, it turns out that verbal number pairs are fairly easy to locate in texts and that there is little difference, if any, between between nominal number as reflected in agreement and participant number as shown in (21) below.

(21) Wälchli's data from parallel Gospel texts

	Verse	Verb Gloss	Samoan	Toaripi	Spanish
a.	Mark 5:6	run SG	*momo'e*	*soeai*	*correr*
b.	Mark 15:36	run SG	*momo'e*	*soeai*	*correr*
c.	Mark 6:33	run PL	*taufetuli*	*oroai*	*correr*
d.	Mark 9:15	run PL	*taufetuli*	*oroai*	*correr*
e.	Mark 14:52	flee SG	*sola*	*soeai*	*huir*
f.	Mark 5:14	flee PL	*sosola*	*oroai*	*huir*
g.	Mark 14:50	flee PL	*sosola*	*oroai*	*huir*

Whatever the theoretical status of the forms represented in (21) may be, it is clear that Samoan and Toaripi have an opposition of singular and plural stems for 'run' while English and Spanish do not. Furthermore, English, Samoan and Spanish make a distinction between 'run' and 'flee' while Toaripi does not. In Samoan, the plural form of *sola* 'flee' is formed by partial reduplication whereas the plural form of 'run' is a different stem. Evidence like this leaves little room for doubt that regardless of how we decide to refer to them, the Samoan verbs *momo'e* vs. *taufetuli* and Toaripi *soeai* vs. *oroai* are quite different from English *kill* vs. *stampede*. As Wälchli points out, what leads Corbett to claim that verb pairs such as the Samoan and Toaripi ones are simply different words is an inequality in traditional linguistic ontology. While inflection is conceived of at least partly as a functional phenomenon (Corbett discusses the inflectional category number), derivation is not and so the obvious parallel between Samoan *sosola* and *taufetuli* cannot be accounted for. A more functional approach to derivation would make it possible for such a parallel to be made. In Veselinova (2006: 167, 214) I account for this in by type "verbal number pairs are exceptions to productive derivational patterns" and another way of putting it is that Samoan *sosola* and *taufetuli* both belong to the

derivational category verbal plural, and thereby *momo'e* and *taufetuli* can be described as cases of verbal number suppletion.

As already stated above, however, it is not important whether suppletion or some other term(s) are used to describe the verb pairs/triples that have been the subject matter of this section. What is, however, significant for both language description and linguistic typology is that they be recognized as a phenomenon on its own right. Their characteristics as found in this sample together with their use in texts allow us to set them apart from other structural features in language in a positive way. First, verbal number pairs and triples show a high degree of lexical coherence in that they center around a limited number of concepts. Second, the order of occurrence of verb pairs and triples that express these concepts in the relevant languages is predictable. Third, such pairs and triples are in complementary use in texts. Fourth, we observed that they show genealogical and areal stability.

Before we turn to the discussion of the nature of exceptions in language, we shall first examine the lexemic groups which are most frequently encountered with them.

4.5. Correlation with lexemic groups

The verb meanings observed with the types of suppletion discussed above tend to cover very common, general concepts. In Table 1 below, I summarize the lexemic groups most commonly encountered with the types of suppletion presented here. The verb meaning 'lie' is observed with verbal number suppletion only but I included it nonetheless since it is one of the most frequent meanings with this type. The figures in the table indicate the raw count of languages with cases of suppletion for a particular meaning.

As demonstrated in Table 1, verbs such as 'be/exist' occur mostly with non-categorical (NC in Table 1) or tense-suppletion. The general verbs of motion, on the other hand, are encountered with every type of suppletion, a fact that sets up apart from all other lexemic groups presented in Table 1. There seems to be a clear preference for these verbs to occur with imperative suppletion. However, they are also strongly represented with all other suppletion types; moreover, they seem to be almost evenly distributed among them. The general motion verbs 'come' and/or 'go' show some kind of suppletion in 100 languages[13] of the whole sample. Even if stated in such raw figures, the tendency is still very strong to be ignored. In fact, it will be worth checking if basic verbs of motion are ever completely regular in a language.

Table 1. Verb meanings recurring with all types of suppletion

Verb meaning	NC	Tense	Aspect	Tense-aspect	Perfect	Imperative	Verbal number
be/exist	31	22	–	3	8	3	2
come/go	12	17	16	12	3	34	14
die	2	3	2	–	–	–	12
do	1	1	6	2	–	2	–
eat	2		4	–	–	1	3
give	3	4	3	1	–	5	3
have	3	2	–	–	–	–	–
hit	1	–	–	–	–	–	2
kill	1	–	–	–	–	–	9
lay/put	–	–	6	–	–	–	5
lie	–	–	–	–	–	–	12
say/speak	5	3	9	1	–	2	1
see/watch/look	1	1	7	–	1	–	–
sit	–	2	–	–	–	1	14
take	–	–	10	–	–	2	9

The remaining meanings show, in varying degrees, a preference for a particular type of suppletion. Thus 'die' occurs mostly with verbal number, 'say/speak' joint with 'see/watch/look', and likewise 'do' with aspect suppletion. It is easy to see that the meanings of a particular category where suppletion occurs are highly relevant to the verb meaning the suppletive stems express. Thus number of participants is highly relevant to killing or dying; aspect is highly relevant to moving, speaking, and seeing; likewise, to performing an action (verbs meaning 'do'), eating or moving; command and incentive to motion form a coherent semantic unit. As pointed out above such observations are completely in line with the Semantic Relevance Hierarchy suggested by Bybee (1985).

5. Discussion and concluding remarks

The four major types of suppletion show systematicity in the following respects: (i) They center around a limited number of concepts. It is also possible to set lexical hierarchies for suppletion whereby the likelihood of suppletion with different verbs is captured in a predictable way. (ii) The types of suppletion examined here are genealogically stable and at least to a certain extent, geographically coherent. In fact, as far as geography is concerned, tense-aspect, imperative and verbal number suppletion appear

to be sharply distinct from each other, and a in bolder view, they may be described as completely different phenomena altogether.

Wälchli (2006) suggests that we take this discussion even further. Traditionally, suppletion has been defined in a negative way, as an exception to a given pattern, something that does not comply with an established default. However, Wälchli points out that there are, in fact, different kinds of exceptions: negative and positive, which can be thought of a two extreme points on a scale with a lot intermediate cases in between. Negative exceptions are not connected in any way to other exceptions; they are completely random and distributed at random. Positive exceptions can be shown to behave in a one or several consistent ways. Moreover, positive exceptions are essential for linguistic theory since they establish the relationship between different perspectives of analysis and in addition, they limit the scope of applicability of sets of rules. Suppletion as outlined by the four different types presented here emerges as a positive exception. Not only can it be demonstrated to house an array of phenomena which are not necessarily related to each other. Verbal number suppletion, imperative, tense-aspect and non-categorical suppletion can be placed differently on the lexical grammatical scale, with verbal number coming closest to the lexical end, non-categorical coming closest to the grammatical end and imperative and tense-aspect suppletion falling in between. In addition, these types of suppletion are, in fact, different phenomena, with their own characteristics which set them apart from other structural properties described in typology in a positive, rather than in a negative way. Studied on its own right, from a cross-linguistic perspective, suppletion has proven to be a recurrent phenomenon in well delimited grammatical domains. Thus it need not be defined as an irregularity any more but rather as a feature of complexity whereby a lexical solution is chosen for the expression of categories which are highly relevant to the lexical meaning of particular verbs.

Notes

1. I would like to thank the reviewers of this paper, one of which preferred to remain anonymous. Special thanks to Michael Cysouw, second reviewer, for all the work he put in this text. Likewise, my warmest thanks go to the editors too as they certainly showed a lot of patience and determination to put this paper through. In the text below I use the following abbreviations: AOR aorist, DU dual, FUT future, HAB habitual, IMP imperative, IND indicative, INF infinitive, IPFV imperfective, NOM nominalizer, NONSG non-singular, OBJ object,

PERF perfect, PFV perfective, PL plural, PRES present, PROG progressive, PST past, RDP reduplication, REC recent, REM remote, SG singular, SUBJ subject, SUFF suffix, TS thematic suffix, VV version vowel.

2. The term suppletion is likewise used to refer to unpredictable distribution of affixes as for instance, in English *ox-en* 'ox-PL' vs. *boy-s* 'boy-PL'. The use of the plural suffix *-en* cannot be accounted for by any morpho-phonological rules of English and is thus considered an exception. My work is focused on suppletion of stems as illustrated in (1) above, so I shall have little to say about affixal suppletion.
3. The list of reference given here is, of course, not exhaustive. See Veselinova (2006: 1–31) for a detailed overview of the existing literature.
4. Thanks to Östen Dahl for the help with this issue.
5. The total number of languages with non-categorical suppletion is 39. However, in some of them there is more than one verb with this kind of suppletion which is why they are counted in more than one group.
6. In this context, 'non-derived' means non-derived from other verbs. The verb *darovati* is otherwise derived from the noun *dar* 'gift'.
7. Thanks to Maria Koptjevskaja-Tamm for the help with this issue.
8. See also Comrie (2003) on Recipient Person-Number Suppletion in the verb 'Give'.
9. Traditionally, "singular" refers to 'one' and "plural" to 'more than one'. With verbal number, there are languages where the content of these labels differs from the tranditional one. For instance, in Ainu, if quantity is specified by a numeral and it is small such as 'one', 'two', 'three' and sometimes 'four', the singular form of the verb is used. For larger numbers, normally, the plural form is used. This applies to both regular and suppletive verbs.
10. There are closely related languages such as Slave where this generalization does not apply. See Veselinova (2006: 159–160) for discussion.
11. In Wälchli's work in progress, this notion refers to the demonstrable statistical dependency of lexical items within a certain field. For instance, by using a binominal sign test, Wälchli shows that the suppletive verbs according to number appear as dependent on each other rather than as completely independent phenomena; such dependency cannot be shown for other types of suppletion, such as, for example, non-categorical suppletion.
12. The word "injure" is used here as a cover term only. It is to be understood very generally to mean 'affect an object X in a way that destroys it'. It covers verbs such as 'kill', 'hit', 'break', 'cut', 'bite off', 'injure' etc.
13. The sum above is 108, but there are languages where the paradigms of 'come/go' verbs show more than one kind of suppletion.

References

Andronov, M. S.
1980 *The Brahui Language*. Moscow: "Nauka", Central Department of Oriental Literature.

Aronoff, Mark, and Anshen, Frank
1998 Morphology and the lexicon: Lexicalization and productivity. In *Handbook of Morphology*. Andrew Spencer, and Arnold Zwicky (eds.), 237–247. Oxford: Blackwell.

Bittner, Andreas
1996 *Starke „schwache" Verben-schwache „starke" Verben. Deutsche Verbflexion und Natürlichkeit*. (Studien zur deutschen Grammatik 51.) Tübingen: Stauffenburg.

Borg, Albert, and Marie Azzopardi-Alexander
1997 *Maltese*. Routledge: London.

Bybee, Joan
1985 *Morphology*. Amsterdam: Benjamins.

Campbell, Lyle.
1985 *The Pipil Language of El Salvador*. Berlin/New York: Mouton de Gruyter.

Comrie, Bernard
2003 Recipient person suppletion in the verb 'give'. In *Language and Life*: Essays in Memory of Kenneth L. Pike. Mary Ruth Wise, Thomas N. Headland, and Ruth M. Brend (eds.), 265–281. Dallas: The SIL International and The University of Texas at Arlington.

Corbett, Greville G.
2000 *Number*. (Cambridge Textbooks in Linguistics.) Cambridge: Cambridge University Press.

Dahl, Östen
1985 *Tense and Aspect Systems*. Oxford: Blackwell.

Day, Christopher
1973 *The Jacaltec Language*. Bloomington: Indiana University Publications.

Dixon, Robert M. W.
1997 *The Rise and Fall of Languages*. Cambridge: Cambridge University Press.

Dressler, Wolfgang
1985 Suppletion in word-fomation. In *Historical Morphology*, Jasek Fisiak (ed.), 97–112. The Hague: Mouton.

Dryer, Matthew S.
1989 Large linguistic areas and language sampling. *Studies in Language* 13 (2): 257–292.

1992 The Greenbergian word order correlations. *Language* 68 (1): 81–138.

2001 What is Basic Linguistic Theory. <http://wings.buffalo.edu/-linguistics/people/faculty/dryer/dryer/blt>.

Durie, Mark

1986 The grammaticization of number as a verbal category. In *Proceedings of the 12th Annual Meeting of the Berkeley Linguistic Society*. V. Nikifordiou, M. Van Clay, M. Niepokuj, and D. Feder (eds.), 35–70, Berkeley, CA: Berkeley Linguistic Society.

Fertig, David

1998 Suppletion, natural morphology, diagrammaticity. *Linguistics* 36 (6): 1065–1091.

Givón, Talmy, and Southern Ute Tribe

1980 *Ute Reference Grammar*. Ignacio, Colorado: Ute Press.

Hewitt, Brian George

1995 *Georgian: A Structural Reference Grammar*. Amsterdam: Benjamins.

Jeanne, LaVerne, Kenneth Hale, and Paula Pranka

1984 Where is suppletion? Paper presented at the GLOW, 1984.

Joseph, Brian D., and Irene Philipaki-Warburton

1987 *Modern Greek*. London: Croom Helm.

Kimball, Geoffrey D.

1991 *Koasati Grammar*. Lincoln: University of Nebraska Press.

King, Alan R.

1994 *The Basque Language: A Practical Introduction*. Reno: University of Nevada Press.

Macaulay, Monica

1996 *A Grammar of Chalcatongo Mixtec*. Berkeley: University of California Press.

Mayerthaler, Willi

1988 *Morphological Naturalness*. Ann Arbor: Karoma. Translation of *Morphologische Natürlichkeit*, 1981, Wiesbaden: Athenaion.

Mel'čuk, Igor

1994 Suppletion: Toward a logical analysis of the concept. *Studies in Language* 18 (2): 339–410.

Mithun, Marianne

1988 Lexical categories and the evolution of verbal number. In *Theoretical Morphology*, M. Hammond, and M. Noonan (eds.), 211–233. San Diego: Academic Press

Reh, Mechthild

1985 *Die Krongo-Sprache*. Berlin: Reimer.

Rudes, Blair

1980 On the nature of verbal suppletion. *Linguistics* 18: 655–676.

Stolz, Thomas, and Ljuba Veselinova
2005 Ordinal numerals. In *World Atlas of Language Structures*. Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 218–221. Oxford: Oxford University Press.
van der Auwera, Johan, and Ludo Lejeune (with P. Umarani and V. Goussev)
2005 The morphological imperative. In *World Atlas of Language Structures*. Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 286–289. Oxford: Oxford University Press.
Veselinova, Ljuba
2005a Suppletion according to tense and aspect categories. In *World Atlas of Language Structures*. Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 322–325. Oxford: Oxford Uni-versity Press.
2005b Verbal number and suppletion. In *World Atlas of Language Structures*. Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 326–329. Oxford: Oxford University Press.
2006 *Suppletion in Verb Paradigm: Bits and Pieces of a Puzzle*. Amsterdam: Benjamins.
Wälchli, Bernhard
2006 Can typology explain the irregularity of motion verbs? Ms.
Wurzel, Wolfgang U.
1990 Gedanken zu Suppletion und Natürlichkeit. *Zeitschrift für Phonetik, Sprachwissenschaft und Kommunikationsforschung* 43: 86–91.

Lexical classes: A functional approach to "word formation"

Bernhard Wälchli

1. Introduction

This paper presents a functional approach to *derivation* and *composition*, which are traditionally treated as *word formation* in morphology, inseparably tied to the notion of word.[1] In this paper I argue that the cross-linguistic domains which tend to be expressed by derivation and composition are not restricted to the realm of word, which is why the term word formation is misleading from a functional perspective. Instead, I propose to use *lexical class* as a cover term for derivational and compositional categories. Lexical classes are to be understood in analogy to grammatical classes or grams, such as future tense or definiteness, for which it is well known that they can be expressed analytically (=syntactically; English ***will*** *work*, ***the*** *job*) or synthetically (=morphologically; French *travailler-**a***, Swedish *jobb-**et***). Lexical classes are not to be confounded with word classes (also called parts of speech or lexical categories), which are not treated here. The aim of the paper is to explore the nature of lexical classes in a cross-linguistic perspective by focusing on two quite different lexical class types, co-compounds and "light 'again'". While in the approach taken here the goal is to group together categories that are cross-linguistically equivalent in function, it is not denied that a cross-linguistic grouping according to similarity in form can be equally useful. However, due to cross-linguistic incongruence of form and meaning the two approaches will result in fundamentally different typologies. A typology of compounds or derivational categories cannot be form-oriented and function-oriented at the same time.

Co-compounds (also known as dvandva, copulative compounds, or pair words; see Wälchli 2005 for a detailed discussion) are word-like tight units consisting of two parts (or in rare cases, more than two parts) which express *natural coordination* (coordination of things or events that often occur together) with characteristic lexical domains including pairs of relatives (Rural Tok Pisin *papa-mama* 'father-mother' > 'parents', *brata-susa* 'brother-sister' > 'siblings'), body parts (*han-lek* 'hand-foot' > 'limbs'), clothes (*su-soken* 'shoe-sock' > 'footwear'), and collectives and abstract

notions (*rit-rait* 'reading-writing' > 'skills learnt at school'); Rural Tok Pisin examples from Mühlhäusler (1979: 377). For a detailed discussion of natural coordination see Wälchli (2005: 5–13, Ch. 2, and passim). Formally, co-compounds are tight or "word-like" units (they usually lack overt markers of conjunction), but in few languages co-compounds are words as, for example, in Modern Greek and Classical Sanskrit. Usually co-compounds are intermediate between words and phrases, which is graphically represented in many orthographies by hyphenation.[2] The formal patterns of co-compounds are subject to considerable cross-linguistic and also language-internal variation. In Erzya Mordvin, usually both parts of a co-compound are inflected: *t'et'a-zo=ava-zo* 'father-his/her=mother-his/her' > 'his/her parents', but in a few cases only the second part is inflected (*ul'i=paro-zo* 'exists=good-his/her' > 'his/her belongings'). In a number of languages of different areas there are also discontinuous co-compounds, where the parts of the co-compound are interrupted by an element that is usually repeated according to the formula C**A**C**B** or **A**C**B**C, as in Hmong Daw *kuv lub* ***teb*** *lub* ***chaw*** 'I CL **land** CL **land**' > 'my land' (see Wälchli 2005: 102, 147, 228, 231, 238–239 for further examples from Hmong Daw, Sgaw Karen, Khasi, Coatlán Mixe, and Toaripi). Note that the Mordvin example also corresponds to the formula ACBC, the only difference being that C is a bound morpheme and not a word.

Co-compounds have a wide range of particular uses in different languages (see Wälchli 2005, Ch. 5), and the meaning of the whole is not always predictable from the meaning of the parts, which is why co-compounds are best studied in texts. Example (1) is from an original text from Arapesh, where this point can be illustrated. Many languages of New Guinea have a co-compound consisting of the parts 'pig' and 'dog' meaning '(domestic) animals'. In (1) it has, however, the metaphorical meaning 'ordinary people' (as opposed to government councillors).[3]

(1) Arapesh (Torricelli, Kombio-Arapesh; Conrad and Wogiga 1991: 185)

...o	*apak*	***buwul***	***nubat.***	*m-a-kli*	*orait*
and	we:PL	**pig**	**dog**	1PL-REAL-say	OK

...and we "ordinary people", we said "OK"...

Example (2) is from a translated text, the Gospel according to Mark (henceforth: Mark), where the potential source texts (Spanish, Latin, Greek) do not have any co-compounds. Translations usually have a rather different distribution of co-compounds than the original, which shows their independence from the original in this respect and thus makes them a useful

source of material for comparing frequency levels of co-compounds cross-linguistically.

(2) Coatlán Mixe (Mixe-Zoque; Mark 15:52)
...e *y-quecytzög-y* ***nï-huädz*** ***ix-huädz***
and 3SG-flee-PFV **shirt-without** **trousers-without**
'...he fled naked'

The second lexical class type to be discussed, *light 'again'*, belongs to the domain of preceded events. In Wälchli (2006), I explored the typology of 'again' expressions – known in the literature by many different names, such as repetitive, iterative, regressive, reversionary, etc. – in a sample of 100 languages and distinguished two types, "heavy 'again'" (e.g., English *again*) and "light 'again'" (e.g., English *re*), defined by their different cross-linguistic distributional properties. Heavy 'again' expressions have overt translational equivalents in most languages; light 'again' expressions often lack an overt translational equivalent in many languages. For semantic differences see Wälchli (2006: 74–78). While there is a cross-linguistic tendency for heavy 'again' markers to be analytic and light 'again' markers to be synthetic as in English, this is no cross-linguistic universal. In Amuesha (Arawakan), both heavy (V-*err-err*) and light 'again' (V-*err*) are synthetic; in Chiquito (isolate), both heavy (V *tatito*) and light 'again' (V *tato*) are analytic. In some languages, the heavy and the light domain are expressed by the same form. Central Tarahumara (not included in the sample of my earlier study) has an analytic 'again' expression used both in the heavy and in the light domain. In Tarahumara, *cu* 'again' is used much more often than English *again* both in translations (Mark) and original texts (e.g., the story given in Cohen 1998: 350–354). The light domain is illustrated in (3) from the initial part of a story where there is no previous mention of carrying corn or carrying anything else. Thus, rendering Tarahumara *cu* by an overt 'again' expression in the English translation would be odd.

(3) Tarahumara (Uto-Aztecan, Tarahumaran; Cohen 1998: 350)
Sunú *apé-ma-ni* ***cu*** *ripáami*
corn carry-IRR-1SG:NOM **again** up:there
'I am going to bring corn from up there.'

In Lezgian, the so-called Repetitive[4] (Haspelmath 1993: 174), covering both light and heavy 'again' functions, has both synthetic and analytic forms and a verb usually takes either of the two. Sometimes, however, it is

marked twice as in (4). The analytic forms are constructed by means of *qʰuwun* 'do again', a Repetitive form of the auxiliary verb *awun* 'do'.

(4) Lezgian (Nakh-Daghestanian, Lezgic; Mark 15:29)
... pud jiq̃a-n q̃ene e<x>cig qʰ-iji-daj-di
three day.OBL-GEN within <RE>build RE-do-PST.FUT-NOML
'[Ah, thou that destroyest the temple,] and buildest it in three days.'

In Section 2, the notion of class, and more particularly functional-formal class, is discussed. Section 3 focuses on co-compounds and illustrates in which way typology can show that lexical classes are real. Section 4 focuses on light 'again' and discusses characteristic distributional properties of three types of functional-formal class, viz. lexical classes, grammatical classes, and heavy classes. The types of classes roughly correspond to inflection, derivation/composition, and function words, but are defined by distributional rather than by formal criteria.

2. Classes and their relevance

A class is the extension of forms sharing characteristic properties. Forms can be synthetic (morphological) or analytic (syntactic) and are elements of a class by virtue of their class properties. Forms differ as to the lexical hosts they have. Forms of a class with an identical host are a type of that class and can be counted in texts as tokens. Depending on the nature of the class properties, classes can be characterized as formal, functional, and functional-formal.

Reduplication, however defined, is a predominantly a formal class. It is possible that all reduplications in all languages also share certain functional properties, but it is defined as a formal class to start with (but see Stolz, forthcoming). Functional domains, as the term is currently used in typology (see Miestamo, this volume), are predominantly functional classes, even if they also have restricting formal components (Haspelmath 1997: 9). Predicative possession, e.g., is the domain of possession (functional) to the extent that it is expressed in predicative constructions (formal). The English Past tense is a functional-formal class, its class properties are a set of formal characteristics, differing for strong and weak verbs, and a set of semantically related functions and constructions where it is used. Functional-formal classes expressing grammatical categories are called grammatical

classes here, irrespective of whether their forms are synthetic (English Past *went*, *wrote*, *worked*) or analytic (English Future *will write*, *will work*). This corresponds to Bybee and Dahl's (1989) term grammatical morpheme (or shorter gram).

The number of imaginable classes for any language, if not infinite, is very high and linguists tacitly agree that we need a way to restrict our attention to some classes. Put differently, only a subset of all imaginable classes is real. Some linguists believe that real means essential, suggesting that intuition or linguistic theory tells us which classes are real. Like Altmann and Lehfeld (1973: 20–22) I do not share this essentialist optimism. Rather, I hold that classes differ mainly in salience, applicability, and relevance. Classes are real to the extent that they are relevant for explaining recurrent patterns identified in linguistic data. Salience is a heuristic criterion. Relevant categories must be salient; otherwise languages would not be learnable and could not be investigated. But not all salient classes are relevant. Applicable means that there must be unequivocal criteria to approximate the extension of a class. This does not mean that classes must be definable by classical Aristotelian definitions; classes can also come in clusters with family resemblance or clusters of subclasses where it may be difficult to tell which ones are more real, the superordinate classes or their subclasses.[5]

In linguistics we usually start with given classes, which is nothing else than a hypothesis that a certain class with a set of salient class markers is relevant. However, it must then be shown that the class is also relevant in a cross-linguistic perspective. A clear example is suppletion where it has been assumed until now that this is a coherent phenomenon. However, Veselinova (this volume) shows that this is not the case.

Typology is crucial in this approach because it can investigate to what extent given classes are salient, applicable and relevant across a data sample from all languages of the world. This rests on the assumption that relevant classes are cross-linguistically recurrent or, put differently, that by investigating cross-linguistic class types the relevance of language-particular class types can be shown. Classes are relevant cross-linguistically to the extent that cross-linguistic variation is significantly different from random distribution and/or there is cross-linguistic systematicity which calls for explanation. Class types are applicable cross-linguistically to the extent that their extension can be unequivocally determined or at least roughly estimated for data sets from all or most languages of a sample by the same criteria. Relevant and applicable cross-linguistic class types are not always compatible with traditional linguistic concepts. This is how

typological research has direct consequences for linguistic theory. The classes on which traditional linguistic theory rests are often given classes which are salient and have proven to be useful for descriptive purposes in some particular languages, but for which it has not always been proven yet that they are also universally applicable and universally relevant.

In this paper, three types of functional-formal class are discussed, viz. grammatical, lexical, and heavy classes (Table 1), which differ, among other things, in their distributional properties. Grammatical classes usually have a high token frequency and their hosts have high type frequency; they do not strongly collocate with their hosts. In Bybee's (1985) terminology, grammatical classes have a high degree of generality and a rather low degree of relevance. Lexical classes can have an equally high token frequency as grammatical classes, but they tend to collocate strongly and idiosyncratically with particular lexical hosts. Heavy classes do not strongly collocate with particular lexemes and neither do they have high token frequencies, which is why they are more emphatic than grammatical and lexical classes which are both light classes.[6] Degree of emphasis correlates with frequency. Less frequent elements tend to have a higher information value than highly frequent elements. Emphasis, as understood here, is also a cross-linguistic notion. Emphatic expressions will usually translate into overt expressions in most other languages, while non-emphatic expressions are usually not translated whenever a language lacks the corresponding class. In the domain of past, *yesterday* V (where V is a predicate serving as lexical host) is a heavy class and the English Past is a light class. As can be seen from this example, related heavy and light classes are not identical in meaning, light classes are usually broader in meaning and heavy classes are more specific (more informative).

Table 1. A model of functional-formal classes

	Cross-linguistic occurrence restricted		Occurrence universal
General	*Grammatical classes*	*LIGHT CLASSES*	*HEAVY CLASSES*
Lexically relevant	*Lexical classes*		

Co-compounds are a light lexical class and phrasal coordination is a heavy class. Light 'again', such as English *re*-V, is a lexical class, English *again* V is a heavy class. This typology does not exclude the possibility of mixed classes. In some languages, like Lezgian and Tarahumara, 'again' expressions can be used in the heavy and light domain at the same time. An

example for a mixed grammatical and heavy class would be a demonstrative that is used as a definite article at the same time.

Light classes sometimes develop from corresponding heavy classes diachronically by inflationary processes (rhetorical devaluation, Dahl 2004: 121). Even if the light and heavy distinction is gradual rather than a strict dichotomy, we can speak of heavy classes wherever a class usually has overt translational equivalents in other languages and of a light class wherever a class often lacks overt translational equivalents in other languages.

The traditional model of morphology (Figure 1), forcing everything into the Procrustean bed of word, is equally inadequate for lexical and grammatical classes. As we have seen above, both can have both synthetic and analytic form.

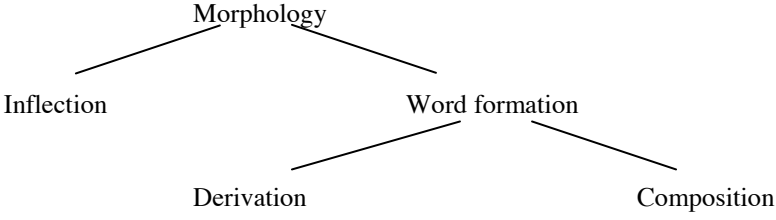


Figure 1. Traditional morphology

However, even if grammatical classes (inflection) and lexical classes (word formation) have the "problem" in common that they cannot be treated exhaustively within morphology, inflectional categories are in a more privileged position since (a) there is a long tradition in descriptive linguistics of simply ignoring that inflection should be restricted by definition to morphology and (b) there are theoretical approaches that recognize the similarity of analytic and synthetic grammatical forms. In Bybee's (1985) theory of morphology (Figure 2), degree of fusion is viewed as a continuum rather than a binary division between word and phrase.

Lexical – Derivational – Inflectional – Free grammatical – Syntatic/Periphrastic

◄

High degree of fusion	Low degree of fusion
High degree of relevance	Low degree of relevance

Figure 2. Continuum of expressions for complex semantic units (Bybee 1985: 12)

However, like traditional morphology, Bybee (1985) still restricts derivation to strongly fused form. Her model is certainly right to the extent that

derivational classes tend to be more strongly fused than grammatical classes, but this is not universally true. Using parallel texts taken from a world-wide convenience sample of 100 languages, I found that the heavy vs. light 'again' distinction correlates with the analytic-synthetic distinction, but only to a certain extent (Wälchli 2006). In the 100 language sample heavy 'again' was expressed exclusively analytically in 81 languages and exclusively morphologically only in 8 languages (Ewe, Garo, Navajo, Paumarí, among others), the 11 remaining languages having mixed or intermediate constructions. Among the 21 languages of the 100 where light 'again' could be clearly identified, 15 had morphological exponents and only 3 exclusively periphrastic constructions (Lahu, Vietnamese, and Chiquito), with 3 languages having mixed or intermediate constructions (Lezgian, Mansi, Warlpiri).

Correlation between function and degree of fusion does not mean identity. Therefore we need a model of functional-formal classes that completely abstracts away from the degree of fusion (Table 1), so that analytic derivational and compositional classes are not excluded by definition. The classification offered in Table 1 is simplistic and premature, and calls for elaboration. However, the crucial point is that it is based on distributional rather than formal properties of classes. It is assumed here that these cluster mainly to three types of classes (grammatical, lexical, and heavy), which might turn out to be too simple as soon as the distributional properties of classes are better understood. This is further discussed in Section 4.

3. Co-compounds as a functional-formal class type

Above I have characterized co-compounds as a lexical class type in particular and as a functional-formal class type in more general terms by adducing formal (consisting usually of two units, word-like, tight), semantic (expressing natural coordination), and distributional (occurring in characteristic lexical domains, notably with pairs of relatives, body parts etc.) class properties at the same time. This approach is in conflict with the traditional approach in morphology where coordinate compounds are viewed as a third order class. This traditional approach – word (formal class) > compound (formal subclass) > coordinate compound (semantic subclass) – as simple as it might seem at first glance, is problematic in many respects. I will argue here that it is not appropriate because it is (a) not cross-linguistically

applicable and (b) not cross-linguistically relevant or at least less relevant than the lexical class approach:[7]

- To posit formal classes as sub- or superclasses for functional classes and vice versa is problematic because there is no form-function isomorphism across languages. Languages differ considerably in what is packed into synthetic structures and phrasal structures. It is true that it is not completely arbitrary what is in a word and what is in a phrase, as shown by Bybee (1985). But word, defined as a formal class, has no neat semantic equivalent. Terms like inflectional class or derivational class do not make sense semantically if they rest on the formal notion of word.
- The notion of word is a very useful descriptive category and, in some way or other, applicable to all languages. However, it has a fuzzy border. For some forms, the various criteria for wordhood do not match. Even alphabetic orthographies, which are notoriously categorical about words, sometimes recognize intermediate forms by hyphenation. While this fuzzy border itself is not a major problem for the core of words, some complex word forms, and notably compounds (consider the traditional problematic definition of compounds as words consisting of words) are completely or mostly in the fuzzy zone. This makes the notion of compound that rests on the notion of word difficult to apply even for many particular languages.
- The formal separation at the word level is arbitrary. Words and word-like structures are more similar than phrasal word-like structures and sentences even with respect to degree of fusion.

However, from a typological point of view it matters most which formal properties of possible classes match best with semantic and distributional properties cross-linguistically, so that a clear cross-linguistic class type emerges. I will show now in a very small and specific set of cross-linguistic data that co-compounds have a characteristic distribution of use cross-linguistically.

The distribution of co-compounds is considered in a genealogically almost unbiased sample of 41 languages in 18 passages from parallel texts (Mark). Translations are often stigmatized in linguistics as being unreliable data and it is certainly true that there are many problems with translation in general and Bible translations more particularly (see, e.g., the papers in Cysouw and Wälchli 2007 for discussion). In this particular case, the source languages, Classical Greek and other European languages, do not have any co-compounds, which is why the occurrence of co-compounds

cannot be due to translation effects. Moreover, co-compounds also occur in original texts of the same languages where they occur in translations, as far as this could be checked (see Wälchli 2005, Ch. 6). The advantage of parallel texts is that language use can be directly compared across languages on the level of contextually-embedded passages; put differently, the distribution of semantics across the texts is largely identical.

From a large amount of possible passages (Mark has around 15,000 graphemic words in the English King James version) such passages are selected where it is known that co-compounds have a high probability to occur, e.g., *night and day*, *parents*, *father and mother*,[8] *children*. If co-compounds were distributed randomly, it would be absurd to select 18 passages from 15,000 possible passages to find out whether co-compounds exist in a corpus. However, the results given in Table 2 show that we find some co-compound-like patterns in 24 of the 41 languages (actually it would have been sufficient to consider only 5 of the 18 passages). Since we want to investigate distribution here, we cannot start by defining co-compounds based on distributional properties. This is why co-compounds are defined here as any structures consisting of two lexical elements with a semantically coordinating relationship between them, different from the pattern or patterns of ordinary phrasal coordination. It happens to be the case that all co-compounds identified in the 41 languages are different formally from phrasal coordination by lack of overt coordinators and/or (graphically) commas. Put differently, defining co-compounds as any tight structure, formally different from phrasal coordination, is applicable to all languages here. Even if there should be languages where there is a formal syncretism between co-compounds and phrasal coordination,[9] this could be detected later on the basis of a distribution which covers domains usually expressed exclusively by co-compounds and by phrasal coordination. Here, the constructions of phrasal coordination also occur in the domain, but exclusively in 6 of the 18 passages. Put differently, the domain of co-compounds can be divided into two parts, one which is a potential domain also for phrasal coordination and one where phrasal coordination does not occur.[10]

Table 2. Distribution of co-compounds (=) and phrasal coordination (&)

	5:5 'night & day'	13:12 'parents'	5:40 'father & mother'	6:31 'come & go'	11:15 'sell & buy'	2:16 'eat (& drink)'	7:28 'children'	10:29 'sisters'	10:30 'fields'	10:22 'properties'	7:8 'customs'	7:3 'ancestors'	12:20 'brothers'	13:16 'clothes'	1:19 'repair'	14:48 'thief'	14:65 'face'	8:6 'people'	Co-compounds	Phr. coord. and co-c.	Co-c. in light domain
Mordvin (Erzya)	=	=	=	&	&	=	=	=		=	=	=	=		=	=			12	14	8
Chuvash	=	=	=	=	=		=		=					=	=	=			10	10	5
Kâte	=	=	=		=		=	=	=	=			=	=					10	10	6
Hmong Njua	=	=	&		=		=	=	=	=		=	=	=					9	10	6
Daga	=	=	=	&			=	=	=	=								=	6	7	3
Sora	=	=	=	=	&	=					=								6	7	1
Avar	&	=	=		=	=		=	=										6	7	2
Basque	&	=	=	=	=												=		5	6	1
Mixtec (S.Mig.)	=		=	=	=	=													5	5	0
Adyghe	=	=	=	=	=														5	5	0
Mixe (Coatlán)	=		&	=	=	=													4	5	0
Mizo	=	&	&		&	=						=							3	6	1
Kala Lagaw Ya	=	=	=																3	3	0
Tamil	&		&	&	&				=		=								2	6	2
Yareba	&	&	&	&			=			=									2	6	2
Toaripi	&	=	&		&		=												2	5	1
Georgian	&		=	=	&														2	4	0
Quechua (Imb.)	&	=	=																2	3	0
Hopi	&		&		&			=											1	4	1
Amuesha	=	&	&	&	&														1	5	0
Haitian Creole	&	&	&	=	&														1	4	0
Pitjantjatjara	=		&		&	&													1	4	0
Miskito	&	&	&	=	&														1	5	0
Shipibo-Konibo	=		&	&															1	3	0
Maltese	&	&	&	&	&	&													0	6	0
Kiwai	&	&	&		&	&													0	5	0
Ewe	&		&	&	&	&													0	5	0
Choctaw	&	&	&		&	&													0	5	0
Dakota	&		&	&	&	&													0	5	0
Yucatec	&		&	&	&	&													0	5	0
Khoekhoe	&		&	&	&	&													0	5	0
Purépecha	&		&	&	&	&													0	5	0
Greek (Class.)	&		&	&	&	(&)													0	4	0
Hausa	&		&	&	&														0	4	0
Koyra Chiini	&		&		&	&													0	4	0
Swahili	&		&	&	&														0	4	0
Guaraní	&		&	&															0	3	0
Samoan	&		&			&													0	3	0
Navajo	&		&		&														0	3	0
Cheyenne	&	&	&																0	3	0
Acholi	&		&	&															0	3	0
Co-compounds	14	12	12	9	8	6	6	5	5	5	3	3	3	3	2	2	1	1			
PhrCoord./C-c	41	21	41	26	32	18	6	5	5	5	3	3	3	3	2	2	1	1			
Phrasal coord.	27	9	29	17	24	11	0	0	0	0	0	0	0	0	0	0	0	0			

Areas with moderately and highly co-compounding languages are Central Eurasia, continental East and South East Asia, New Guinea, and Mesoamerica. This characteristic areal distribution is another aspect of the cross-linguistic relevance of the class type co-compounds, but cannot be further discussed here (see Wälchli 2005, Ch. 6). The domain is chosen here in a way that it does not reflect any differences between moderately and highly co-compounding languages. In Erzya Mordvin the 12 tokens are 12 out of less than fifty in the whole text and in Vietnamese (see Table 3) they are 12 out of more than 300 in the whole text (see Wälchli 2005: 192).

The distribution across passages is not random. In Table 2 the passages are ordered according to the frequency of co-compounds. Interestingly, co-compounds are most likely to occur in some contexts where many languages without co-compounds have phrasal coordination. (But co-compounds are not at all expected to occur in all passages where phrasal coordination usually occurs; the domain just happens to be chosen in a way that only natural coordination passages favourable for co-compounds were taken). In Table 2 almost two thirds of the tokens of co-compounds appear in phrasal coordination passages. However, this does not mean that co-compounds generally occur more often in the phrasal coordination domain. Especially in languages with a moderate and high frequency of co-compounds, the vast majority of tokens occur in passages where there is never a phrasal coordination translational equivalent. However, co-compounds happen to be distributed more idiosyncratically in that part of their typical domain where no phrasal coordination translation equivalents are found, and here I have chosen mostly such passages where co-compounds are to be expected to occur recurrently across languages.

In most cases, the correlation between pairs of passages is weak. Put differently, a single particular co-compound is a weak predicting factor for a co-compound in a single particular other passage.[11] However, when the passages are considered together it becomes apparent that some passages tend to be expressed by co-compounds in all co-compounding languages and some other passages tend to be expressed by co-compounds only in moderately or highly co-compounding languages. Another way to put this is that co-compounds have characteristic semantic profiles according to the relative frequency of co-compounds (Wälchli 2005: 194).

The fact that the most strongly co-compound-attracting passages are often also encoded by phrasal coordination shows that phrasal coordination and co-compounds are tightly connected. It is widely held that co-compounds in many languages developed from phrasal coordination even if

this is difficult to prove by the historical method (Wälchli 2005: 245–251). Here we have a distributional argument for the close relationship between the two class types.

In Figure 3, the observed distribution of number of co-compounds per language in the 41 language sample is compared to a random distribution with the same overall probability of occurrence of co-compounds (assuming that the expected random distribution would be binomial, see Wälchli 2006 and Cysouw 2002). The observed distribution is bimodal and significantly different from a binomial distribution, which means that the occurrence of co-compounds in particular passages in particular languages is not independent of their occurrence in other passages in the same language. A high total frequency of co-compounds raises the chance that a particular passage is expressed by a co-compound and, conversely, a low total frequency lowers the chance that a particular passage is expressed by a co-compound. This is exactly what makes co-compounds a relevant class. Put differently, a language that has a lot of feature F is more likely to have F in context C than a language with little or no F, if F is a relevant class and C is affected by it. Thus, the presence of particular co-compounds is relevant for the existence of other co-compounds in the same language; otherwise the cross-linguistic distribution would not be bimodal.

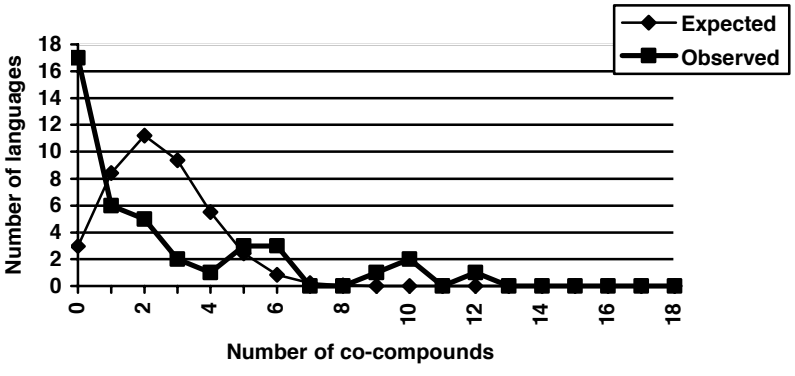


Figure 3. Number of co-compounds per text in the domain

Having proven the relevance of co-compounds does not mean that we have identified the only right way to define them. While it is possible to determine already on the basis of as little material as discussed here that some languages, such as Erzya Mordvin, Kâte, and Hmong Njua have co-compounds, for some other languages of the sample, the result is not con-

clusive. One possibility is to take only the languages from the high value pole in Figure 3 (i.e., more than 4 co-compounds). However, this still does not assure that co-compounds also occur in the co-compound domain proper where phrasal coordination does not occur. Another possibility is to count only languages where there is evidence for co-compounds from the non-phrasal domain. Indeed, it would be equally difficult to decide with a similar amount of data whether a language has definite articles or only demonstrative pronouns and the situation we face here is exactly the same. The class character of co-compounds emerges the more clearly the more text passages in a language are considered. If we take into account the Coatlán Mixe example (2) above along with some other examples from the Mixe text, it is already clear that Mixe has a class of co-compounds. From the consideration of original texts I am further convinced that Toaripi and Georgian have well-established classes of co-compounds. For other languages, where I do not have access to such additional material (San Miguel el Grande Mixtec, Kala Lagaw Ya, Hopi) I am not in a position to make any final decision. Moreover, it cannot be known on the basis of the evidence presented here whether all the languages with value zero completely lack co-compounds. Negative evidence is a notoriously problematic issue in typology. However, there is good reason to assume that languages like Acholi and Samoan lack co-compounds or at least have a significantly low frequency of co-compounding, and what we see here is better negative evidence than if we have a reference grammar which does not mention co-compounds.[12]

Let us now consider the formal patterns of co-compounds more closely. In Table 3, some languages from Table 2 are repeated together with some additional data from more co-compounding languages. Co-compounds are classified formally according to very rough graphemic criteria without any detailed consideration of what is the exact structural (prosodic/morphological/syntactic) equivalent of different graphemic representations, simply because we know for sure for some languages (Erzya Mordvin, Chuvash, Vietnamese, Mandarin) that there are usually real differences in form corresponding to graphemic differences. Co-compounds are classified according to whether they are fully fused with some reduction of parts (*), graphically univerbated single words (x), hyphenated (=), graphically analytic sequences (#), or discontinuous (//). It is possible that a thorough investigation of the prosodic phonology of each language would yield clearer criteria to identify the prosodic constituents involved, but it is very likely that the result would not be significantly different from what mere orthography can

give us. Table 3 illustrates that intermediate and looser formal structures (= and #) are highly dominant while univerbation is rare (even if the Mandarin co-compounds are counted as univerbated). The differences in form reflect the profile of the domain to a certain extent. The domain shared with phrasal coordination has a certain propensity to exhibit looser patterns where there is a difference, for example, in Vietnamese. Full univerbation and especially reduction, however, concentrate to instances of lexicalization, which are distributed rather idiosyncratically across the domain ('child' in Mordvin, 'clothes' in Chuvash, 'face' and 'parents' in Basque, 'people' in Daga). It has to be added that some of these univerbated forms have an exceptionally high token frequency, which is another indicator of their lexicalization. For some of these lexicalized co-compounds, it is doubtful whether they are still analysable into parts (Erzya Mordvin *ej-kakš* < *ejde + kakš* 'child-child') and whether they still belong to a class of co-compounds synchronically. We can therefore conclude that it is not characteristic of co-compounds to be univerbated. Rather fully univerbated (strictly morphological) co-compounds tend to be already on the move out of the class of co-compounds.

Table 3. Formal patterns of co-compounds in 18 passages in Mark

	5:5 'night and day'	13:12 'parents'	5:40 'father and mother'	6:31 'come and go'	11:15 'sell and buy'	2:16 'eat (and drink)'	10:29 'sisters'	7:28 'children'	10:30 'fields'	10:22 'properties'	7:8 'customs'	7:3 'ancestors'	12:20 'brothers'	13:16 'clothes'	1:19 'repair'	14:48 'thief'	14:65 'face'	8:6 'people'	Co-compounds
Erzya Mordvin	=	=	=			=	=	[*]		x	=	=	=		=	=			12
Vietnamese	#	#	#	//	=		#	=	=		=		#	=		=			12
Mandarin	[x]	[x]	[x]	[x]	[x]		[x]	[*]	[x]	[x]	[x]		[x]						11
Chuvash	=	=	=	=	=			=	=					[x]	=	=			10
Hmong Njua	//	#			//		//		#	#		//	[x]	#					9
Tajik	#	#	#	#	[x]	#				#									7
Daga	#	#	#					[x]		#								#	6
Avar		=	=		=	=	=		=										6
Khasi		//		#	#	//	#					#							6
Malay		[x]	#		=						=	#	=						6
Basque		[*]	=	=	[x]												[*]		5
Kala Lagaw Ya	#	=	#																3
Tok Pisin		[x]		#														[x]	3

We can conclude that it would not be useful to define co-compounds in a cross-linguistic perspective as words. First, because the notion of word is

not clearly applicable in its fuzzy border area in which compounds are located in most languages and, second, because this arbitrarily separates closely related patterns (real word and only word-like) from each other which can be shown to be directly relevant to each other.

4. Type-token diagrams of functional-formal classes

A starting point for the discussion of similarities and differences between grammatical and lexical classes is the discussion of distinctive properties between inflection and derivation in the literature, even though this is usually restricted to morphology and sometimes excluding compounding. Two rather different approaches are manifested by Plank (1994), on the one hand, who discusses as many as 28 relevant properties, and Bybee (1985: 81), who holds that positing a single criterion – obligatoriness – is the most successful solution. However, these two and virtually all other approaches have in common that they focus on grammatical phenomena, their primary interest being to delimit grammatical categories from all other phenomena, which is why "characteristic" features of derivational categories are often negative (e.g., lack of obligatoriness). Moreover, many criteria are couched in modal terms (e.g., obligatoriness) rather than phenomenological; they state what a category must, can or cannot do rather than stating what it does in real language use.

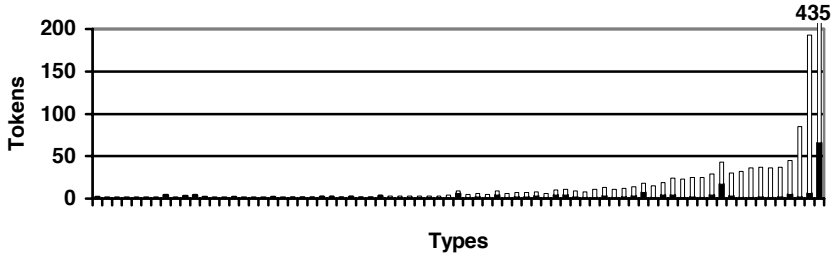


Figure 4. Type-token diagram of Clause negation in Latvian (*ne-*) in Mark

Grammatical categories are better describable in modal terms, due to their syntactic (and/or pragmatic) relevance. Grammatical classes are obligatory in certain slots in syntactic constructions, are associated with particular word classes, are often agreement targets or agreement triggers, and cluster in paradigms. In this section, however, we will consider some

phenomenological properties instead – such as they can be identified in corpora – which can be summarized under the heading of *type-token profile*, notably *token frequency* (how often a certain class is expressed in a text), *type frequency* (with how many different lexical hosts the marker of the class combines), and the total token frequency of the types affected by the class (*token range*). I will concentrate here on light and heavy 'again' and some other predominantly verbal heavy, lexical, and grammatical classes.

Figure 4 shows the type-token diagram of Clause negation in Latvian (*ne-*) in Mark. Latvian has been chosen for convenience; the type-token profile for clause negation looks very similar for all languages, given that clause negation is a heavy class with a high degree of cross-linguistic sharpness; that is, clause negation is used more or less in the same contexts cross-linguistically. Mark is chosen as text for all diagrams in this section, because choosing a translation of the same text for all languages as corpus makes it possible to compare the values directly across languages. Corpus linguistics has developed tools to deal with different corpus size (see, e.g., Gaeta and Ricca 2002), but let us keep things simple here for illustrational purposes.

In the diagrams, the horizontal axis shows the individual types of hosts (verbal lexemes) combined with negation in the text. Only affected types are shown; that is, only those verbs which occur at least once in the text with negation. The vertical axis shows the number of all tokens of the affected types. Affected tokens (negative forms) are shown in black, non-affected tokens (affirmative forms) are marked white. The types are ordered according to the number of non-affected (white) tokens per type. Note that the total token frequency of a type correlates quite well with the frequency of non-affected tokens of a type.

There is only one verb in the text that occurs clearly more often in negatives than in affirmatives: *saprast* 'understand' (i.e., negation is *locally unmarked*, the marked value is more frequent than the unmarked one; see Tiersma 1982, Wälchli 2005: 40–44, 118–120). It occurs six times in the negative and three times in the affirmative. 'Understand' and 'know' are verbs collocating with negation, and it is no coincidence that some languages have lexicalized forms for 'not know', such as Latin *ignorare*. Latvian *zināt* 'know', though, happens to occur less often (7 against 11) in the text under consideration. The number of types exhibiting clear collocation with a class is a relevant feature for that class and one way to measure it is to count the number of types with *local unmarkedness*, which I define here

as more affected (black) than non-affected (white) tokens with a minimum of five affected tokens. That clause negation is no lexical class is visible most clearly from the high proportion of white, non-affected, tokens. The *albedo* ("whiteness"),[13] calculated as the ratio between non-affected tokens and token range, is 0.84. Put differently, negation is very weakly sensitive to the choice of lexical elements. In Bybee's terminology it has a high degree of generality and a rather low degree of relevance. While it is clear that Clause negation is no lexical class, it is less clear whether it is a heavy class or a grammatical class. Probably, clause negation is exceptional in being a heavy class with grammatical class properties at the same time. Negation is expressed in all languages and hardly ever implicit, but it has an unusually high token frequency for a heavy class. Heavy classes, while having a high albedo (little lexical relevance) tend to occur much more rarely than grammatical classes. Consider Figure 5 for English *again* as an example for heavy 'again', for a typical type-token diagram for a heavy class.

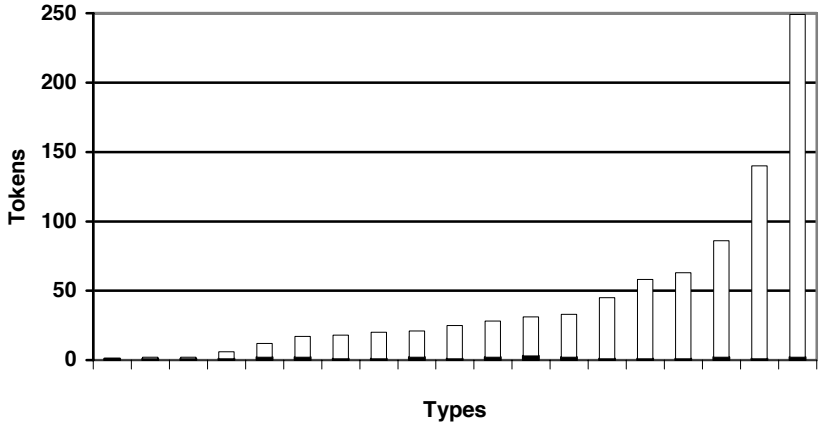


Figure 5. Type-token diagram of English *again* in Mark

Table 4. Type-token diagram values of some heavy, grammatical and lexical classes (in Mark)

	Type of class	Type freq.	Token freq.	Token range	Albedo	Locally umarked types
English *re-*	lexical	14	40	54	.26	2
Spanish *re-*	lexical	19	101	246	.31	4
French *re/ré-*	lexical	51	265	508	.48	12
Middle: Russian *-sja/-s'*	lexical	117	263	515	.49	10
Latin *re(d)-*	lexical	22	103	329	.69	2
Reflexive: Russian *sebja*	heavy	3	4	17	.80	-
Negation: Latvian *ne-*	gram./h.	75	228	1433	.84	1
Future: Latvian	gram.	74	161	1564	.90	-
Causative: French *faire* V	heavy	17	19	222	.91	-
Lezgian Repetitive	lx./heavy	21	98	1280	.92	1
English *again*	heavy	19	29	922	.97	-

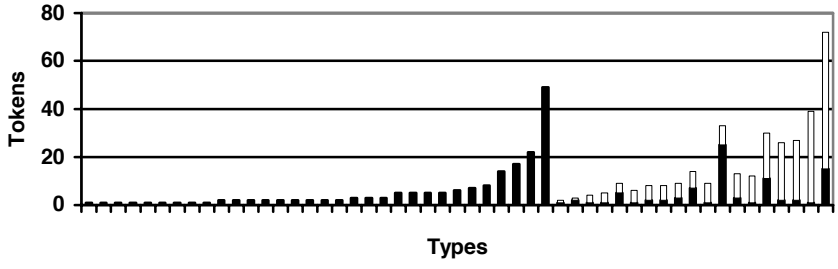


Figure 6. Type-token diagram of French *ré-/r(e)-* in Mark

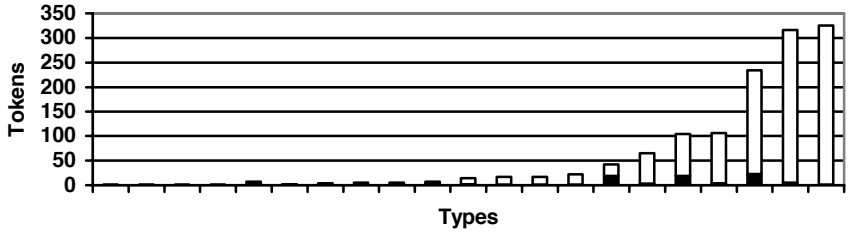


Figure 7. Type- of the Lezgian token diagram Repetitive in Mark

Grammatical classes and heavy classes have a high albedo, since most tokens of the types that are affected by them in a corpus are non-affected (we might say, they are white, "reflecting"). In contrast to heavy and

grammatical classes, lexical classes typically have low albedo, while their token and type frequencies can be high, sometimes as high as for grammatical classes. In Figure 6, Light 'again' *ré/r(e)-* in French, shows a typical type-token diagram for a lexical class. Note also that there is no strong correlation between the total number of tokens and the number of non-affected tokens. Furthermore, there are many tantum forms (i.e., forms that occur only as members of the class, not elsewhere), see also Wälchli (2005: 119–121).

Not all classes correspond exactly to one of the three rough types. It has been mentioned that negation, which has the type-token profile of a grammatical class, at the same time exhibits properties of a heavy class. In another way, light 'again' is exceptional in a number of languages, such as the Repetitive in Lezgian, whose type-token diagram is given in Figure 7. The Lezgian Repetitive covers both the domains of light and heavy 'again'. Moreover, it happens to collocate with three high frequency verbs *atun* 'come', *fin* 'go', and *q̃ačun* 'take', which raises its albedo. However, the fact that it collocates with particular verbs (there is one tantum form in the text with the host *sağarun* 'cure') testifies to its lexical class character.

Table 4 lists various instances of heavy, grammatical, and lexical classes with their values for token and type frequencies, token range, albedo, and number of significantly locally unmarked types.

It is an open question to what extent various kinds of distributional patterns are associated with the traditional lexeme vs. word form distinction which mainly rests on the idea of paradigmaticity and compositionality. Word forms usually belong to a paradigm and are semantically transparent while lexemes tend to be semantically not fully compositional.

Type-token profiles have been considered only for light 'again' and not for co-compounds. Actually, it is much more difficult to describe compounds in a similar way, because it is not obvious what should be counted as white tokens; those of the first or the second part of the compound or the occurrence of both lexical parts at the same time in phrasal coordination.

5. Conclusions

Degree of fusion is overestimated as a factor for determining the behaviour of linguistic categories, especially the small difference between word-like phrasal units and real words, on which the traditionally strict division of morphology and syntax rests. This paper takes up two lexical class types –

co-compounds and light 'again' – and shows how their expression possibilities range over morphological and syntactic forms. It thus makes a case for the utility of unified function-based descriptions that encompass classes regardless of whether they are morphological or syntactic.

Notes

1. Parts of this paper have been presented at the ALT V conference 2003 in Cagliari. I would like to thank Edith Moravcsik, Matti Miestamo, and Zygmunt Frajzyngier for many useful comments on an earlier version of this paper. Due to limitations of space, I was not able to address many worthwhile remarks made on earlier versions of this paper. For statistical expertise in Section 3 I am grateful to Reinhard Köhler and Michael Cysouw, but I am responsible for all errors. Abbreviations used in glosses: 1 first person, 3 third person, FUT future, GEN genitive, IRR irrealis, NOM nominative, NOML nominalization, OBL oblique stem, PL plural, PST past, PFV perfective, RE light 'again', REAL realis, SG singular. Infixes are glossed with < > as recommended in the Leipzig Glossing Rules.
2. In this paper hyphens are rendered as =, since hyphens are used for morpheme boundaries.
3. In Yareba (Yareban), a compound from *kua* 'dog' and *boro* 'pig' is the normal word for 'children': *koiniboro* (-*ini* is 'with/and').
4. Names of language-particular categories are capitalized according to common standard.
5. Many relevant classes have relevant subclasses. For example, irregular and regular Past tense forms in Dutch differ not only in formal, but also in semantic properties (Tabak, Schreuder, and Baayen 2006).
6. The heavy-light distinction is inspired by Kemmer's (1993: 24–25) distinction between heavy and light forms in the discussion of middle and reflexive. The heavy reflexive (as in *he sees himself*) is more emphatic and tends to be expressed in all languages in contrast to the corresponding light form middle, as in French *il se lave*, where English, not having a middle of the French type, simply has *he washes* without any overt marker.
7. It is moreover difficult to apply in many particular languages, but this is not discussed here (see Wälchli 2005, Ch. 4).
8. The labels of the passages are the English (King James) forms. Note that *parents* and *father and mother* refer to different passages (*and children shall rise up against their parents* [13:12], *he taketh the father and the mother of the damsel* [5:40]).
9. This is perhaps the case in the Tajik text, where the pattern A-*u* B or even univerbated A-*u*-B with *u* 'and' instead of the usual conjunction *wa* 'and' in

phrasal coordination, is used extensively at least in the part of domain of co-compounds which still has phrasal coordination counterparts.

10. The sharp border of the phrasal coordination domain might be partly due to translation effects. Passage 2:16 where the Classical Greek text has variants with and without coordination (literally 'eat' and 'eat and drink') is rendered as phrasal coordination in other texts less often than passages where the Greek text has coordination consistently.
11. A partial exception is 'parents', which is a co-compound in 12 languages out of 17 with more than one co-compound. This lexical context is probably the best single indicator for co-compounding, see Wälchli (2005: 217, Map 6.2).
12. Of course, it cannot be taken for granted that there is invariant behavior for all varieties of a language. There is actually some evidence that co-compounding is also subject to considerable language-internal variation (see, e.g., Wälchli 2005: 214, 218–225)
13. This is a borrowing from astronomy, where albedo is a measure for the darkness of a body. The more light it absorbs, the lower its albedo.

References

Altmann, Gabriel, and Werner Lehfeld
1973 *Allgemeine Sprachtypologie. Prinzipien und Meßverfahren*. München: Fink.

Bybee, Joan
1985 *Morphology*. Amsterdam: Benjamins

Bybee, Joan, and Östen Dahl
1989 The creation of tense and aspect systems in the languages of the world. *Studies in Language* 13 (1): 51–103.

Cohen, Diana
1998 *A Grammatical Description of Tarahumara*. Ann Arbor: UMI Microform 1391489.

Conrad, Robert J., and Kepas Wogiga
1991 *An Outline of Bukiyip Grammar*. (Pacific Linguistics C 113.) Canberra: Australian National University.

Cysouw, Michael
2002 Interpreting typological clusters. *Linguistic Typology* 6: 69–93.

Cysouw, Michael, and Bernhard Wälchli
2007 Parallel texts. Using translational equivalents in linguistic typology. Theme issue in *STUF Sprachtypologie & Universalienforschung* 60 (2): 96–181.

Dahl, Östen
2004 *The Growth and Maintenance of Linguistic Complexity*. Amsterdam: Benjamins.
Gaeta, Livio, and Davide Ricca
2002 Corpora testuali e produttività morfologica; i nomi d'azione italiani in due annate della *Stampa* (1996–1997). In *Parallela IX. Testo – variazione – informatica. Atti del IX Incontro italo-austriaco dei linguisti*, Roland Bauer, and Hans Goebl (eds.), 223–249. Wilhelmsfeld: Egert.
Haspelmath, Martin
1997 *Indefinite Pronouns*. Oxford: Clarendon.
Kemmer, Suzanne
1993 *The Middle Voice*. Amsterdam: Benjamins.
Miestamo, Matti
this vol. Symmetric and asymmetric encoding of functional domains with remarks on typological markedness.
Mühlhäusler, Peter
1979 *Growth and Structure of the Lexicon of New Guinea Pidgin*. Camberra: Australian National University.
Plank, Frans
1994 Inflection and derivation. In *The Encyclopedia of Language and Linguistics*, Asher R. E. (ed.), 10 volumes, 1671–1678. Oxford: Pergamon.
Stolz, Thomas
forthc. Das ist doch keine Reduplikation! Über falsche Freunde bei der Suche nach richtigen Beispielen. In *Wiederholung, Parallelismus, Reduplikation. Juli 2006, Bremen*. Andreas, Ammann, and Aina Urdze (eds.). (Diversitas Linguarum 16.) Bochum: Brockmeyer.
Tabak, Wieke M, Robert Schreuder, and R. Harald Baayen
2006 Lexical statistics and lexical processing: Semantic density, information complexity, sex and irregularity in Dutch. In *Linguistic Evidence. Empirical, Theoretical and Computational Perspectives*, Stephan Kepser, and Marga Reis (eds.), 530–555. (Studies in Generative Grammar 85.) Berlin/New York: Mouton de Gruyter.
Tiersma, Peter Meijes
1982 Local and general markedness. *Language* 58 (4): 832–849.
Veselinova, Ljuba N.
this vol. Suppletion from a typological perspective.
Wälchli, Bernhard
2005 *Co-compounds and Natural Coordination*. Oxford: Oxford University Press.
2006 Typology of light and heavy 'again', or, the eternal return of the same. *Studies in Language* 30 (1): 69–113.

Part III. Nominal and verbal morphosyntax in interaction: Transitivity and alignment

Defining transitivity: Markedness vs. prototypicality

Ashild Næss

1. Introduction

The division of verbs and clauses into transitive and intransitive is one of the most fundamental distinctions of linguistic theory. It is central to our understanding of a number of basic phenomena of language such as argument structure alternations, case marking, and verb inflection; and it is assumed to be universal or near-universal (Dixon 1979: 102–103, 1994: 6–7).[1]

However, it is not entirely clear how to provide a cross-linguistically valid and theoretically consistent definition of this distinction. In current functional typology, there exist two distinct approaches to the concept of "transitivity", which to a certain extent make contradictory predictions. While the prototype approach, most famously set out by Hopper and Thompson (1980), defines a *prototypical transitive clause* as one which, among other things, has a highly individuated, definite and animate object, the other approach, based on the concept of markedness or "naturalness", claims that the *most natural transitive clause* is one where the object is relatively low in definiteness and animacy (Comrie 1989: 128; Aissen 2003). In other words, a "prototypical" transitive clause according to one framework is a "marked" or "less natural" transitive clause according to the other.

In my dissertation (Næss 2003) I focused on the prototype approach, proposing a definition of the transitive prototype which accounted for otherwise problematic data as well as suggesting a functional basis for the prototype as such. To the extent that I addressed the markedness approach, I argued for an alternative, prototype-based analysis of some of the data usually cited in support of this approach.

In this paper I will examine both approaches in more detail and argue that they are not necessarily in direct conflict; rather, the apparent contradiction stems from a fundamental difference in their underlying theoretical assumptions. The term "transitive clause" is in fact being applied to two rather different concepts, so that the two approaches, with their different theoretical starting-points, are essentially talking about two different things.

A discussion of the definition of the term "transitivity" is in considerable danger of getting caught up in a number of other, related problems of definition, notably the question of how to define terms such as "object" and "argument". Clearly, an exhaustive discussion of these issues is beyond the scope of the present paper. However, an effort will be made to keep the terminology of the discussion below as clear and uncontroversial as possible.

A primary distinction will be drawn between events which crucially involve only a single participant versus events which involve (at least) two; this is thought to be a distinction universally encoded in human language (Dixon 1979: 102). Two-participant events can be encoded formally in different ways; a common distinction is between a construction which encodes the patient-like participant as an independent syntactic argument of the clause (a "direct object"), versus one which accords this participant a low degree of syntactic independence, for instance as an NP incorporated into the verb phrase, or as an oblique argument of an "extended intransitive" clause (Dixon 1994: 122–123; Dixon and Aikhenvald 2000: 3).

The term "O" or "O NP" will be used here for the non-agent-like participant (as opposed to the agent-like participant, the A) of a two-participant event, regardless of its syntactic status. Note that this use differs from that of Dixon (e.g., 1979, 1994), where the terms A and O refer explicitly to arguments of formally transitive constructions. On the other hand, my use of the terms conforms to that found in Hopper and Thompson (1980: 252, note 1). This use of the terminology is chosen as a means to distinguish clearly between participants on the one hand and (syntactic) arguments on the other. The term "object" will, as far as possible, be reserved for nonsubject syntactic arguments (subject being understood as the set of syntactic arguments typically encoding S and A participants), where argumenthood is assumed to be reflected overtly by morpho-syntactic means such as agreement marking or pronoun choice in the languages cited. It should be noted, however, that where the works discussed in the text use these terms – specifically "object" – in a less precise manner, quotes and direct discussion of these must necessarily retain the original terminology.

2. The prototype model

The notion of a *transitive prototype*, that is, a set of semantic properties typically characteristic of formally transitive clauses, is well established in functional linguistics, and is argued for, e.g., by Lakoff (1977), Hopper and

Thompson (1980), Givón (2001: 109), and Lazard (2003), to mention but a few. Some details in the precise formulation of the prototype may vary, but there is general agreement on the basic semantic properties that define a transitive construction: the clause should have an active, volitional agent participant and a concrete, specific, affected patient; furthermore the event should be presented as real and concluded, in other words the clause should show perfective aspect and realis mood, and be affirmative rather than negated or interrogative.

The prototype is taken to be language-universal, and the implication for individual languages is the following: In any given language, the formally transitive clause is the one which is used to describe events corresponding to the semantic transitive prototype; in addition, individual languages may extend the use of this construction to clauses which deviate from the prototype in various ways. However, if a language has more than one (basic and underived) construction used to describe two-participant events, then the one whose use corresponds most closely to the prototype should, in this view, be considered the basic transitive clause.

Although the notion of a transitive prototype is frequently appealed to both in theoretical and descriptive work, and has proved successful in accounting for a wide range of linguistic phenomena, various aspects of it have been questioned (see e.g., DeLancey 1987; Primus 1999: 57–59; Lazard 2003, as well as the comments on Hopper and Thompson's prototype analysis in Aissen 2003: 438, footnote 4). Perhaps the most interesting problem is the lack of understanding of the underlying rationale for the prototype: why do such disparate properties as individuation of the O participant, aspect, negation and agency correlate systematically across languages? This question will be discussed in Section 5 below.

3. The markedness approach – Comrie's generalization

Much attention has been paid in linguistic literature to the correlation between the grammatical relation of a noun phrase to its predicate and certain inherent properties of the noun phrase in question – notably *definiteness* and *animacy*, two properties associated with the notion of *individuation*.

In a much-cited statement, referred to by de Swart (2003: 60) as "Comrie's generalization", it is claimed that "the most natural kind of transitive construction is one where the A is high in animacy and definiteness, and the P [= O] is lower in animacy and definiteness; and any

deviation from this pattern leads to a *more marked construction*" (Comrie 1989: 128 [emphasis mine]).

The linguistic evidence cited in support of this claim is of two main types. Firstly, so-called direct-inverse systems indicate the relative position of A and O on the animacy hierarchy directly on the verb, typically involving a special marker if the O is higher on the hierarchy than the A. Secondly, the phenomenon known as differential case marking: In languages which case-mark some direct objects but not others, the case-marked objects tend to be definite rather than indefinite, or animate rather than inanimate (Comrie 1989: 129–136; Bossong 1991; Aissen 2003). The precise distinction varies from language to language, so that, for instance, Catalan case-marks only pronoun objects, Pitjantjatjara case-marks pronouns and personal names in object position, while Sinhala optionally case-marks all animate objects; Modern Hebrew case-marks all definite objects while Turkish case-marks definites and specifics but not nonspecific objects (Aissen 2003: 450–454). In all cases, however, it is the objects relatively high on the definiteness or animacy hierarchies which take accusative case-marking; it is generally assumed that the opposite does not occur, in other words languages should not show case-marking of indefinite objects but not definite ones (but see Section 4 below), or inanimate objects but not animate ones.

The markedness analysis, then, claims that the overt marking on definite/animate objects as opposed to indefinite/inanimate objects is a morphological signal of the semantic or pragmatic markedness of definite and animate objects as such. This is linked to the functional analysis of case-marking as a disambiguation device: An indefinite/inanimate argument is more likely to be the object of the clause than the subject, since subjects are typically definite and animate, and so no overt case-marking is required when the object is indefinite/inanimate. By contrast, a definite/animate argument might in theory function either as subject or object, and so overt case-marking is more frequently employed in such cases, to avoid potential ambiguity.

A significant feature of this approach is that it defines a "natural transitive clause" in terms of a postulated opposition between subject and object in terms of the properties of definiteness and animacy: subjects are typically definite and animate, and it is argued that the least marked situation is for the object to show a contrast to the subject in this respect, so that the typical or unmarked object will be low in definiteness and animacy. The problems with assuming such a semantic opposition in terms of these particular properties are discussed in detail in Næss (2003, 2004). The current paper will focus on the assumed markedness relation implicit in the

formulation "natural transitive construction": the relative markedness of clauses with definite or animate objects compared to other kinds of clauses.

In its original formulation, Comrie's generalization does not explicitly mention the markedness of definite or animate objects as such; it only states that the P [O] should be lower than the A in definiteness and animacy. In practice, however, this statement has usually been interpreted as meaning that clauses with definite/animate objects are marked relative to clauses with indefinite/inanimate objects, as seen e.g., in Aissen (2003).

The precise formulation of Comrie's generalization is somewhat vague on an interesting and rather crucial point. It speaks of the "most natural transitive construction" in terms of the semantic properties of A and P [O], but of the result of deviations from this semantic configuration as a "more marked construction". The usual interpretation is that a clause with a high-individuation object is a more marked kind of transitive clause, that is, that it is marked in comparison to other kinds of transitive clauses (those with low-individuation Os). This interpretation is clearly the basis for Aissen's (2003) analysis of differential object marking, where it is claimed that high-individuation objects are "marked qua objects" and therefore more likely to take overt case-marking.

But the formulation "more marked construction" only specifies that these clauses are marked with respect to some other kind of construction, not that they are necessarily marked with respect to other transitive clauses. The difference is a subtle but crucial one, and naturally hinges on one's precise definition of the concept of "transitive clause". The reason why it is relevant is that in many languages, the "natural transitive constructions" of Comrie's generalization do not appear to be transitive clauses at all, in the way that the term is normally defined.

4. Objects and transitivity

Consider the following examples of constructions with definite and indefinite objects, respectively:[2]

(1) West Greenlandic (Eskimo-Aleut; Fortescue 1984: 85, glosses from Cooreman 1994)

a. *inuit* *tuqup-pai*
people.ABS kill-TR.IND.3SG.ERG.3PL
'He killed the people.'

b. *inun-nik* *tuqut-si-vuq*
people-INS kill-ANTIP-INTR.IND.3SG.ABS
'He killed people.'

(2) Chamorro (Austronesian, Western Malayo-Polynesian; Topping 1973: 83–85)

a. *Hu li 'e lepblo*
1SG see DEF book
'I saw the book.'

b. *Manli'e' yo' lepblo*
INDF.OBJ.see 1SG book
'I saw a book.'

(3) Äiwoo (Reefs-Santa Cruz)[3]

a. *Nuwopa-ee i-lââ-no nä-tä*
house-DEM PFV-build-1MIN.SBJ IRR-3MIN.POSS.LOC
gino-u
son-1MIN.POSS
'I built this house for my son.'

b. *I-lâwââ nuwopa nä-tä*
1MIN.SBJ.PFV-build house IRR-3MIN.POSS.LOC
gino-u
son-1MIN.POSS
'I built a house for my son.'

In all these languages, the (b) clauses, with indefinite O, are formally intransitive. In West Greenlandic (1), the verb in the (b) clause is antipassivized, and the indefinite O takes the instrumental case. If one looks purely at the marking of the O NP, this appears to represent a counterexample to the generalization that definite objects are always overtly case-marked if any objects are; the definite object in (1a) is unmarked whereas there is overt instrumental case on the indefinite object in (1b). Clearly, this marking pattern is a result of the antipassive construction being applied in (1b), and so it may not be directly comparable to the instances of differential object marking discussed above, where the only difference in the clause is between marking vs. non-marking of the object. Rather, the contrast in (1a–b) is between a structurally transitive clause in (a), and an an "extended intransitive" (Dixon and Aikhenvald 2000: 3) with an oblique O participant in (b).

Chamorro has a distinct verb form which is used with indefinite Os. In addition to the change in verb form, the subject pronoun takes a different form in (2b) than in (2a), and it follows rather than precedes the verb. The postverbal subject pronouns that occur in clauses with indefinite Os in

Chamorro are the same as those found in intransitive clauses – compare (2b) to (4):

(4) Chamorro (Austronesian, Western Malayo-Polynesian; Topping 1973: 83)
Macho'cho yo'
work 1SG
'I worked.'

As far as the choice of subject pronoun is concerned, then, Chamorro clauses with indefinite objects pattern with intransitive rather than transitive clauses. Cooreman (1994) describes the *ma(n)-*prefixed verb form as an antipassive, which would make Chamorro (2) parallel to West Greenlandic (1).

Äiwoo has distinct sets of person markers for transitive and intransitive verbs. In intransitive clauses, the person and number of the subject is indicated by a prefix, while in transitive clauses the subject and object are both marked by suffixes. There is no overt object suffix in (3a) because the third person minimal marker is zero in all cases except when a third minimal transitive subject is combined with a non-third minimal object;[4] but compare (3a,b) to (5) (the suffix *-ne* is the form of the first person minimal subject suffix *-no* found before second person object suffixes).

(5) Äiwoo (Reefs-Santa Cruz)
I-togulo-ne-mu
PFV-hit-1MIN.SBJ-2MIN.OBJ
'I hit you.'

With respect to person marking on the verb, the clause with an indefinite O NP behaves like an intransitive; compare (3b) to (6):

(6) Äiwoo (Reefs-Santa Cruz)
I-wo-lâ *ngä* *taon*
1MIN.SBJ.PFV-go-out to town
'I went out to town.'

The clause with indefinite O, like the intransitive clause in (6), takes a subject-marking prefix rather than the suffix *-no* found in (3b). Note that this prefix is homophonous with the perfective aspect prefix *i-*, and that in clauses where the two are combined, only a single *i-* is realized on the

surface. Therefore, the *i-* glossed 1MIN.SBJ.PFV in (3b) and (6) is formally indistinguishable from the *i-* glossed simply PFV in (3a) and (5). The pertinent point, however, is that (3b) and (6) lack the transitive subject suffix found in (3a) and (5), and that the O NP of (3b) cannot be cross-referenced on the verb.

In addition to this difference in person marking, (3a) and (3b) have different forms of the verb – *lââ* in (3a) vs. *lâwââ* in (3b). This appears to be a systematic feature of the Äiwoo lexicon: two-participant verbs come in two varieties, one which is used when the O NP is definite and singular and when the clause makes reference to a single, specific occurrence of a completed event, while the other form is used with indefinite or plural Os, with descriptions of repeated and habitual actions, or incompleted actions.[5] This distinction corresponds to that between higher and lower semantic transitivity on the prototype definition (Hopper and Thompson 1980; Næss 2007), and is accompanied by a morphological distinction: the forms used with definite Os take transitive person marking, as in (3a), while the forms used with indefinite Os take intransitive marking (3b). There is also a difference in word order: basic word order in clauses with definite Os is OVS, whereas with indefinite Os it is SVO. In this respect, too, clauses with indefinite objects pattern with intransitive clauses, where word order is SV.

Examples such as these throw an interesting light on Comrie's generalization, since in these languages, indefinite "objects" in fact are not objects at all from a purely formal point of view – they are encoded syntactically in intransitive clauses, which by definition do not have direct objects. In the words of Hopper and Thompson (1980), "an indefinite O is not really an O at all, but is a subordinate part of a compound in which the verb stem is the head (i.e., it is incorporated into the verb)." The notion of object incorporation may be particularly relevant for the Äiwoo examples, where the O NP behaves as part of the verb phrase with respect to word order, following the sequence of subject and verb which is the normal order for intransitive clauses. Typically in incorporation constructions, the incorporated object loses its status as a syntactic argument of the verb, and the resulting clause is formally intransitive (Mithun 1984); this is exactly what happens in (3b) where the O NP is not cross-referenced on the verb and person marking follows the intransitive pattern. Compare (3a,b) to (7), cited in Mithun (1984) as an example of noun incorporation:

(7) Kanjobal (Mayan) (Robertson 1980: 137–138)

a. *š-Ø-a-lo-t-oq* *in-pan*
PST-ABS.3-ERG.2-eat-go-OPT ERG.1-bread
'You ate my bread.'

b. *š-at-lo-w-i* *pan*
PST-ABS.2-eat-AFF-AFF bread
'You ate bread.'

It would seem, then, that if Comrie's generalization is to be taken literally, then in languages such as West Greenlandic, Chamorro and Äiwoo, the "most natural transitive construction" is in fact an intransitive clause. While this is clearly an undesirable conclusion, it does not as such render Comrie's generalization invalid, but it does force us to examine more closely the theoretical assumptions underlying it: clearly, there is more than one way of understanding the term "transitive clause". In what follows, I will first examine the precise implications of a prototype definition of transitivity, so that these can then be compared to the assumptions underlying a markedness analysis such as that expressed by Comrie's generalization.

5. The basis of the transitive prototype

The notion of a language-universal semantic transitive prototype raises some crucial questions. Why would languages converge on such a semantic prototype – what is it for? And why does it look the way it does – in other words, why does this particular set of seemingly disparate semantic properties correlate across languages?

Hopper and Thompson (1980: 279–280) acknowledge the relevance of this question – the need to establish a unifying principle behind the list of properties, a "superordinate semantic notion which will include all the Transitivity features". They offer no candidate for such a unifying principle, but suggest that the universal relevance of the concept of transitivity could be linked to the notion of discourse prominence – clauses characterized by the presence of many of the transitivity features tend to be foregrounded in discourse.

DeLancey (1987) suggests that the link between transitivity and foregrounding is rather an indirect one, following from the fact that the transitivity parameters represent a salient cognitive prototype. In his view, "[t]he cluster of attributes associated with transitivity define a semantic

construct which approximates the notion of EVENT as opposed to STATE" (DeLancey 1987: 58). The tendency for clauses high in transitivity to be foregrounded in discourse would then follow from descriptions of events being the central element of narratives.

DeLancey notes a central feature of prototype theory as laid out in e.g., Rosch (1978): cognitively optimal categories are defined as being maximally distinct from other categories in the same domain. According to Rosch, categories within a given domain are defined principally by the properties which distinguish them from each other: "the more prototypical of a category a member is rated, the more attributes it has in common with other members of the category *and the fewer attributes in common with members of the contrasting categories*" (Rosch 1978: 37 [emphasis mine]).

Which "contrasting categories" can be found in the semantic domain to which the transitive prototype belongs? DeLancey suggests that the relevant contrasting prototype categories are in fact "state" vs. "event", and that what is perceived as the transitive prototype is actually defined to maximize differentiation with the state prototype. A possible problem with this analysis is the lack of independent justification for the link between transitive clauses and the event prototype: why would a prototypical event necessarily have two participants rather than one, or perhaps three?

A simpler and perhaps more intuitive approach, which makes no assumptions about the inherent properties of states or events, is to say that the primary relevant contrast within the domain in question is that between one-participant and two-participant states of affairs, as discussed in the introduction[6] – in other words, that the transitive prototype is defined in maximal contrast to the intransitive prototype. This may seem like a rather trivial observation, but in fact it is highly relevant to an understanding of the differences between the markedness and prototype approaches to transitivity.

The notion of the transitive prototype as being maximally distinct from the intransitive prototype underlies the analysis of middle constructions presented in Kemmer (1993). This work relates semantic transitivity not to the distinction between states and events, but to what Kemmer calls the "relative elaboration of events". This is to do with the degree to which complex events are presented as composed out of several distinct parts, or as an indivisible whole. In English, the sentence *John and Mary kissed each other* can be read as meaning that first John kissed Mary, and then Mary kissed John; the event is presented as consisting of two separate acts of kissing performed by two individual agents. The sentence *John and Mary kissed*, on the other hand, can only mean that John and Mary

simultaneously brought their lips together in a kiss (a reading which is also possible, but not obligatory, with *John and Mary kissed each other*); the event is here presented as consisting of a single act of kissing, without focusing on the individual participants as distinct, independent agents. This relatively low degree of elaboration corresponds to the encoding of the clause as formally intransitive, while the higher degree of elaboration is expressed through a formally transitive clause.

An important factor in the elaboration of events is the distinguishability of participants. This refers to the degree to which, in a two-participant event, the agent is construed as physically or conceptually distinct from the patient. Such distinguishability of participants, Kemmer argues, is central to the notion of semantic transitivity, since constructions with a low degree of distinguishability of participants are "semantically more like prototypical one-participant events, which involve a single indivisible participant" (Kemmer 1993: 213). That is, events for which the two participants involved are not clearly distinct, either physically (as with reflexives, where the agent and patient participants are physically the same entity) or conceptually (as with reciprocals, where both participants play the part of both agent and patient, and so cannot be clearly distinguished into one agentive and one patientive participant), tend to be encoded in formal constructions showing intransitive characteristics, because the lack of a clear distinction between the participants renders the event more similar to an intransitive event, that is, an event involving a single participant.

Næss (2003, 2007) argues that the logical consequence of this approach is that the transitive prototype should be defined in terms of a *maximal semantic distinction* between the agent and patient arguments: for the two arguments of a transitive clause to be clearly conceptually distinct means that they should be characterized by opposing semantic properties, in terms of their involvement with the event in question. Note that this is distinct from the idea discussed in Section 3 above, where an opposition was assumed between subjects and objects in terms of the degree of individuation of the arguments, their definiteness and animacy. Rather Næss (2003, 2007) argues for a semantic opposition in terms of the way in which two highly individuated participants interact, so that the participants are perceived as more clearly distinct the more distinct their roles in the event.

In other words, the notion of maximally distinct categories should be applied not just to the transitive-intransitive contrast as such, but to the individual arguments involved in a prototypically transitive event, precisely because the basic property that characterizes a transitive clause as opposed

to an intransitive clause is the fact that it involves two distinct, independent participants as opposed to just one.

The properties typically taken to define the participants of a transitive event are volitional instigation (causation) on the part of the agent, and affectedness on the part of the patient (e.g., Lakoff 1977: 244; Hopper and Thompson 1980: 252; Givón 2001: 109; Lazard 2003: 152). Næss (2003, 2007) argues that the categories "agent" and "patient", and through them the notion of "transitive prototype", should be defined in terms of a semantic opposition between these properties: in a prototypical transitive clause the agent acts volitionally to instigate the event, but is not affected by it, while the patient has no volitional involvement, does not contribute to the instigation of the event, but is affected by it. For any deviation from this configuration of properties, languages can be found which employ a construction other than a fully transitive clause to express the event in question.

It may be fruitful to recognize a concept of *distinctness* as including both *distinguishability* in Kemmer's sense (the degree of physical/ conceptual differentiation between the agent and patient participant, including the semantic opposition discussed above) and *individuation* as discussed in Section 3 above (the distinctness of each participant from the general background). A prototypical transitive clause can then be construed as one involving two distinct participants, as opposed to only a single distinct and prominent participant (and possibly a second, less distinct participant). The different semantic properties usually taken to contribute to the degree of transitivity of a clause can then be understood as operating on the degree of distinctness of the participants: an incomplete event has no perceptible effect on the patient and therefore reduces the semantic opposition between agent and patient, a negated or hypothetical event is not instigated (and has no effect either) and so similarly shows a low degree of semantic distinction between the participants, a definite object is more clearly distinct in the context than an indefinite one, and so on. In this way, the transitive prototype can be re-cast as referring to the degree of distinctness, including both individuation and semantic distinction, of the participants of a two-participant event (Næss 2007).

This analysis goes some way towards providing a functional basis for the transitive prototype. Quite simply, the use of a construction with two distinct, independent noun phrase arguments is more likely the more distinct and independent the participants involved; in other words, there is an iconic relationship between the formal structure of a transitive clause and the type of event it is used to represent. This distinctness of participants is not only defined in terms of simple physical separateness, but also in

terms of the way in which the participants interact with the event – an event involving one purely agentive and one purely patientive participant is more likely to be cast in a clause with two independent syntactic arguments than one where both participants show both agentive and patientive properties.

6. Prototypes and markedness

The understanding of prototypical transitivity as referring to clauses involving two clearly physically and conceptually distinct participants clearly contrasts with the proposal that "natural transitive constructions" have O arguments which are relatively low in individuation. By the reasoning of Kemmer (1993) and Næss (2003, 2007), events involving less individuated O participants are semantically more similar to intransitive events, because they do not involve two clearly distinct and individuated entities. If the O is not construed as an independent entity, then the event is relatively less elaborated than one involving an O participant clearly independent of and distinct from the agent, and is therefore not conceived of as a genuinely transitive event.

Interestingly, this analysis from a semantic point of view exactly correlates with the formal facts reviewed in Section 4, where it was shown that a number of languages encode clauses with low-individuation Os as formally intransitive. Granted, these clauses have two overt NPs representing the participants of the event described, but they do not appear to have two syntactic arguments – the O NPs are not cross-referenced on the verb (West Greenlandic, Äiwoo), do not influence the choice of subject pronoun (Chamorro), and take oblique case-marking (West Greenlandic). In short, these languages have two distinct constructions for two-participant events, and while the markedness approach defines one – the (b) clauses – as the "more unmarked" or "more natural" transitive clause, the prototype approach defines the other – the (a) clauses – as the "most prototypical" transitive clause.

What this suggests is not so much a direct conflict between the two approaches, in the sense that one interprets the data more "correctly", but rather that the term "transitive" is being used in rather different senses in the markedness and prototype analyses. The markedness analysis refers to the least morphologically marked two-participant clause, whereas the prototype approach defines as "transitive" only those clauses which are clearly formally and semantically distinct from intransitive clauses.

The fundamental difference lies in what is being compared. The markedness approach defines as "marked features" exactly those properties

which clearly distinguish transitive from intransitive clauses: a highly individuated O argument as opposed to one which is less clearly distinct from the general background or from the other argument of the clause, explicit formal marking of the O NP as opposed to an O with less overt morphological marking. The underlying, implicit standard of comparison is in fact a clause with no object at all: the clause is considered more "natural" the less individuated its object, in other words the closer it is, both formally and semantically, to a clause with no object.

That is, the implicit premise for Comrie's generalization is that the most "natural" kind of clause is an intransitive clause; the more a two-participant clause deviates from the basic intransitive pattern, the less natural, or more marked, it is considered. The implication is that formally transitive clauses are marked structures as such, as indeed is suggested by the original formulation of Comrie's generalization: "... any deviation from this pattern leads to a more marked construction" (Comrie 1989: 128).

In many ways, this is a reasonable assumption. It is true in the obvious sense that transitive clauses are more complex both morphosyntactically and semantically than intransitive clauses. Furthermore, it is well known that transitive clauses with two lexical noun phrase arguments are rare in discourse, and that there is a tendency for languages to use intransitive clauses to introduce new referents before these are cast as arguments of a transitive clause (DuBois 1987). This is thought to reflect a processing constraint: introducing a new referent into discourse demands a high degree of attention on the part of both speaker and hearer, and should therefore ideally be limited to a maximum of one per clause. Similarly, it is conceivable that keeping track of two distinct, independent participants is relatively demanding, and that the use of a construction whose prototypical reference is to an event involving two independent entities with distinct semantic properties is thus restricted to cases where it is absolutely necessary to pay equal attention to both participants at once. By contrast, by using a formally intransitive construction to describe a two-participant event, one presents the event in question as a simple interaction between an individual and the world, and backgrounds any additional entities of secondary interest from the typically human subject participant's point of view, by placing them in a syntactically less prominent position. In that respect, it may be justified to call such constructions "more natural clauses", both in that they structure the situation in terms of one single prominent participant and so are simpler in terms of information structure, and in that they cast the typically human agent participant as the primary focus of attention and accord relatively less importance to the undergoing participant being manipulated by the agent. The problem arises when the

term "more natural transitive construction" is used for this clause type, since the term "transitive" is more commonly used to refer to the type of clause which accords equal syntactic prominence to both participants.

7. Conclusion

This paper has discussed a potential contradiction between two theoretical approaches to the notion of transitivity: what I have called the markedness approach, which claims that clauses with indefinite and inanimate O arguments are "more natural transitive constructions" than ones with definite and animate Os, and the prototype approach, which claims that clauses with definite and animate Os are "more prototypically transitive" than clauses whose Os are low in definiteness and animacy.

The two approaches do indeed contradict each other in the sense that they use the term "transitive clause" for two fundamentally different entities: for the two-participant clause most formally similar to the intransitive clause (Comrie's "most natural transitive construction"), and for the two-participant clause most formally and semantically distinct from the intransitive clause (the prototype model), respectively.

However, this is primarily a problem of terminology rather than of in principle incompatible theoretical approaches. It is perfectly possible to reconcile the idea, thoroughly established in linguistic theory and backed up by the principles of prototype theory, that a prototypical transitive clause is by definition the clause type most distinct from the prototypical intransitive clause, with the idea that the transitive prototype in itself represents a marked kind of structure. The notion of a prototype only defines the prototypical reference of a particular kind of linguistic structure (in this case, the transitive clause); it says nothing about the relationship of this structure to other structures in a language, and there is no reason why a "prototypical transitive clause" cannot enter into a markedness relation where it is the marked member of an opposition to some other kind of clause.

Principles of iconicity may dictate that a construction with two distinct argument NPs be chosen to represent an event with two clearly distinct participants; on the other hand, requiring a listener to attend simultaneously to two equally prominent participants may be a relatively demanding task, and so concerns of processing and economy might make it more desirable to cast the event in terms of one single prominent participant, with the second participant being presented as being of secondary importance. In this sense, the fully transitive construction could be conceived of as

"marked" compared to other available strategies for the encoding of two-participant events. There is, however, an important difference between saying that transitive clauses are marked structures, as has been suggested here, and saying that the kinds of formal structures typified by the transitive prototype are marked transitive clauses. The latter formulation implies a comparison with some other type of transitive clause which is less marked; but as we have seen, the less marked structures in question tend to be more like intransitive clauses, formally speaking.

In a sense, then, the discussion boils down to a question of exactly what the term "transitive clause" should be taken to mean. This is not a trivial problem, especially not in linguistic typology, where the success of the endeavour of comparing structures across languages depends crucially on ensuring that what one is comparing are in fact comparable entities (cf. e.g., Stassen 1985: 14–15; Croft 2003: 13–19). Linguistic theory is rife with terminology inherited from classical grammar and often used rather uncritically, without any precise definition. "Transitivity" and "transitive clause" are certainly such terms, often taken to be so well understood that further definition is unnecessary. However, the above discussion has shown that this is clearly not the case, as two distinct uses of the term "transitive clause" lead to apparently contradictory theoretical analyses, both backed up by ample cross-linguistic data. What starts out as a difference in terminology then quickly expands into a theoretical opposition, obscuring the fact that the two approaches are really just dealing with two different aspects of the same phenomenon.

What, then, is the "correct" definition of the term "transitive clause"? Clearly, there is no such thing; definitions do not have truth values, but are essentially statements of intent, saying that "for the purpose of this discussion I will designate entities with properties X, Y and Z with label L". However, a definition can be more or less adequate for the analytical task at hand. As far as the preceding discussion of transitive clauses goes, I have proposed to distinguish between "two-participant constructions" as being any kind of sentence type with two overtly expressed participants, and "transitive clauses" as being those two-participant constructions which are maximally formally and semantically distinct from one-participant constructions (intransitive clauses). This definition corresponds closely to the traditional conception of a transitive clause, and helps to clarify the precise distinctions involved in the markedness and the prototype analyses, respectively. I would argue, furthermore, that a definition which includes any kind of two-participant construction under the label "transitive clause" to a significant extent obscures the whole transitive-intransitive distinction, since it allows some "transitive clauses" to pattern formally with

intransitive clauses while others show a formal behaviour distinct from such clauses (cf. Section 4). My main concern, however, is with pointing out that different possible definitions exist, and that the uncritical use of the term without further specification is likely to lead to both terminological and theoretical confusion.

Notes

1. The author would like to thank the editors of this volume and two anonymous referees for helpful comments and suggestions. Any remaining shortcomings are entirely my own responsibility.
2. Abbreviations used in glosses: 1 first person, 2 second person, 3 third person, ABS absolutive, AFF affix, ANTIP antipassive, DEF definite, DEM demonstrative, ERG ergative, IND indicative, INDF indefinite, INS instrumental, INTR intransitive, IRR irrealis, LOC locative, MIN minimal number, OBJ object, OPT optative, PFV perfective, PL plural, POSS possessive, PST past, SBJ subject, SG singular, TR transitive.
3. The genetic affiliation of the Äiwoo language is unresolved. Lincoln (1978) argues that it should be assumed to be Austronesian, while Wurm (1978) claims that it is the result of an "incomplete takeover" of an Austronesian language by a Papuan-speaking population. Dryer (2005) does not recognize the proposed "East Papuan Phylum", to which Äiwoo has previously been assigned (Wurm 1982), and simply groups Äiwoo with the languages of nearby Santa Cruz island under the label "Reefs-Santa Cruz". The latter classification is followed here. Both in the *Ethnologue* (Gordon, ed. 2005) and in *The World Atlas of Language Structures* (Haspelmath et al. 2005) the name of the language is written "Ayiwo". This spelling is both phonemically inaccurate and based on a system of orthography whose use is declining in the language community. The spelling "Äiwoo" is based on fieldwork and discussions with speakers. All Äiwoo data are from the author's own field notes.
4. Person-marking in Äiwoo follows the rather unusual "unit-augmented" pattern (Cysouw 2003; Dunn, Reesink and Terrill 2002). Such a system has a basic person category 'you and I' ("1^{st}+2^{nd}" person) functioning on a par with 1^{st}, 2^{nd} and 3^{rd} person. The term "singular" is not appropriate for such a system as the 1^{st}+2^{nd} person category has no singular – it refers minimally to two people. Instead, the term "minimal number" is used for the number category which involves the minimal number of persons necessary to instantiate the person category (one in the case of the 1^{st}, 2^{nd} and 3^{rd} person, two in the case of the 1^{st}+2^{nd} person). Äiwoo has two further number categories: unit-augmented number, referring to minimal number plus one, and augmented number, referring to minimal number plus more than one. For details on the person-marking system in Äiwoo, see Næss (2006).

5. This does not appear to be an instance of a productive derivation of less transitive from more transitive verbs or vice versa. Although there are clear patterns to be found in the alternations between more-transitive and less-transitive verb forms, there is a large number of different possible patterns and no apparent predictability, nor is there a clearly identifiable direction of derivation.
6. The basic distinction between one-participant and two-participant events is apparently encoded in the grammar in all, or at least a great majority of languages (Dixon 1979: 102, 1994: 6–7). A third possible category in this domain would be that of three-participant events, as exemplified e.g., by acts of giving. However, not all languages show a corresponding formal construction used for the encoding of such events (a "ditransitive clause"), and it is not uncommon for such events to be encoded instead in formally (mono-)transitive clauses; see e.g., Newman (1998), Kittilä (2006).

References

Aissen, Judith
2003 Differential object marking: Iconicity vs. economy. *Natural Language and Linguistic Theory* 17: 435–483.

Bossong, Georg
1991 Differential object marking in Romance and beyond. In *New Analyses in Romance Linguistics: Selected Papers from the XVIII Linguistic Symposium on Romance Languages, Urbana- Champaign April 7–9, 1988,* Dieter Wanner, and Douglas A. Kibbee (eds.), 143–170. Amsterdam: John Benjamins.

Comrie, Bernard
1989 *Language Universals and Linguistic Typology*. Second edition. Oxford: Blackwell.

Cooreman, Ann
1994 A functional typology of antipassives. In *Voice: Form and Function*, Barbara Fox and Paul J. Hopper (eds.), 49–87. (Typological Studies in Language 27.) Amsterdam/Philadelphia: John Benjamins.

Croft, William
2003 *Typology and Universals*. Second Edition. Cambridge: Cambridge University Press.

Cysouw, Michael
2003 *The Paradigmatic Structure of Person Marking*. Oxford: Oxford University Press.

DeLancey, Scott
1987 Transitivity in grammar and cognition. In *Coherence and Grounding in Discourse*, Russel S. Tomlin (ed.), 53–68. (Typological Studies in Language 11.) Amsterdam/Philadelphia: John Benjamins.

de Swart, Peter
2003 The case mirror. MA thesis, University of Nijmegen.
Dixon, Robert M. W.
1979 Ergativity. *Language* 55: 59–138.
1994 *Ergativity*. Cambridge: Cambridge University Press.
Dixon, Robert M. W., and Alexandra Y. Aikhenvald
2000 Introduction. In *Changing Valency: Case Studies in Transitivity*, Robert M. W. Dixon and Alexandra Y. Aikhenvald (eds.), 1–29. Cambridge. Cambridge University Press.
Dryer, Matthew S.
2005 Genealogical language list. In *The World Atlas of Language Structures*, Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 584–644. Oxford: Oxford University Press.
DuBois, John W.
1987 The discourse basis of ergativity. *Language* 63: 805–855.
Dunn, Michael, Ger Reesink, and Angela Terrill
2002 The East Papuan languages: A preliminary typological appraisal. *Oceanic Linguistics* 41: 28–62.
Fortescue, Michael
1984 *West Greenlandic*. London: Croom Helm.
Givón, Talmy
2001 *Syntax*. Volume I. Amsterdam/Philadelphia: John Benjamins.
Gordon, Raymond G. Jr. (ed.)
2005 *Ethnologue: Languages of the World*. 15th ed. Dallas: SIL International.
Haspelmath, Martin, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.)
2005 *The World Atlas of Language Structures*. Oxford: Oxford University Press.
Hopper, Paul J., and Sandra A. Thompson
1980 Transitivity in grammar and discourse. *Language* 56: 251–299.
Kemmer, Suzanne
1993 *The Middle Voice*. (Typological Studies in Language 23.) Amsterdam/Philadelphia: John Benjamins.
Kittilä, Seppo
2006 The anomaly of the verb 'give' explained by its high (formal and semantic) transitivity. *Linguistics* 44: 569–612.
Lakoff, George
1977 Linguistic gestalts. In *Papers from the 13th Regional Meeting of the Chicago Linguistic Society*, Woodford A. Beach, Samuel E. Fox, and Shulamith Philosoph (eds.), 236–287. Chicago: CLS.
Lazard, Gilbert
2003 Transitivity revisited as an example of a more strict approach in typological research. *Folia Linguistica* XXXVI/3-4: 141–190.
Lincoln, Peter C.
1978 Reefs-Santa Cruz as Austronesian. In *Second International Conference on Austronesian Linguistics*, Stephen A. Wurm and Lois

Carrington (eds.), 929–967. (Pacific Linguistics C–61.) Canberra: Australian National University.

Mithun, Marianne
1984 The evolution of noun incorporation. *Language* 60: 847–894.

Newman, John
1998 Recipients and 'give' constructions. In *The Dative. Volume 2: Theoretical and Contrastive Studies,* Willy Van Langendonck, and William Van Belle (eds.), 1–28. (Case and Grammatical Relations Across Languages 3.) Amsterdam/Philadelphia: John Benjamins.

Næss, Åshild
2003 Transitivity: From semantics to structure. Ph.D. diss., University of Nijmegen.
2004 What markedness marks: The markedness problem with direct objects. *Lingua* 114: 1186–1212.
2006 *Stories From the Reef Islands: Äiwoo Texts with Translations*. (The Kon-Tiki Museum Occasional Papers 9.) Oslo: The Kon-Tiki Museum.
2007 *Prototypical Transitivity*. (Typological Studies in Language 72.) Amsterdam/Philadelphia: John Benjamins.

Primus, Beatrice
1999 *Cases and Thematic Roles: Ergative, Accusative and Active*. Tübingen: Niemeyer.

Robertson, John S.
1980 *The Structure of Pronoun Incorporation in the Mayan Verbal Complex*. New York: Garland.

Rosch, Eleanor
1978 Principles of categorization. In *Cognition and Categorization*, Eleanor Rosch, and Barbara B. Lloyd (eds.), 27–48. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Stassen, Leon
1985 *Comparison and Universal Grammar*. Oxford: Blackwell.

Topping, Donald M.
1973 *Chamorro Reference Grammar*. Honolulu: The University Press of Hawaii.

Wurm, Stephen A.
1978 Reefs-Santa Cruz: Austronesian, but...! In *Second International Conference on Austronesian Linguistics*, Stephen A. Wurm and Lois Carrington (eds.), 969–1010. (Pacific Linguistics C–61.) Canberra: Australian National University.
1982 *The Papuan Languages of Oceania*. (Ars Linguistica 7.) Tübingen: Gunter Narr.

From the typology of inversion to the typology of alignment

Fernando Zúñiga

1. Introduction: Inversion and alignment

The goal of this paper is to show that the typological investigation of inverse constructions has the added value of raising some questions concerning the typology of alignment. I present different typologies of inversion in Section 2, Section 3 is devoted to alignment types and some discussion thereof, and in Section 4 I make a number of observations that should help us refine our received notion of what alignment really is.[1]

Transitivity inversion or simply *inversion* is a complex and somewhat controversial notion. The following data illustrate what many scholars think of as a "canonical" inverse system, viz. the opposition between direct and inverse verb forms in Plains Cree.[2] The forms in (1a,c) are direct and show the direction morpheme (called "theme" in Algonquian studies)*-ā* ~ *-ē*, those in (1b,d) are inverse and have *-ikw* ~ *-iko* instead. These suffixes invariably appear in the so-called independent order (roughly, the verb forms used in main clauses):

(1) Plains Cree (Algic, Algonquian; Dahlstrom 1986: 68–70)

a. *ni-sēkih-ā-w*
1-frighten-DIR-3
'I frighten him'

b. *ni-sēkih-ikw-w*
1-frighten-INV-3
'he frightens me'

c. *sēkih-ē-w*
frighten-DIR-3
'he$_{prox}$ frightens him$_{obv}$'

d. *sēkih-ikw-w*
frighten-INV-3
'he$_{obv}$ frightens him$_{prox}$'

In Cree, interactions between speech act participants (SAPs) and third persons are obligatorily direct when the former act on the latter, and obligatorily inverse when it is the other way round. This is usually called semantic or obligatory inversion and is represented by (1) above. By contrast, with interactions between two third persons the speaker has some freedom to choose: when topical participants act on less topical ones, direct forms

are in order (1c), whereas inverse forms (1d) are adequate if the topical participants are acted upon by less topical ones. This is usually called pragmatic or optional inversion, and the topical or "higher" third person is called *proximate* and the less topical or "lower" one *obviative*. In Algonquian languages, there are also semantic and syntactic restrictions on obviation: animates outrank inanimates, possessors outrank possessees.

Finally, note that Plains Cree nouns are overtly marked for obviation but not for case. The information provided by the verb is enough for the hearer to know who did what to whom; the nominal obviation morphology helps identify coreference. This fact is, however, a specific characteristic of Algonquian languages (and of one of its neighbours, Kutenai), and is neither a sufficient nor a necessary condition for inversion, as many other languages show.

Alignment is normally defined, either explicitly or implicitly, as "the distribution of morphological markers or of syntactic or morphological characteristics; it is intended as a neutral way of referring to ergative, accusative, and other distributional patterns" (Harris and Campbell 1995: 240). Even though the notion of alignment is often treated as relatively unproblematic, there is no consensus as to which alignment types have to be recognized as basic and which as derived for cross-linguistic comparison. By the same token, alignment theories differ with respect to how these types are defined. (Which clauses have to be considered: intransitive, transitive, ditransitive, etc.? Should formally equipollent patterns be treated differently from formally privative ones?) A particular type sometimes called *hierarchical alignment*, which bears an intimate relationship to inversion, as we shall see in Section 3, will be at the center of attention in this paper. Siewierska's (1998) brief definition is representative of many studies that make use of this type: "the treatment of the A and O is dependent on their relative ranking on the referential and/or ontological hierarchies. Whichever is the higher ranking receives special treatment, the details of which vary from language to language" (1998: 10).

2. Typologies of inversion

There have been several proposals advanced in the typological literature as to how to best systematize both phenomena like the direct-inverse oppositions as found in the Algonquian languages and those that were seen as related to them in some fundamental, albeit sometimes rather complex, way

– e.g., active-passive alternations governed by conditions similar to those governing direct-inverse oppositions. Some of these proposals have treated the differences between passive constructions and inverse clauses as though they were primarily morphosyntactic (Klaiman 1991; Dixon and Aikhenvald 1997), whereas others have considered them to be basically of a pragmatic nature instead (Givón 2001; Thompson 1994). The stance I argued for in Zúñiga (2002) was different from both currents in that I regarded inversion as a deictic value. In what follows, I shall address only those proposals that have actually dealt with the typology of inversion.[3]

2.1. Inverse as a value of pragmatic ("de-transitive") voice (Givón 2001)

Givón (1994, 1995, 2001) and other scholars work with a functional continuum rather than with discrete, structurally distinct pigeonholes. Givón defines the three main prototypes of what he calls detransitive voice (with the active-direct construction as reference point) in deliberately vague terms: inverses (in which the undergoer is more topical than the actor, but the latter retains considerable topicality); passives (in which the undergoer is more topical than the actor, and the latter is extremely nontopical, "suppressed", "demoted"), and antipassives (in which the actor is more topical than the undergoer, and the latter is extremely nontopical, "suppressed", "demoted").[4]

Thus, the relevant parameter for Givón's de-transitive voices is relative topicality of the core arguments. No structural features can be used in order to tell these constructions unequivocally apart, but there are two measures (based upon text counts) that arguably correlate with topicality and have been used in several studies since Givón (1983): referential distance and topic persistence. Givón's detransitive voice framework shows a continuum in the form of a *relative topicality cline*:

(2)	a. Passive	A << O	c. Active direct	A > O
	b. Active inverse	A < O	d. Antipassive	A >> O

Inverse constructions vary along the following unordered parameters (Givón 2001: 91): (a) whether there is semantic (obligatory) inversion, pragmatic (optional) inversion, or both; (b) whether there are voice-marking morphemes on the verb, pronominal affixes on the verb, and/or case-markers on noun phrases; (c) whether the inverse is promotional (the

topical undergoer can be promoted to subject) or non-promotional (grammatical relations are the same as in the non-inverse clause), and (d) whether the inverse is morphological or encoded by word order. The different types that arise from this parametrization are not ordered in any particular way.

2.2. Inverse as an O-topicalizing detransitive voice (Thompson 1994)

Thompson (1994) takes a somewhat different approach to passives, antipassives and inverses from Givón and follows Shibatani (1988) in claiming that passives are basically actor-suppressing. He also draws a line between *voice systems* and *direction systems*: "in general voice systems (active, passive, antipassive) are defined by the degree to which they suppress arguments, while direction systems (direct, inverse) are defined by the degree to which a non-agent has an increase in topicality over the normal non-agent" (1994: 47). Moreover, "[i]f one looks at voice and direction from the point of view of relative topicality, the terms ACTIVE, PASSIVE, *antipassive, direct*, and *inverse* may be insufficient" (1994: 48, emphasis in the original).

Taking the active-direct voice as point of departure and with some given topicality value for both the actor (A) and the undergoer (O), Thompson characterizes the detransitive voices with a number of subtypes, as in Table 1. The symbols ↑ and ↓ represent 'more topical than in the active-direct voice' and 'less topical than in the active-direct voice', respectively.

Table 1. Detransitive voices (Thompson 1994)

I	A	O	active-direct
II	A↑	O↑	
III	A	O↑	inverse
IV	A↓	O↑	
V	A↓	O	passive
VI	A↓	O↓	
VII	A	O↓	antipassive
VIII	A↑	O↓	
IX	A↑	O	–

Thompson defines his inverses and antipassives based upon the topicality of the O as compared to its basic value in the active-direct construction: the inverse is O-topicalizing and has, in addition to the structural para-

meters proposed by Givón, three functional values, depending on whether the A is relatively topicalized or detopicalized, or remains unaltered.

By contrast, the antipassive is O-detopicalizing (with three functional subtypes according to the status of the A) and the passive is A-detopicalizing when compared with the active-direct construction. Observe that the construction exclusively specified for A-topicalization does not fit any of these categories and therefore remains unnamed. This is consistent with the view expressed by Thompson in an earlier study as to the primacy of function: "[p]assives and inverse constructions overlap in their marking of a deviation from the normal topicality relationship between an agent and a non-agent. It is best to be concerned with the functions and typology of such constructions rather than to battle over terminology and strict classification" (Thompson 1989: 269).

2.3. Direction as deixis (Zúñiga 2002, 2006)

I proposed in Zúñiga (2002, 2006) a set of unordered parameters along which inverse clauses can be characterized, partly based on earlier literature, and presented a series of inverse systems similar to the ones given in Gildea (1994), without addressing diachronic issues but exploring the possible systems in greater detail.

However, a major difference between the view of inversion in favor of which I argued in Zúñiga (2006) and the other views is related to the understanding of inversion and needs to be mentioned here. Instead of seeing inverse as either a particular cluster of structural properties or a particular set of values on the relative topicality cline, I preferred to regard inverse as a complex *deictic* value – a view based upon DeLancey's (1981a, 1981b, 1982) seminal work on the topic. Consider two hierarchies, viz. a grammatical one (where As outrank Os) and a "personal" one (where some referents outrank others, e.g, SAPs outrank third persons and proximates outrank obviatives); if the two are aligned, the value is direct, and if they are not, the value is inverse.

One important consequence of such a choice is that inverses neither structurally nor pragmatically compete with passives: a passive is a construction type that can express either deictic value, direct or inverse. In other words, inverseness and passiveness may be two different properties of one and the same clause, the former deictic and the latter morphosyntactic – although they need not cooccur in a given clause. Consequently, passive

constructions such as the *che*-marked verb together with the oblique-marked A in Southern Tiwa (3b) are inverses (the data are from Klaiman 1991: 219); the active-direct clause in (3a) is the only way to express that particular state of affairs (a structure corresponding to 'the man was seen by me' would be ungrammatical), as is the case with the passive-inverse in (3b): a structure literally corresponding to 'the man saw me' would be ungrammatical.[5]

(3) Southern Tiwa (Kiowa-Tanoan)

a. *Seuan-ide ti-mụ-ban.*
man-S 1SII-see- PST
'I saw the man.'

b. *Seuan-ide-ba te-mụ-che-ban.*
man-S-OBL 1SI-see-PASS-PST
'The man saw me.'

The parameters of inverse clauses I proposed in Zúñiga (2006) are the following: (a) locus of marking (head marking, dependent marking, detached marking, double marking); (b) direction domain (three scenario types: local, i.e., only SAPs are involved; non-local, i.e., only third persons are involved, and mixed, i.e., both a SAP and a third person are involved), and (c) focality and relationship to alignment and grammatical relations. The first two are directly comparable to some of the parameters mentioned above, while the third one needs some further explanation. Observe, however, that the parameter I call direction domains yields a number of additional possible types when compared to the result of the usual parameters [±semantic inversion] and [±pragmatic inversion]. Considering both identity vs. non-identity of marking and the existence of one or two of the three domains (mixed and local), I arrive at the following types, among others (note that the first three types can be seen as subtypes of the semantic inverse):

(4) a. Core direction I (only mixed direction);
b. Core direction II (both mixed and local direction, but marked differently);
c. Core-local direction (both mixed and local; with two subtypes, depending on which one of the local scenarios 1→2 and 2→1 is treated as direct and which as inverse);
d. Speech act participant A (all but SAP→3 are inverse), and
e. Speech act participant O (all but 3→SAP are direct).

Focality captures how specific or how vague direction markers are in terms of person, number, gender and/or obviation of both participants; some markers have a fairly general meaning (e.g., 'inverse') while others, which may occur in the same language, are quite specific (e.g., '1st singular acting on 2nd singular'). The values I tentatively proposed for this parameter are (i) non-focal (e.g., markers like Cochabamba Quechua *-su* 2O); (ii) low-focal (e.g., the typical unspecified direct and inverse markers of Plains Cree: *-ā*, *-ē*, *-ikw*, etc.); (iii) mid-focal (e.g., the *-im* suffix in Plains Cree, which marks 'direct', but only between non-adjacent persons on the person hierarchy), and (iv) high-focal (e.g., markers like Miami-Illinois *-ele* '1A>2O' or even Hungarian *-lAk* 1SA>2O).

Relationship to alignment and grammatical relations is, at least in part, similar to Givón's promotional vs. non-promotional parameter. Interesting values in this respect include whether grammatical relations are the same in the direct and inverse constructions (i.e., a purely morphological inverse), exactly the opposite (i.e., an inverse involving syntactic remapping between A and O on the one hand and subject and object on the other) or simply different (e.g., an inverse that is, syntactically speaking, a passive). Related to this is, of course, whether whatever grammatical relations are operative in a particular realm of the language where inversion can be observed behave accusatively, ergatively, etc.

3. The typology of alignment

The typologies of inversion presented in Section 2 cover a substantial range of the relevant structural phenomena found in a language like Plains Cree, but they do not address an issue that is necessary for an adequate understanding of how such complex systems work, viz. the relationship between inversion and alignment.[6] By the same token, although some alignment theories address languages showing a direct-inverse opposition of some sort, they do not normally elaborate on why they treat them the way they do, and how such a treatment informs the overall articulation of the alignment types and their interplay. A case in point is Plains Cree, which is seen as the paramount example of a type different from what is usually called neutral alignment due to the *behavior* of the verbal prefixes *ni-* '1st person', *ki-* '2nd person' and Ø- '3rd person' despite the fact that they are neutral *in form*.

In what follows, I present some taxonomies of alignment found in the literature and a preliminary sketch of a new proposal. I take only intransi-

tive and transitive clauses into account here, i.e., I operate with the three customary grammatical roles S, A, and O (S stands for the single argument of an intransitive verb, and A and O stand for the agentive and patientive argument of a transitive verb, respectively). A slash (/) means that the morphosyntax of a given language treats the two grammatical roles alike while a dash (–) means that it treats them differently.[7]

3.1. Sapir (1917)

Sapir (1917) was one of the first scholars to propose a typology of alignment types; these refer to "pronominal classification" (i.e., "the pronominal elements in conjugation") and are: accusative (S/A–O), ergative (S/O–A), split intransitive (S_A/A–S_O/O), tripartite (S–A–O,), and neutral (S/A/O). Sapir did not use the labels given here but made it clear that he meant precisely those systems. At the time he wrote his paper, his knowledge of Algonquian was limited and based upon early and fragmentary data from Blackfoot and Fox (1917: 70).

Observe that Sapir's account deviates from the logic suggested by a simple SAO model in two respects. First, the double-oblique pattern (S–A/O) does not occur. Nevertheless, Sapir simply happens to have found in North America the particular five types he lists, and his goal was not to formulate a complete taxonomy of either all logically possible types or all types attested around the globe (1917: 73). Second, the split intransitive pattern (S_A/A–S_O/O) introduces a further variable into the framework, viz. whether there are different types of intransitive clauses or not. Sapir also ventured some hypotheses as to the evolution of these types: he thought that the accusative pattern (S/A–O) was probably either simplified from the tripartite one (S–A–O) or represented an earlier stage thereof; he saw the neutral pattern (S/A/O) as a clear simplification of the accusative type, and he said that "there is a least some evidence to show that [the accusative type] tends to develop from [the split intransitive type]" (1917: 74).[8]

3.2. Mallinson and Blake (1981)

Mallinson and Blake (1981: 7) advanced a similar typology, but they explicitly distinguished between the dependent marking and head marking patterns.[9] Another respect in which this typology differs from Sapir's is that

instead of the neutral type (S/A/O) there are two complex patterns, viz. the Philippine case marking system and the inverse verb marking system. Moreover, Mallinson and Blake postulate three "mixed" types: "split systems", "limited accusative marking", and "relative hierarchical marking". Interesting though Philippine case systems are, I will not discuss this type here and address the inverse and the three mixed patterns in what follows.

(5)	Dependent marking	Head marking	
	a. Accusative	a. Accusative	S/A–O
	b. Ergative	b. Ergative	S/O–A
	c. Split intransitive	c. Split intransitive	S_A/A–S_O/O
	d. Tripartite	d. Tripartite	S–A–O
	e. Philippines-type	–	topic-subject–A/O
	–	e. Inverse	*

The inverse head marking type operates based upon a nominal hierarchy; according to Mallinson and Blake (1981: 58), this hierarchy is 1 > 2 > 3 proximate > 3 obviative, although "it is not certain that 1 should precede 2" (p. 116). The forms cited consist of suffixal material from Plains Cree and, although direct forms are said to be used when a higher argument acts on a lower one and the inverse ones if it is the other way round, they are considered "not completely analyzable" (p. 59). Mallinson and Blake's account of the data and their significance, however, is extremely cursory; they illustrate the direct-inverse opposition with the following forms: (1) direct: 1S→3S *-aw,* 1S→3P *-awak,* 1P→3S *-anan,* 1P→3P *-ananak,* 3PROX→3OBV *-ew*; (2) inverse: 3S→1S *-ik,* 3P→1S *-ikwak,* 3S→1P *-ikonan,* 3P→1P *-ikonanak,* 3OBV→3PROX *-ik.*[10]

Mallinson and Blake's three "mixed types" are particularly interesting in the present context – especially their third pattern. What they call *split systems* refers to the fact that a number of languages display ergative case alignment with some tense/aspect/mood forms and accusative case alignment with others. Second, there is *limited accusative marking* when the O is marked only under certain circumstances, e.g., when it is definite, specific, or animate. Additionally, it may be the case that some persons (e.g., SAPs) follow an accusative pattern while others (third person) work ergatively. In some languages, Os might be marked differently according to how completely affected they are by the state of affairs depicted by the predicate.[11] Finally, the principle of *relative hierarchical marking* is at work when differences in marking do not depend on the arguments' abso-

lute position on a hierarchy (e.g., SAPs always accusative, third person always ergative) but on their relative position (e.g., SAPs marked differently depending on whether the other argument is a SAP or a third person). Let us turn to this latter type in detail through the examples given by Mallinson and Blake in their discussion.[12]

In Rembarrnga, there appears an "accusative marker" *n-* on the verb when the A is lower than the O on the hierarchy 1 > 2 > 3P > 3S:[13]

(6) Rembarrnga (Australian, Gunwinyguan; Mallinson & Blake 1981: 66)

a. *Pa-ŋa-na.*
3P-1S-saw
'I saw them.'

b. *Ŋa-**n**-pa-na.*
1S-**ACC**-3P-saw
'They saw me.'

In Dargwa, the verb agrees with the first or second person irrespective of whether it is A or O, unless the interaction is of the type 1↔2, in which case the verb agrees with the O:

(7) Dargwa (Nakh-Daghestanian, Lak-Dargwa; Mallinson & Blake 1981: 67)

a. *hit γu-ni* *wäkilli*
3S 2S-ERG made:**2S**
'You$_s$ made him.'

b. *hit nu-ni* *wäkilla*
3S 1S-ERG made:**1S**
'I made him.'

c. *γu nu-ni* *wäkilli*
2S 1S-ERG made:**2S**
'I made you$_s$.'

d. *nu γu-ni* *wäkilla*
1S 2S-ERG made:**1S**
'You$_s$ made me.'

In Fore, the A and O arguments are marked by word order alone (AOV) when none is higher than the other on the hierarchy pronoun / proper name / kinship term > human > animate > inanimate, but when both arguments differ, the lower A takes the suffix *-ma* if human and *-wama* if non-human, and word order is no longer rigid:

(8) Fore (Trans-New Guinea, Eastern Highlands; Mallinson & Blake 1981: 68)

a. *Yagā wá aegúye.*
pigman he.hits.him
'The man kills the pig.'

b. *Yagā-**wama** wá aegúye.*
pig-**AGT** man he.hits.him
'The pig attacks the man.'

Finally, Umatilla Sahaptin "reveals a 1, 2 > 3 hierarchy in a clitic system" (Mallinson and Blake 1981: 69) since first and second persons are

marked via Wackernagel clitics but third persons are not. The following paradigm shows the oppositions in dependent and head marking:[14]

(9) Umatilla Sahaptin (Penutian, Sahaptian; Mallinson & Blake 1981: 69)

	clitics	verb prefix	A case	O case
1↔2	✓	–	–	*-nay*
1/2→3	✓	*(á-)*	–	*(-na)*
3→1/2	✓	*i-*	*-nïm*	*-nay*
3↔3	–	*pá-*	*-in*	*-na*
	–	*i-*	–	*(-na)*

Observe that Mallinson and Blake's relative hierarchical marking is, as far as locus of marking is concerned, a fairly heterogenous type: it covers head marking additional to the person marking affixes as in Rembarrnga, hierarchical conditions governing head marking as in Dargwa, specialized dependent marking as in Fore, and detached marking as in Umatilla Sahaptin (where it involves both head and dependent marking patterns). This issue shall be addressed again in Section 4.

3.3. Nichols (1992)

Nichols' (1992) taxonomy is comparable to Mallinson and Blake's in that it treats the Cree system and those similar to it separately:

(10)

a. Accusative	S/A–O	d. Split intransitive	S_A/A–S_O/O
b. Ergative	S/O–A	e. Neutral	S/A/O
c. Tripartite	S–A–O	f. Hierarchical	*

Nichols describes her hierarchical type (12f) as follows:

> Access to inflectional slots for subject and/or object is based on person, number, and/or animacy rather than (or no less than) on syntactic relations. The clearest example of the hierarchical type in my sample is Cree. The verb agrees in person and number with subject and object, but the person-number affixes do not distinguish subject and object; that is done only by what is known as direct vs. inverse marking in the verb. There is a hierarchical ranking of person categories: second person > first person > third person. The verb takes direct marking when subject outranks object in this hierarchy, and inverse marking otherwise. In addition, verbs inflect differ-

> ently depending on whether their S and O arguments are animate or not, a pattern which could be viewed either as another instance of hierarchical agreement or as different conjugation classes (rather than hierarchical access to agreement slots). (Nichols 1992: 66)

Notably, however, hierarchical alignment is not to be seen as entirely on a par with the other types as the preceding passage might suggest:

> To judge from my database, most hierarchical languages also have an identifiable accusative, neutral, or stative-active component. We may speak of hierarchical languages, like stative-active languages, as admitting various base alignments, at least in theory. In reality, to judge from my sample, the hierarchical alignment on an ergative base does not occur. In the clearest examples of the hierarchical type, such as Cree and Nunggubuyu, the base morphological alignment is simply neutral, in the sense that subject and object categories are not distinguished except by direct/inverse marking. For Cree, there is an additional accusative component to the morphosyntax revealed in the active/passive opposition. (Nichols 1992: 68)

Thus, hierarchical alignment is a complex pattern operating on the "base" of other patterns, like accusative and neutral according to Nichols' account of the languages in her sample. This fact, as well as the heterogeneity of the type as illustrated in 3.2 above, is the subject of the next section.

4. Discussion

The typologies sketched in Section 3 agree in considering accusative (S/A–O), ergative (S/O–A) and tripartite patterns (S–A–O) "basic" in some sense. Whereas split ergativity is a typical example of a derived pattern, the Philippines-type and the inverse/hierarchical are presented as either residual (Mallinson and Blake) or complex (Nichols).

Some interesting issues arise in this context. First, why include two types of S (S_A and S_O) but not different types of A and/or different types of O as well? Differential subject marking, but also especially differential object marking, are widespread phenomena that naturally enter the picture at this point. The inclusion of the split intransitive pattern among the basic types naturally motivates the addition of other types arising from the consideration of different types of transitive clauses – which in turn naturally leads to the extension of the model so as to either add two more clause types (in Dixon's terms: an extended intransitive clause [S E] and an ex-

tended transitive one [A O E]) or encompass ditransitive clauses (and possibly also those with intermediate transitivity values) along traditional lines.

Most importantly, the "other" types can be seen either as combinations of the basic ones (e.g., split ergativity) or as patterns consisting of a basic alignment type (which may be neutral) plus some kind of addition, like marking patterns that are subject to hierarchical conditions. The next section discusses the treatment given to inverse systems in this light.

4.1. Hierarchical as a broad and unspecific alignment type

In order to illustrate why the hierarchical alignment type (i.e., Nichols' hierarchical type, but also Mallinson and Blake's inverse and relative hierarchical types) is best seen as a different category from, say, the accusative type, I will briefly discuss some less well-known but crucial features of Plains Cree morphosyntax here.

First, as repeatedly noted in the literature, personal prefixes ocurring in the independent order of verbs follow a neutral (S/A/O) pattern:

(11) Plains Cree (Algic, Algonquian)

a.	b.	c.
ni-*pimipahtā-n*	***ni-****sēkih-ā-w*	***ni-****sēkih-ikw-w*
1-run-1S/2S	**1**-frighten-DIR-3	**1**-frighten-INV-3
'I run'	'I frighten him'	'he frightens me'

The prefixes *ni-* '1st person', *ki-* '2nd person' and Ø- '3rd person' work alike: irrespective of whether the argument is in S (a), A (b) or O (c) function, their form is the same. Note, however, that the neutral pattern refers to the *form* of the prefixes, not to their *occurrence*: *ki-* '2nd person' outranks *ni-* '1st person' (and both markers in turn outrank Ø- '3rd person'): 'you frighten me' is *ki-sēkihin*, 'I frighten you' is *ki-sēkihitin*.[15]

Second, there is a suffix *-(i)yi* that follows an accusative (S/A–O) pattern. This suffix coreferences obviatives whose grammatical role is S or A, i.e., it is an "obviative subject" marker:[16]

(12) Plains Cree (Algic, Algonquian)

a.	b.
*pimipahtā-****yi****-w-a*	*ni-sēkih-iko-****yi****-w-a*
run-**YI**-3-OBV	1-frighten-INV-**YI**-3-OBV
'he$_{obv}$ runs'	'he$_{obv}$ frightens me'

c. *ni-sēkih-im-ā-w-a*
1-frighten-SDIR-DIR-3-OBV
'I frighten him$_{obv}$'

Third, there are verbal suffixes (called "finals" in Algonquian studies) that are lexically determined, often include some additional specific meaning (e.g., 'with the hand' or 'benefactive'), and follow a tripartite pattern (S—O—A). They agree with the animacy of the argument in S function: the root *kanāt-* 'clean (adj.)' can be turned into intransitive stems fit for predications of either inanimates (with *-an*: *kanāt-ān* 'it is clean') or animates (with *-isi*: *kanāt-isi-w* 'he is clean'). A different class of these suffixes also agrees with the animacy of the argument in O function: *kīs-* 'complete (adj.)' can be turned into transitive stems for either inanimate Os (with *-(i)htā*: *kīs-ihtā-w* 'he completes it') or animate Os (with *-(i)h*: *kīs-ihē-w* 'he$_{prox}$ completes him$_{obv}$').

Fourth, there are a number of personal suffixes that are neutral as to form like the prefixes, but whose occurrence is governed by a personal hierarchy that is different from the one that governs the prefixes. The first person exclusive (1PE) suffix *-yāhk* outranks all other suffixes that might appear in the same slot in the conjunct order: whenever a first person exclusive argument is present (in any function: S, A, or O), this suffix appears; the second person plural suffix *-yēkw* comes next, appearing in that form whenever a second person plural argument is involved and no 1PE argument is present, and so on.

Thus, the "hierarchical type" as analytical tool – even when applied to head marking in a single language like Plains Cree – turns out to cover fairly diverse phenomena. First, there is the issue of access to marking slots: personal affixes occurring in a determined slot of the verb template may do so according to a hierarchy; this phenomenon does not require the form of the affixes to follow a neutral pattern, since they might be specialized for grammatical role, and Plains Cree shows that different templatic positions may be governed by different hierarchies. Second, there is the issue of specialized markers that denote whether the actional or personal hierarchy (e.g., 1/2 > 3PROX > 3OBV) and the grammatical role hierarchy (A > O) are aligned or not, irrespective of the behavior of the personal markers; these specialized markers can be, at least in principle, as different as verbal affixes, nominal suffixes, adverbials, etc. Third, there is the question of inverses that do not conform to the Plains Cree or Algonquian prototype and are, either according to Givón's understanding of inverse or mine, construc-

tions that are, e.g., passive-like – something that leads to an explicit account of the voice system as a whole and not only of individual clause structures. Fourth, some or all of these phenomena may be found in one and the same language, resulting in a very complex picture.

When Mallinson and Blake and Nichols postulated alignment types that dealt with the constructions found in Algonquian(-like) languages, they did not intend their frameworks to encompass all the intricacies and details of their morphosyntax but were proposing a notion capable of capturing some of the distinctive features of such systems instead. In a simple sense, labels such as "accusative" and "ergative" tell us what sort of marking or behavior system we might expect in a particular realm of a given language, and so does "hierarchical". Nevertheless, the accusative, ergative and tripartite types – when understood as basic – habitually imply an additional condition imposed on how the system works, viz. the *absence* of conditioning factors like a semantic, pragmatic and/or grammatical ranking of arguments. Thus, a pattern like the one called differential object marking (i.e., the fact that Os higher in animacy and/or determinacy are marked differently) would usually be seen as derived or more complex – but as a subtype or combination of what, exactly: accusative, hierarchical, or other?

In my opinion, a typology of alignment that works with types that are as heterogenous as neutral, ergative, split intransitive and hierarchical is less powerful an analytic tool than it should be. Even a morphosyntactic definition of inverse clauses leads to the observations sketched in this subsection, but frameworks like Givón's and mine do so in a more explicit way, due to the parametrization of inverses according to both marking locus and syntactic import. The next subsection proposes a number of lines along which a more principled typology might be formulated.

4.2. How to define basic alignment types

The traditional understanding of alignment is about what Givón calls the coding properties of grammatical relations (morphological markers and word order): how are different arguments treated formally as they occur in, or across, several different clause types? Therefore, the first crucial dimension is the *locus of marking*: is a particular function marked on nominals, predicates, or elsewhere? The second is the *form-function correspondence* of the markers: which values are treated alike, which are distinguished, and how? The third question bears relationship to the *conditions* of marking: is

a particular argument marked only if another argument is (not) present (like with Plains Cree suffixes), does the marking of an argument depend on its own semantic, referential or grammatical properties only (like with differential object marking, or person-based split ergativity), or do the other arguments' properties play a role (like with Sahaptin case markers)? Finally, and most fundamentally, it is necessary to model *clause types* in a useful, coherent and precise way: how many clause types are there, and how are they defined?

To my knowledge, such a list of basic relevant questions has seldom been formulated in the typological literature in a way that is both explicit and sufficiently rigorous. In particular, too little attention has been paid to the best possible way in which to integrate the conditions of marking into the picture, and the question of what counts as a distinct clause type is omitted more often than not. Only after acknowledging and accurately describing all relevant clause types in terms of number, type and form of arguments that they feature are we in a position to deal with the other three questions, and the issue of conditions of marking has been problematic in the past because some hierarchical phenomena have been taken into account in an ad-hoc fashion.

What does this mean for the analysis of inverse systems? Instead of working with a framework that integrates some or all complex types into the general list of patterns, it is possible to work with a theory that works, at least to certain extent, along the lines of Mallinson and Blake's taxonomy; i.e., defining a limited number of basic alignment types on the one hand and some additional factors (e.g., hierarchies and tense/aspect/mood values) that lead to more complex types on the other. More about general issues, as well as evidence in favor of the latter view of alignment, is found (Bickel and Zúñiga, forthcoming). In what follows I will limit myself to sketching one possible formulation of such a framework, designed in order to more powerfully capture some crucial differences between inverse systems.

For Plains Cree, two basic clause types – intransitive [S] and transitive [A O] – and probably one extended type [A F G] (where F and G are shorthand for the figure-like or secondary argument and the ground-like or primary argument, respectively) do the job. As far as the locus of marking is concerned, all relevant information is marked on the verbal predicate. As to the form of the markers involved, at least the following templatic slots must be distinguished: prefix, stem-deriving suffix of "final", direction suffix or "theme", obviative subject suffix, and personal suffix. As to the conditions of marking, the prefixes follow one hierarchy, the suffixes follow a differ-

ent one, the stem-deriving suffixes are orthogonal to orderings and the direction markers are sensitive to yet another ranking. This information is summarized in Table 2:

Table 2. Plains Cree alignment patterns (simplified)

	Personal Prefixes	"Finals"	"Theme"	Obv. Subj. Suffix	Personal Suffixes
Locus	(— — — — — — — — Head marking — — — — — — — —)				
Form-function	Neutral (S/A/O)	Tripartite: S–O–A	a. direct b. inverse c. 1→2 d. 2→1	Accusative: S/A–O	If 1P/2P↔3: neutral S/A/O If 1S/2S↔3: port-manteaus
Conditions	Hierarchy 2 > 1 > 3	Allomorphy: {S} and {O} lexically determined	Hierarchy 1/2 > 3PROX > 3OBV	Allomorphy: Ø ~ *-wā* if O is 1P/2P; *-(i)yi* elsewhere	Hierarchy 1P/2P > 3ANIM > 1S/2S > 3INAN

The characterization in Table 2 is explicitly intended as a more refined account of part of the complex marking system of Plains Cree. Since inverse marking can evolve out of directional morphology and other personal or case markers (cf. Gildea 1994; Zúñiga 2006, ch. 5), it is useful to have a framework that is both detailed and simple enough in order to analyse diachronic paths as well. Not only does the broad and heterogeneous category labeled "hierarchical type" render a general typology of alignment rather messy but it also does not do justice to the intricacies inverse systems can display.

Summing up: I would like to postulate only five basic alignment types when only two clause types (intransive and transitive) are considered: accusative (S/A–O), ergative (S/O–A), double-oblique (S–A/O), tripartite (S–A–O) and neutral (S/A/O). Next, we distinguish different sorts of intransive and transitive clauses if needed, which leads to split systems. Finally, we can systematize different kinds of additional conditions or conditioning factors that further inform case and/or agreement systems, as well as the make-up of syntactic pivots; one of such conditioning factors is the existence of one or more nominal hierarchies active in the language for morphosyntactic purposes. Other conditioning factors would include non-ranked semantic or pragmatic properties of nominals and tense/aspect/mood values, which in turn would lead to other types of splits.

4.3. Yes, but how many typologies, really?

I have argued here in favor of the idea that, if we want to better understand linguistic phenomena like inverse clauses, thinking of syntactic parameters of such clauses is both relevant and illuminating. Such a move leads to a more explicit way of thinking about grammatical relations and alignment patterns not only in a particular language but also in more general terms, but I do not believe that the most useful characterization of all these notions is one that blurs the boundaries between them. On the contrary: the inquiry into the typology of inversion is one of several roads that lead to an inquiry into the typology of alignment, without one of them merely including the other as a special case. Further research will be more fruitful if it treats the typologies of grammatical relations, alignment patterns and inverse constructions as intimately connected but fundamentally different.

Notes

1. A more thorough discussion of some fundamental related questions is found in Bickel and Zúñiga (forthcoming). I am grateful to Matti Miestamo, Bernhard Wälchli and two anonymous reviewers for their very valuable comments at early stages of this paper. The abbreviations used in the glosses of this paper are: A actor, ACC accusative, ANIM animate, AGT agent, DIR direct, E exclusive, E extended argument, ERG ergative, I person marker set I, II person marker set II, INAN inanimate, INV inverse, O undergoer, OBL oblique, OBV obviative, P plural, PASS passive, PROX proximate, PST past, S singular, SDIR strong direct.
2. A substantial part of the discussion of inversion issues in this paper focuses on Plains Cree data. The sources are Wolfart (1973: 15–16, 1996) and Dahlstrom (1986: 69–70); details of the analysis are found in Zúñiga (2006).
3. Interesting though Fadden's (2000) "inverse continuum" and Gildea's (1994) "cycle of inverse evolution" are, I have omitted them here because they are only marginally relevant for the purposes of this paper.
4. Observe that Givón (1981) had already rejected a structural definition of the passive in favor of a functional characterization. Instead of focusing on structural properties like actor demotion and undergoer promotion, passives were defined in terms of three functional domains, viz. topicalization of the non-actor, impersonalization (i.e., detopicalization of the actor), and detransitivization of the predicate. Consequently, constructions that were actor-suppressing or undergoer-promoting were seen as special cases of the more general function "passive".

5. It is not entirely clear how prototypical a passive a construction like (5b) is in syntactic terms, even though the morphology suggests it is: in addition to the oblique case and the *che*-suffix on the verb, set II prefixes (here: *ti-*) occur with transitives while those of set I (here: *te-*) appear on intransitives. Be it as it may, the fact that both semantic (1/2↔3) and pragmatic inversion (3PROX↔3OBV) occur suffices according to this particular account, and so Southern Tiwa can meaningfully be said to have a direct-inverse opposition.
6. The parameter called "relationship to alignment and grammatical relations" in Zúñiga (2006, ch. 2) focused on the question of grammatical relations but neglected the problem of alignment.
7. Such a model has a number of limitations that cannot be adequately addressed here. Furthermore, the inclusion of both ditransitive clauses and clauses of intermediate transitivity values is a meaningful and, possibly, a necessary step in order to arrive at a more comprehensive typology of alignment. Finally, I have disregarded here taxonomies that do not deal with inverse phenomena (except Sapir 1917 in 3.1), viz. Harris and Campbell's (1995: 240–241) five types accusative, ergative, split intransitive, tripartite and double oblique; Plank's (1985) three basic types accusative, ergative and split intransitive (with the double oblique pattern as a sort of intermediate case); Dixon's (1994) three types accusative, ergative and tripartite (plus his "split systems"), and Song's four basic alignment types accusative, ergative, double oblique, and neutral (plus the split intransitive, the split ergative and the direct-inverse systems with a tentative comment: "[t]hese additional [types] can be perhaps be regarded as more complicated or less straightforward than [the other logically possible simple types]"; 2001: 147).
8. An influential study by Fillmore (1968) adopted all five types of Sapir's taxonomy as possible patterns not only of verbal marking but also of case marking, anaphora conditions, topicalization processes and word order issues. Other authors (Klimov 1985, 1986; Palmer 1994; and Givón 2001) work with a subset of Sapir's types instead: accusative, ergative and split intransitive.
9. Mallinson and Blake's labels are somewhat different from the ones used here for all aligment types. In addition, instead of the labels dependent marking and head marking, Mallinson and Blake use "direct marking" and "indirect marking", respectively.
10. Plains Cree verb forms are better understood nowadays than what this analysis suggests, and some brief corrections are in order. As already shown in Examples (1) and (2) above, the direct set is characterized by the direct theme suffix *-ā*, which stands in opposition to the direct theme suffix *-ē* (which appears when only third persons are involved in the so-called independent order), and especially to the inverse theme suffix *-iko* ~ *-ikw* that appears in the inverse set. The third person suffix *-w* appears not only in the first two direct forms but also in the first two inverse ones (i.e., *-ik* is underlyingly *ikw-w* and *-ikwak* is *-ikw-w-ak*), and the first and third person plural are marked by *-nān* and *-ak* re-

spectively. The suffixal material given by the authors is a very small subportion of the complete paradigm, and all forms are completely analysable.

11. Note that, despite the analogies between such patterns and split intransitive clauses, Mallinson and Blake did not treat these two phenomena on a par.
12. The sources given by Mallinson and Blake are the following: McKay (1975) for Rembarrnga, Wierzbicka (1981) for Dargwa, Scott (1978) for Fore, and Rigsby (1974) for Sahaptin.
13. For a more up-to-date account of some aspects of Rembarrnga morphosyntax see Saulwick (this volume).
14. Regarding these data, which appear with only brief comments by Mallinson and Blake, subsequent work on Umatilla Sahaptin (e.g., Rigsby and Rude 1996) has shown that a more accurate picture is the following:

	clitics	verb prefix	A case	O/G case
1↔2	✓	–	–	objective
1/2→3	✓	*á-*	–	(objective)
3→1/2	✓	*i-*(3S) / *pa-*(3P)	*-nïm*	objective
3→3P	–	*i-*(3S) / *pa-*(3P)	–	objective
3→3S.OBV	–	*i-*(3S) / *pa-*(3P)	–	objective
3→3S.PROX	–	*pá-*(3S) / *patá-*(3P)	*-in*	objective

"Objective" corresponds to the case marking of primary object (covering Os and Gs), which in 1/2→3 interactions appears obligatorily with human Os. The suffix *-nïm* is called "inverse ergative", and *-in* is labeled "obviative ergative". When both arguments are third person and the non-agentive one is singular, the latter may be more salient than the agentive argument, in which case the verbal prefix *pá-* appears instead of *i-* if the A is singular and *patá-* appears instead of *pa-* if the A is plural.

15. I am glossing over a grammatically conditioned allomorphy of the third person markers here (Ø- ~ *o-*), as well as a phonologically conditioned allomorphy of the markers in general; these alternations bear no relationship to our present concern.
16. The allomorphy *-(i)yi* ~ Ø ~ *-wā* will be addressed further down in the text; the latter two allomorphs occur when the O is a plural SAP (Ø in the independent and *-wā* in the conjunct order). Cf. Wolfart (1996) for more details.

References

Bickel, Balthasar, and Fernando Zúñiga
forthc. Beyond alignment: Referential properties of arguments and the typology of clause structure. Ms.

Dahlstrom, Amy
1986 Plains Cree morphosyntax. Ph. D. dissertation, University of California at Berkeley.
DeLancey, Scott
1981a The category of direction in the Tibeto-Burman verb. *Linguistics of the Tibeto-Burman Area* 6(1): 83–101.
1981b An interpretation of split ergativity and related patterns. *Language* 57(3): 626–657.
1982 Aspect, transitivity and viewpoint. *Tense-Aspect: Between Semantics and Pragmatics*, Paul Hopper (ed.), 167–183. Amsterdam: Benjamins.
Dixon, Robert M. W.
1994 *Ergativity*. Cambridge: Cambridge University Press.
Dixon, Robert M. W., and Alexandra Aikhenvald
1997 A typology of argument-determined constructions. In *Essays on Language Function and Language Type. Dedicated to T. Givón*, Joan Bybee, John Haiman, and Sandra Thompson (eds.), 71–113. Amsterdam: Benjamins.
Dixon, Robert M. W., and Alexandra Aikhenvald (eds.)
2000 *Changing Valency*. Case studies in transitivity. Cambridge: Cambridge University Press.
Fadden, Lorna
2000 The inverse continuum. M.A. thesis, Simon Fraser University.
Fillmore, Charles
1968 The case for case. In *Universals in Linguistic Theory*, Emmon Bach, and Robert Harms (eds.), 1–88. New York: Holt, Rinehart & Winston.
Gildea, Spike
1994 Semantic and pragmatic inverse: 'Inverse alignment' and 'inverse voice' in Carib of Surinam. In *Voice and Inversion*, Talmy Givón (ed.), 187–230. Amsterdam: Benjamins.
Givón, Talmy
1981 Typology and functional domains. *Studies in Language* 5 (2): 163–193.
1994 The pragmatics of de-transitive voice: Functional and typological aspects of inversion. In *Voice and Inversion*, Talmy Givón (ed.), 3–44. Amsterdam: Benjamins.
1995 *Functionalism and Grammar*. Amsterdam: Benjamins.
2001 *Syntax. An Introduction*. 2 vols. Amsterdam: Benjamins.
Givón, Talmy (ed.)
1983 *Topic Continuity in Discourse: A Quantitative Cross-Linguistic Study*. Amsterdam: Benjamins.

Harris, Alice, and Lyle Campbell
1995 *Historical Syntax in Cross-Linguistic Perspective*. Cambridge: Cambridge University Press.
Klaiman, Miriam H.
1991 *Grammatical Voice*. Cambridge: Cambridge University Press.
1992 Inverse languages. *Lingua* 88 (3/4): 227–261.
Klimov, Georgij
1985 Zur kontensiven Typologie [= On contensive typology]. In *Relational Typology*, Frans Plank (ed.), 175–191. Berlin/New York: Mouton de Gruyter.
1986 On the notion of language type. In *Language Typology 1985,* Winfred Lehmann (ed.), 105–110. Amsterdam: Benjamins.
Mallinson, Graham, and Barry Blake
1981 *Language Typology. Cross-Linguistic Studies in Syntax*. Amsterdam: North-Holland.
McKay, Graham R.
1975 Rembarnga, a language of central Arnhem Land. Ph.D. dissertation, Australian National University.
Nichols, Johanna
1992 *Linguistic Diversity in Space and Time*. Chicago: University of Chicago Press.
Palmer, F. R.
1994 *Grammatical Roles and Relations*. Cambridge: Cambridge Univresity Press.
Plank, Frans (ed.)
1985 *Relational Typology*. Berlin/New York: Mouton de Gruyter.
Rigsby, Bruce
1974 Sahaptin grammar. Ms.
Rigsby, Bruce, and Noel Rude
1996 Sketch of Sahaptin, a Sahaptian language. In *Handbook of North American Indians*, Vol. 17, Languages, Ives Goddard (ed.), 666–692. Washington: Smithsonian Institution.
Sapir, Edward
1917 Review of C.C. Uhlenbeck, "Het passieve karakter van het verbum transitivum of van het verbum actionis in talen van Noord-Amerika". *International Journal of American Linguistics* 1: 82–86.
Saulwick, Adam
this vol. Rembarrnga polysynthesis in cross-linguistic perspective.
Scott, Graham
1978 *The Fore Language of Papua New Guinea*. Canberra: Pacific Linguistics.
Shibatani, Masayoshi (ed.)
1988 *Passive and Voice*. Amsterdam: Benjamins.

Siewierska, Anna
1998 On nominal and verbal person marking. *Linguistic Typology* 2: 1–56.
Song, Jae Jung
2001 *Linguistic Typology. Morphology and Syntax*. London: Longman.
Thompson, Chad
1989 Voice and obviation in Athabaskan and other languages. Ph.D. diss., University of Oregon.
1994 Passive and inverse constructions. In *Voice and Inversion*, Talmy Givón (ed.), 47–63. Amsterdam: Benjamins.
Wierzbicka, Anna
1981 Case marking and 'human nature'. *Australian Journal of Linguistics* 1: 43–80.
Wolfart, H. Christoph
1973 Plains Cree: A grammatical study. *Transactions of the American Philosophical Society* 63 (5). Philadelphia.
1996 Sketch of Cree, an Algonquian language. In *Handbook of North American Indians*, Vol. 17, Languages, Ives Goddard (ed.), 390–439. Washington: Smithsonian Institution.
Zúñiga, Fernando
2002 Inverse systems in indigenous languages of the Americas. Ph.D. diss., University of Zurich.
2006 *Deixis and Alignment. Inverse Systems in Indigenous Languages of the Americas*. Amsterdam: Benjamins.

Part IV. Pronominals

Building semantic maps: The case of person marking

Michael Cysouw

1. Introduction

When comparing languages, a method is needed to deal with variability. Semantic maps are a frequently used method in typology to analyse and display cross-linguistic diversity. In my dissertation on the paradigmatic structure of person marking, I made a semantic map of person marking to summarize some structural aspects of my findings (Cysouw 2001a: 185–187). However, the resulting map was not very satisfying, and I subsequently removed this attempt in the published version of my thesis (Cysouw 2003). In this chapter,[1] I will revisit the attempt to build a semantic map for person marking, based on the data as discussed in detail in Chapters 3 and 4 from Cysouw (2003). My main conclusion will be that there is no such thing as the semantic map for person marking. Instead, various semantic maps are possible, and the traditional kind of semantic map should be seen as just one possible display of cross-linguistic variability. More generally, I will criticize the received view on establishing semantic maps (as summarized in Haspelmath 2003) because frequency of occurrence is ignored in that tradition.

In Section 2, I will first discuss why there is a need for semantic maps and what the methodological status of this approach is in linguistic theory. Following this, in Section 3, I will turn to person marking, which will be the example I will use in this chapter to illustrate my arguments. I will first make a semantic map for person marking along the received approach, and then sketch various ways to improve on this by including frequencies of occurrence. Section 4 will outline some possibilities of using similar approaches on different levels of linguistic structure. A summary and an outlook on further possible developments will be given in Section 5.

2. Background and some terminology

The basic impetus for building semantic maps is the variability of linguistic structure among the world's languages. Elements of a language, be it lexemes, grammatical morphemes, or syntactic constructions, all show lan-

guage-specific characteristics. It is therefore difficult, if not impossible, to equate two such elements from different languages. For example, the English verb *to fly* is normally translated with the German *fliegen*, but these two lexemes are not identical in all their nuances and idiomatic usages. In the case of such a lexical example, probably nobody would doubt the inherent cross-linguistic variability. However, detailed descriptive work and much cross-linguistic research from the last few decades has shown time and again that the same cross-language incompatibility also exists at all other levels of language structure. This variability poses a problem to large-scale language comparison, because what should be compared with what, when everything is different?

The solution to this problem as used in typological research is to refer to a *tertium comparationis*, normally in the form of a semantically or functionally defined extra-linguistic concept, as the basis of the cross-linguistic comparison. The basic goal of a semantic map is to sketch out the relations between various such *tertia comparartionis* as established by the cross-linguistic variability of their structural encoding among the world's languages. As an example, consider the semantic map of indefinite pronouns in Figure 1, as proposed by Haspelmath (1997). In this semantic map, Haspelmath distinguishes nine points of comparison, and the lines connecting these points indicate the relations between them (as established by the cross-linguistic variability). More precisely, when two points not connected by a line are both coded by the same pronoun in a particular language, then this semantic map predicts that the points on at least one of the possible connections between these two points will also be coded by that same pronoun.

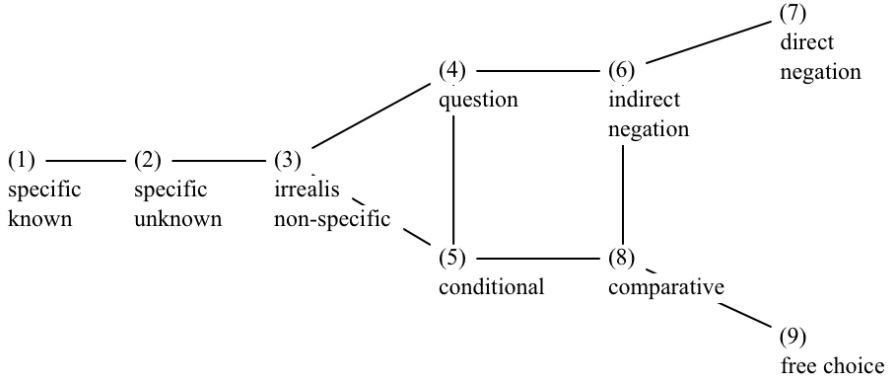


Figure 1. Semantic map of indefinite pronouns (redrawn from Haspelmath 1997)

In his survey of the methodology for building such semantic maps, Haspelmath (2003: 214) uses the term *function* to refer to the points of comparison. I would like to remain somewhat more agnostic about what kind of entities the bases for a semantic map are, and use the term *analytical primitive* instead. An analytical primitive is any concept that is needed for the analysis of a particular set of data. The choice of such primitives is of course informed by the researcher's hypotheses about the structure of human cognition and the social structure of linguistic interaction. However, primitives are primarily meant to be minimal elements of attested linguistic variation. Additionally, I would like to refrain from any claims about them being "universal" primitives of language structure. A particular primitive is used for the analysis of a particular set of data at hand, hence the addition "analytical" primitive (an addition that is often dropped for reasons of readability in this chapter). It might be the case that such an analytical primitive will withstand refinement by the further development of the field, and thus at one point be considered more than just an analytical tool. However, it is important to keep in mind that we currently only have a rather limited knowledge of the possibilities of human language structure and many of the received opinions about the extent of possible variation will probably have to be revised in the light of yet unknown diversity.

Analytical primitives minimally have to be cross-linguistically interpretable entities. They are the basic elements for cross-linguistic comparison. In contrast, the term *category* will be used here to refer to language-specific elements of linguistic structure. To preclude possible misunderstanding, I will sometimes use the term *language-specific category*, but in general I consider every category to be language specific and simply use the term "category" instead. In the process of typological comparison, the set of analytical primitives is used to describe the meanings or functions of the language-specific categories. For the building of a semantic map, a language specific category is equated to a particular selection of analytical primitives. Often, two different languages apparently have the same category, in the sense that the two categories are described by the same set of analytical primitives. Indeed, on that level of detail, both categories can be considered to be identical, though I expect that by adding more analytical primitives, further differentiation will occur. Cross-linguistic identity is always just a matter of the granularity of analysis.

A semantic map, then, is a structure, based on a set of analytical primitives, that models the variety of categories attested among the world's languages. I would like to stress the usage of the word "model" in this context.

I prefer not to interpret a semantic map as a "theory" of linguistic structure. A semantic map is a model of attested variation, which might, if it turns out to be a good model after many more years of research have passed, be the basis for the formulation of a theory. However, in my opinion we are still far away from any such secure models for them to be called theories. Two subsidiary notions arise when thinking about a semantic map in terms of a model. First, a model depends on the phenomena that one would like to emulate, so there could be different semantic maps for the same set of analytical primitives. A semantic map models attested relations between the various analytical primitives, and thus different results will arise depending on what kind of relations are considered. Second, the accuracy of a model is a factor that can be quantified. In other words, a semantic map should be compared to the data to be modelled, and a measurement should be established how well the model captures the data. In this sense, a semantic map is not just right or wrong anymore, but can be accurate to a certain extent.

Summarizing, three things are needed to make a model of the linguistic variation in the form of a semantic map. First, a set of analytical primitives is needed as the basis for cross-linguistic comparison. Second, a set of empirical relations is needed between every pair of primitives. Traditionally, this relation has been either "attested as combined into the meaning of a language-particular category" or "unattested as such". However, I will argue in this chapter that such "yes or no" relations might better be replaced by quantitative notions. Finally, equipped with a set of analytical primitives and a set of relations between them, it would be good to have a technique to display any structure in these relations. Note that such a method of display is not necessary to model the variation attested. The analytical primitives and the relations between them already are a model. However, linguists, being just human beings, normally cannot interpret any large table of numbers in a consistent and meaningful way. A good graphical display often tells much more than a thousand numbers. Yet, it is essential to realise that a graphical display is maximally as good as the underlying numbers. In most cases, the graphical display is just a coarse summary of the data, expelling much of the available variation (overgeneralizing) or suggesting much more than is actually attested (undergeneralizing). Ideally, every graphical display should be accompanied by some measures of accuracy to give an indication of the amount of distortion of the display relative to the data.

In this chapter I will discuss various options for the establishment of a semantic map for person marking. Depending on the choice of analytical

primitives, on the rationale of establishing relations between the primitives, and on the choice of the graphical display, different maps can be constructed. The choice between the various maps is not one between right and wrong, but one between suitable or unsuitable for a particular goal. Further, it is essential to always explicate the underlying assumptions that have been made for a particular semantic map, so that any conclusions drawn from a graphical display are really warranted by the empirical data. Beautiful pictures very easily tell stunning stories to human eyes, but these stories are not necessarily substantiated by the data underlying the graphical display.

3. A semantic map for person marking

3.1. Person marking primitives

Based on a large diversity sample of person paradigms (both in the form of independent pronouns and inflectional person marking), I have argued that at least eight primitives are needed to analyse the world's linguistic diversity of person marking (Cysouw 2003: 72–78).[2] These primitives are summarized in Table 1.[3] The numbers used in the first column of this table are abbreviated names for the primitives – they are not a feature-like analysis of their meaning (though the names are intended to have some mnemonic potential). Each person category in a particular language will be analysed as a combination of these primitives. A particular person category might consist of just a single primitive, like the English pronoun *I*, which is analysed as primitive "1" only. However, more often than not, a person category will be analysed as a combination of various primitives.

Table 1. Person marking primitives

Primitive	English	Referential meaning
1	*I*	speaker
2	*you*	addressee
3	*he/she/it*	other (i.e., neither speaker nor addressee)
12	*we*	speaker and addressee only ("dual inclusive")
123	*we*	including speaker and addressee ("plural inclusive")
13	*we*	including speaker but excluding addressee ("exclusive")
23	*you*	including addressee but excluding speaker
33	*they*	excluding speaker and addressee

For example, the English pronoun *we* is a combination of the primitives 12, 123, and 13. In the present chapter, such combinations of primitives are

written using slashes. Thus, the English pronoun *we* is analysed as 12/123/13. All such combinations of primitives as attested in the sample are summarized in Appendix A.

There is by now a long tradition in linguistics to further analyse such person primitives into combinations of person features. Such approaches are inspired by phonological theory, where phonemes are further analysed as bundles of phonological features. There is a wealth of different approaches in phonology to such feature-based analyses, and likewise (often as a direct spin-off) a multitude of them in the realm of person marking (cf. Cysouw 2003: 73, n. 7 and 8 for a quick survey). Most of such feature analyses of person marking are variations on a basic theme using independent features, like [speaker], [addressee], or [plural]. However, any justification for such a feature-based analysis must lie in the observation of morphosyntactic arguments for the presence or absence of each of the features. Most importantly, the set of primitives defined by the presence of a specific combination of features should form a natural class. For example, a feature [speaker] divides the person primitives into two different classes: those containing the speaker {1, 12, 123, 13} vs. those not containing the speaker {2, 3, 23, 33}. A possible argument for such classes could be, for example, the existence of categories 1/12/123/13 and 2/3/23/33, most famously attested in the independent pronouns of Qawasqar, an Alcalufan language from southern Chile (Clairis 1985: 463–464). As these categories are indeed attested as language specific person categories (although not very widespread), there is some evidence for a feature [speaker]. A suitable set of features for the analysis of person marking should be able to model all person categories attested (cf. Appendix A). As far as I can see, none of the feature analyses proposed even comes close to model the wealth of person categories attested. However, a detailed critique of feature-based analyses has to be the subject of another paper. In this chapter I will not use such features, but employ the eight analytical primitives as summarized in Table 1 as the basis for the analysis of person marking.

3.2. A traditional semantic map

On the basis of the eight analytical primitives, it is possible to make a semantic map along the lines summarized in Haspelmath (2003). The basis for such a map is a set of person categories which combine more than one

of these primitives into their referential meaning. The person categories that were attested in Cysouw (2003) are summarized in Appendix A.

To make a semantic map, the first categories to look for are person categories formed by combining exactly two primitives. With eight analytical primitives, there are 28 possible combinations of two primitives. Of these theoretical possibilities, fifteen are attested in the sample.[4] These fifteen combinations linking two primitives are minimally needed for a semantic map. They construct a semantic map as shown in Figure 2a.[5] The next step is to control which of the other categories attested are already accounted for by this map. Each category has to be a connected subgraph, meaning that the primitives involved have to be connected by lines. For example, the hypothetical categories 1/2/23/33 and 1/23/33 both are a connected subgraph of Figure 2a, but 1/2/33 is not. Going through the list of categories attested (see Appendix A), five of them turn out not to be accounted for by Figure 2a. These are 2/12/123/13 (5 cases), 2/12/123/23 (4 cases), 12/123/23 (2 cases), 3/12/123/33 (1 case), and 12/123/33 (1 case).[6] Some lines have to be added to account for these attested categories. There are various equivalent possibilities to add connections to account for these person categories. For example, the category 12/123/23 can be accounted for by either adding the connection 12–23 or 123–23. In this situation, Haspelmath (2003) does not present a principled way to decide between these alternatives.[7] The intuition of the researcher evaluating the resulting graph has to decide. For example, I might propose to add the connections 2–12, 123–23, and 123–33 as shown in Figure 2b, based on reasons of visual symmetry.[8] This is a semantic map for person marking that fits the data in Cysouw (2003).

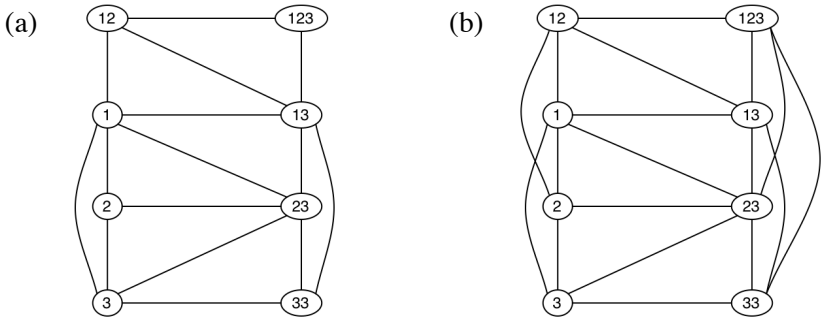


Figure 2. Semantic maps of person marking

3.3. Including frequencies

There are two problems with such semantic maps. First, the boundary between attested and unattested is given very high prominence, or, put more generally, the differences in frequency of attestation are ignored. Second, there are many connected subgraphs that are predicted by a semantic map, but that are not attested in the data. In most slightly more complex maps, the ratio of predicted to attested categories quickly becomes much too large to count as a good model.

Starting with the first problem, the semantic map of person marking shown in Figure 2b indeed accounts for all categories attested. However, it is questionable whether the missing lines in the map are really unattested in human languages, or only accidentally not found in the languages examined in Cysouw (2003). Specifically searching for such cases not yet accounted for, it did not take much time to come up with various "counter" examples. For example, in Estonian, verbs in the past have the same form for the second singular and the third plural, so this is a 2/33 category not yet accounted for by the semantic map (Erelt, Erelt, and Ross 2000: 226). In Daga (Dagan), the past forms of the class A verbs do not distinguish between the first singular and the third plural (Murane 1974: 52–54), so this is a 1/33 category also not accounted for by the semantic map. Finally, in the Diola-Fogny (Niger-Congo, Northern Atlantic) "short version" of the person prefixes, there is no distinction between the third singular and the exclusive (Sapir 1965: 90). This is a 3/13 category also not accounted for by the semantic map. Even after these links are added, there are still a few combinations not attested. However, I do not see any principled reason why these combinations should be absent from the world's linguistic diversity.[9]

The central point is that there does not appear to be a crucial difference between categories that are unattested, and categories that are only attested in very few languages. The difference between these two situations most likely reflects incidental effects of the language investigated, and not any preference of human language structure. In a different sample, it is very probable that other rare categories might be found. Still, this rather superficial difference between attested and unattested is crucial for the establishment of semantic maps in the tradition as summarized by Haspelmath (2003). In contrast, the fact that some person categories are extremely widespread, while others are exceedingly rare is not of importance for the building of a semantic map. Each exemplar, however common or rare it might be, is deemed equally important. Yet, the distinction between com-

mon and rare types is in most cases extremely robust, and to a large extent independent of the details of the sample used. Common types will normally be found widespread in whatever sample is used. This difference between common and rare categories seems to be a much more important fact to be modelled than the difference between rare and non-existing categories.

A straightforward solution for this problem is to draw lines in a semantic map with a thickness proportional to its frequency of occurrence.[10] In Appendix B, the frequencies for every pair of primitives are given. In most cases, such a frequency is the sum of occurrences of more than one category. For example, the primitives 1 and 2 have eight co-occurrences. This number is the sum of the frequencies of the four categories that include both the primitives 1 and 2, namely the categories 1/2 (3 cases), 1/2/3 (3 cases), 1/2/12/123/13/23 (1 case), and 1/2/12/123/13/23/33 (1 case). A semantic map using the frequencies from Appendix B to determine the thickness of the lines is shown in Figure 3. This picture gives an informative view on the relative importance of the possible connections between the primitives. However, already with the eight primitives in this example, the semantic map becomes rather messy. When more primitives are added, a display will only become less appealing and more difficult to interpret.

The second problem with the traditional semantic map is that there are many categories that are predicted by this model, but not attested in the current data. For example, the semantic map in Figure 2b predicts the existence of a category linking the primitives 1/2/3/12, though this category is currently unattested. This is not necessarily a bad thing, as a good model always predicts a few things not yet encountered. Such predictions can guide future research. However, the number of predictions should not be exceedingly large in relation to the explained data. As models are in general only approximations of reality, they will always show some excess (catego-

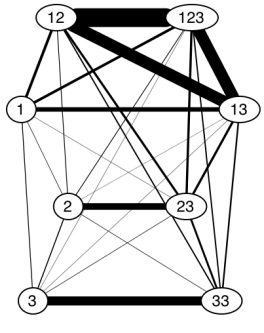


Figure 3. Semantic map of person marking informed by frequency of attestation

ries predicted that are unattested) and some deficiencies (categories attested, yet not covered by the model). I will here use the term "coverage" for the number of attested categories captured by the model divided by all attested categories, i.e., a coverage of 100% means that all categories attested are included in the predictions of the model. Additionally, I will use the term "accuracy" to refer to the fraction of attested categories among all categories that are predicted by the model, i.e., a 100% accurate model only predicts those categories that are attested.

In building semantic maps one will have to find a balance between coverage and accuracy. The tradition of building semantic maps in linguistic typology prefers high coverage to high accuracy. For example, Haspelmath's (1997) semantic map for indefinite pronouns (cf. Figure 1) has a coverage of 100%, but it actually predicts the existence of 105 different categories of which only 39 are attested, i.e., an accuracy of only 35% (cf. Cysouw 2001b). Looking at it this way, Haspelmath's model is rather inappropriate. To investigate the balance between coverage and accuracy, one should ideally investigate a large number of semantic maps, and look for cases that strike a good balance between the two.[11]

For the current case study of person marking, I investigated a few semantic maps that maximize coverage relative to the number of lines (see Appendix C). The balance between coverage and accuracy for these semantic maps is shown in Figure 4. For coverage, I counted the number of categories accounted for by the semantic map, and divided this by the total number of categories attested in the sample. For these calculations, I counted category tokens, i.e., I took the frequency of occurrence of each category into account. For accuracy, I counted the number of categories accounted for by the model, and divided this by the number of categories predicted by the model. Here I counted category types, i.e., I did not take the frequency of occurrence into account. The reason is that I do not have any ground for assessing the frequency of unattested types. The points in Figure 4 represent different semantic maps, with an increasing number of lines (going from left to right in the figure).[12] The first few lines that are added raise the coverage without leading to any inaccuracy. However, starting with the fifth line, some categories are predicted that are not attested. Subsequent lines that are added still improve the coverage, but the accuracy rapidly declines. Two different maps in this range are presented in Figure 5. In Figure 5a the map with five lines is shown with a reasonable high coverage (93.1%) and only very few unattested predictions (accuracy of 93.8%; there is actually only one unattested prediction, viz. 1/123/13). This can be

interpreted as a fine, though slightly conservative model. A map with a very high coverage (over 99%) is shown in Figure 5b, but this map predicts 120 categories of which only 34 are attested (accuracy of 28.3%).[13] This can be seen as a rather courageous model. A good model will be somewhere in the range between these two extremes.

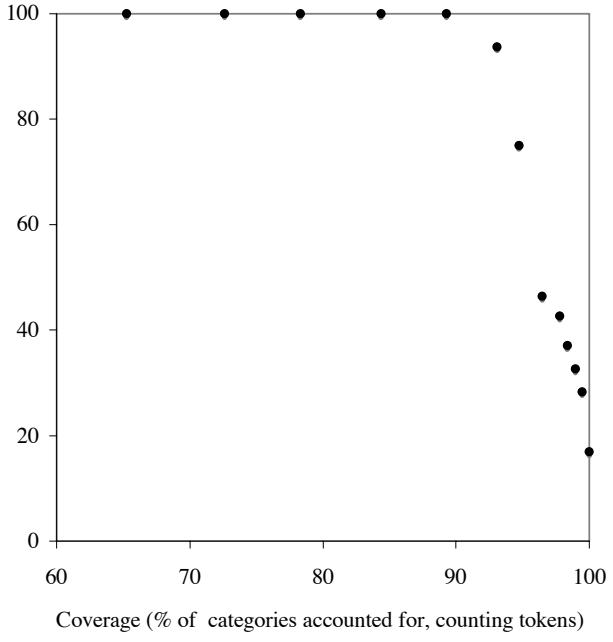


Figure 4. Searching for an optimum between coverage and accuracy

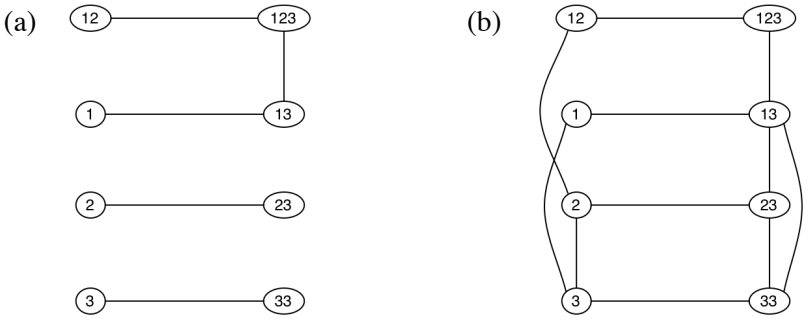


Figure 5. Semantic maps with a different balance between coverage and accuracy

3.4. Multidimensional scaling

A different approach to including the frequencies of attestation is to interpret the frequencies of co-occurrence (as summarized in Appendix B) as a measure of similarity. The higher the number of co-occurrences of two primitives, the more similar these two primitives are. The internal structure of such similarity-matrices can be displayed using multidimensional scaling (MDS). Glossing over the mathematical details, the idea behind MDS is that two objects that are similar are placed close to each other, and objects that are less similar are placed further away from each other. Intuitively, an MDS display, like the one shown in Figure 6 for the eight person primitives, can be interpreted like a Euclidean space, in which the distances between the primitives are indicative of their difference. The dimensions of an MDS display are nameless, and only indicate some general mathematical notion of similarity.

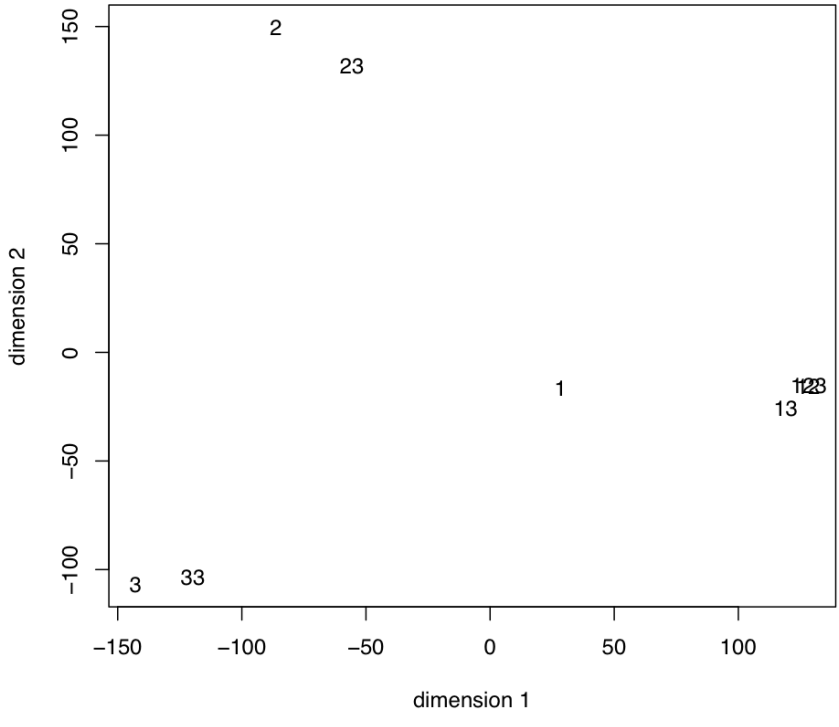


Figure 6. Multidimensional scaling of the person marking primitives

Although a display as shown in Figure 6 is extremely helpful when trying to make sense of a messy set of data, it is important to realize that MDS represents a strong reduction of the available information. I would therefore suggest not to consider MDS to be an improvement over the traditional semantic map (as proposed by Croft and Poole 2004). Without diving into the mathematical details of an MDS, let me explain this problem. When there are only three objects, with distances measured for every pair, then it is always possible to place these three objects on a two-dimensional plane in such a way that the pairwise distance between the points on the plane is exactly proportional to the measured distance (viz. three distances determine a triangle). However, with four objects this is not always possible. In most cases, a third dimension is needed to display the distances to the fourth object exactly. In principle, an extra dimension is needed for every object to be added. So for eight objects, as in the current case of person marking, seven dimensions would be needed. Now, the mathematical procedure called MDS tries to show as much as possible of the actual distances in only two dimensions. To do so, some of the distances have to be changed a bit. The MDS searches for the minimal amount of changes needed to display all objects in two dimensions. In a sense, this is comparable to removing some of the thinner lines from Figure 3. The selection of only two dimensions for an MDS is necessarily a reduction of the actual variation, focusing on the oppositions with the highest frequency. Of course, it would be possible to display a three-dimensional MDS, but that would still omit the dimensions four to seven. A display like Figure 6 is very useful to get some insight into the major dimensions of variation in a particular dataset, but it does not suffice as a model for the cross-linguistic variation, because there is an arbitrary cut-off point of data-reduction as determined by the dimensionality of display.[14]

4. Up one level: Mapping categories

Whatever semantic map will be considered most suitable for the problem at hand, it remains to be remembered that a semantic map (only) serves one particular function, namely to model categories on the basis of a set of analytical primitives. The question how these different categories relate to each other is not answered by establishing a semantic map. Investigating the relation between the categories themselves is in principle a straightforward extension of the methods discussed previously. It is possible to consider the

categories themselves as a kind of analytical primitives, and make a semantic map linking these categories to each other. Such an analysis can be considered a "second-order" semantic map. However, I would like to restrict the name semantic map for an analysis based on a set of (semantically based) analytical primitives. The higher order maps to be discussed in this section are analyses that take the categories themselves as a basis. Therefore, I would propose the name *category map* for such a display, showing the interrelation between language specific categories.

When making a category map, immediately the problem arises that there normally are very many different categories. In the present case of person marking, there are only eight analytical primitives, but 43 different categories. Searching for an optimal graph-structure is already problematic with eight primitives, the more so with 43, considering that the number of possible graphs rises exponentially with the number of primitives considered (see Note 11). For that reason, I will use multidimensional scaling here to investigate the relation between person categories. Remembering the provisos made in the previous section, the MDS displays to be discussed shortly are only attempts to find some structure in a large set of messy data. They are not intended to be models of cross-linguistic variation (let alone a theory).

Trying to relate the different language specific categories to each other, the question arises what kinds of relations to consider. More practically, the question is how to measure the similarity between two different language-specific categories. A straightforward approach is to take the relative overlap of primitives. For example, the categories 2/23 and 12/123/13/23 share one primitive (viz. 23) out of a maximally possible overlap of two primitives (viz. 2 and 23), giving a relative overlap of 0.5. This relative overlap can be computed for every pair of primitives. The MDS based on these distances is shown in Figure 7. The first dimension (depicted horizontally) distinguishes the categories including all the reference of English *we* (12/123/13) to the right from all categories not involving any kind of 'we' to the left, with all categories marking some kind of inclusive/exclusive distinction in the middle. The second dimension (depicted vertically) is somewhat more difficult to characterize, though it appears to separate categories including primitive 1 ('speaker') to the top from categories including primitive 33 ('third person plural') to the bottom, with everything else in between.

A more interesting measure of category similarity is based on the co-occurrence within paradigms. Person markers typically form a paradigm of

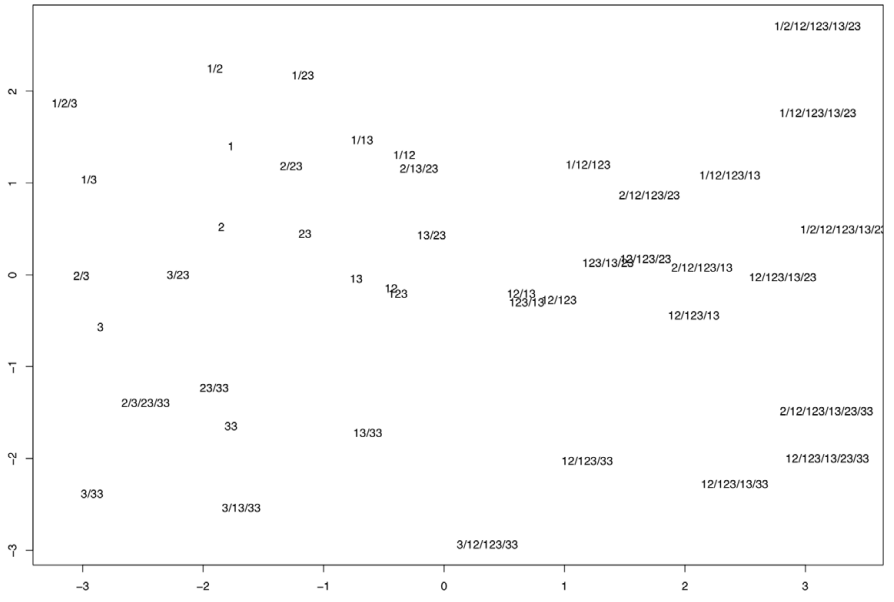


Figure 7. MDS of person categories. The underlying similarity between the categories is established by the relative number of shared primitives

syntagmatically related forms. Now, a straightforward measure of similarity between two categories is the number of paradigms that contain both categories. The idea underlying this measure is that if two categories regularly co-occur in a paradigm, this might indicate some connection between these categories. For example, in the present collection of paradigms, there are 72 paradigms in which both the categories 3/33 (i.e., number neutralization in the third person) and 2/23 (i.e., number neutralization in the second person) occur. The fact that this combination occurs so often seems to indicate that these two categories are linked (cf. there is might be a tendency to have number neutralization throughout various persons).

The frequencies of paradigmatic co-occurrence for every pair of categories is computed, and the MDS based on these frequencies is shown in Figure 8. This display shows some aspects of the paradigmatic structure of person marking (cf. the title of Cysouw 2003). The first dimension (depicted horizontally) distinguishes the categories consisting of only one of the eight analytical primitives to the left from the categories showing number indifferentiation to the right. The second dimension (depicted vertically) makes an interesting separation between the inclusive at the bottom (12/123), then a group of categories involving mixes of inclusive or exclu-

sive with other primitives in the middle, and a rather mixed group at the top. This mixed group contains both categories including all reference of English *we* (12/123/13) and categories mixing up person categories that are not including any 'we' (e.g., 1/3, 1/23, or 2/3/23/33). That these two kinds of categories belong together is also observed in Cysouw (2003) – though without such graphical display – under the name of *pure person* marking (Cysouw 2003: 163). Paradigms that "purely" mark person have at least some inclusive/exclusive distinction. Only when this distinction is not made in a person paradigm, then other person confusions might happen in a paradigm. This group of "non-pure" person markers is the one found at the top of the MDS in Figure 8. It is highly stimulating to find this regularity also in the mathematically established category map as shown in Figure 8.

These two category maps are only examples to illustrate the principle of extending the idea of semantic maps to higher structural levels. They are proposed as showing some new possibilities of mapping relations between

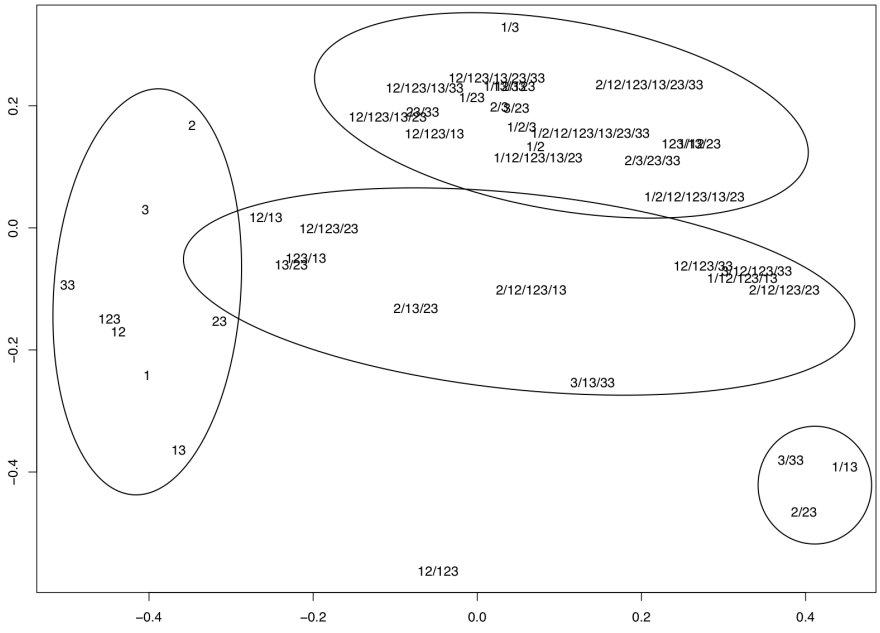


Figure 8. MDS of person categories. The similarity between the categories is established by counting the number of paradigmatic co-occurrences

linguistic structures, indicating directions for further research. Further possibilities can be found in the establishment of similarities and in the ele-

ments of comparison. First, there will surely be many more possibilities to establish similarities between categories (I have discussed only two possibilities here), often depending on the kind of categories investigated. Second, there are also other kinds of higher-level structural comparisons possible. For example, it seems a worthwhile project to establish a measure of similarity for the complete structure of paradigms, and establish a "paradigm map" showing the relation between paradigms (cf. Cysouw 2003: 245–294 for a non-mathematical attempt at establishing a paradigm map).

5. Conclusions

In this article, I have sketched a few possible directions that the analysis of semantic maps can take once larger amounts of data become available. The methods to investigate large sets of typological data are still in their infancy, and these proposals are meant to be a step towards slightly more sophisticated typological modelling of large datasets.

The main problem with the received approach to construct semantic maps is that it will probably not work when larger sets of data are considered. Using the approach to building semantic maps as succinctly summarized by Haspelmath (2003), it is very well possible that the resulting maps do not stand the test of additional data. The reason is that every new possibility attested has to be accounted for. Consequently, many rare phenomena, which will surely be found once more data is considered, will force correction of the semantic map. Because traditional semantic maps focus on possible human language structure, I would even predict that in the end most (if not all) of the possible lines linking two primitives will be needed to describe the wide variety of structural possibilities that the human language capacity can deal with. Much (if not everything) is possible in human language structure, though not everything is equally probable. It might be wise instead to focus more on modelling probable human language structure by taking into account the frequencies in which particular combinations are attested.

Interpreting a semantic map as a model for linguistic variation alleviates some of the pressure often put on a semantic map. The map does not have to be perfect. It should have a good coverage, but also a high accuracy. The received approach to semantic maps favours coverage above accuracy, because of the focus on possible language structure. When changing the view to model probable language structure, the option arises to search for a bal-

ance between coverage and accuracy. Both measures should be high, though neither has to be perfect.

Finally, it is important to realize that a model only helps us to understand the phenomena under consideration. A single model will never be able to capture all observations within a particular domain. Specifically for the domain of person marking, I have discussed how to investigate the cross-linguistic diversity of categories by making a semantic map of the eight person primitives (Section 3). Further, I have given some first hints as to the investigation of paradigm structure taking the 43 person categories as the primitives of a category map (Section 4). However, there are more levels of analysis possible. For example, it is possible to analyse the primitives by looking at even smaller elements like features (cf. the discussion in Section 2), and it is possible to investigate the relation between the structure of whole paradigms as attested among the world's languages. Combining all these possibilities, there are at least four different levels of analysis in which methods like the ones discussed in this chapter can be of service: features to analyse primitives; primitives to analyse categories; categories to analyse paradigms; and paradigms to analyse languages. Taking any one level as the starting point, it is possible to model the variation at the next level. However, I think it is a mistake to bypass levels and, for example, try to parameterize the variation among whole languages on the basis of a set of features. One should be taking one step at a time. Modelling is a modest business.

Appendices

Appendix A: Person categories

With eight analytical primitives, there are theoretically 2^8-1-1= 254 different person categories possible (minus one for taking none of the primitives, and minus one for taking all primitives; these combinations do not make sense as person categories). In total, there are 43 person categories attested. First, all eight primitives are attested individually as person categories. Further, there are in total 35 different combinations of the basic eight person primitives attested in the 325 person paradigms (from Cysouw 2003: Ch. 3 and 4). Only these 35 combinations of primitives are shown in this appendix, ordered by frequency. The most frequent combinations are easily interpretable referentially.

Categories	Approximate meaning	Freq.	Categories	Freq.
3/33	'third'	125	123/13	3
12/123/13	'first plural'	100	1/2	3
12/123	'inclusive'	97	1/2/3	3
2/23	'second'	84	12/13	2
1/12/123/13	'first'	35	13/23	2
1/13	'exclusive'	29	3/23	2
12/123/13/23	'non-third plural'	18	12/123/23	2
23/33	'non-first plural'	17	1/12/123/13/23	2
12/123/13/33	'non-second plural'	11	123/13/23	1
1/3	'non-second singular'	10	13/33	1
2/3	'non-first singular'	7	1/12	1
2/3/23/33	'non first'	6	1/23	1
3/13/33		5	12/123/33	1
2/12/123/13		5	1/12/123	1
12/123/13/23/33		5	3/12/123/33	1
2/13/23		4	1/2/12/123/13/23	1
2/12/123/23		4	2/12/123/13/23/33	1
			1/2/12/123/13/23/33	1

Appendix B. Frequencies of pairwise co-occurrence of person primitives

For every pair of primitives, the total number of categories was counted in which both primitives occurred.

	2	3	12	123	13	23	33
1	8	13	41	40	68	5	1
2		16	12	12	4	101	8
3			1	1	5	8	137
12				286	181	34	20
123					184	35	20
13						35	24
23							30

Appendix C. Evaluating different semantic maps as to coverage vs. accuracy

The first two columns describe a selection of semantic maps for person marking, adding lines subsequently. The third and fourth column described the coverage of these semantic maps, counting tokens. In total, there are 591 combinations of person primitives attested (i.e., the sum of the frequencies as listed in Appendix A). Further, there are 1109 occurrences of categories that only consist of one single primitive. In total, there are thus 1700 person categories in the present sample. The coverage is the number of categories accounted for divided by 1700. The last three columns describe the accuracy of the semantic maps. Out of the 254 possible cate-

gories only 43 are attested. The accuracy for the complete graph is thus 43/254 = 16.9%. Likewise, the accuracy is established for all other semantic maps considered.

No. of lines	Line added	Categories accounted for (tokens)	Coverage (%)	Categories accounted for (types)	Categories predicted (types)	Accuracy (%)
0		1109	65.2	8	8	100.0
1	3–33	1234	72.6	9	9	100.0
2	12–123	1331	78.3	10	10	100.0
3	13–123	1434	84.4	12	12	100.0
4	2–23	1518	89.3	13	13	100.0
5	1–13	1582	93.1	15	16	93.8
6	13–23	1610	94.7	21	28	75.0
7	23–33	1640	96.5	26	56	46.4
8	13–33	1662	97.8	29	68	42.6
9	1–3	1672	98.4	30	81	37.0
10	2–3	1682	98.9	32	98	32.7
11	2–12	1691	99.5	34	120	28.3
…	...	…	…	…	…	…
28	All lines	1700	100.0	43	254	16.9

Notes

1. I thank (in alphabetical order) Balthasar Bickel, Martin Haspelmath, Elena Maslova, Matti Miestamo, Nicoletta Puddu and Bernhard Wälchli for their helpful comments on earlier versions of this chapter.
2. Two further primitives of person marking that might be considered are "choric we" (i.e., a group of only speakers, speaking in unisono) and "present audience" (i.e., a group of addressees only, being addressed together). Although these are conceptually sensible primitives, there is currently no evidence known among the world's languages that such primitives are needed to analyse the person markers in the world's linguistic diversity (cf. Cysouw 2003: 72–78; Simon 2005).
3. These primitives include both singular and plural notions. One of the central claims of Cysouw (2003) is that the nominal notion "plural" has no place in the analysis of person marking (cf. Daniel 2005, who finds only 7% of the world's independent pronouns to be composed of a person stem with a nominal plural affix). In contrast, categories like dual, trial, or paucal are considered to be number categories in the realm of person marking. For reasons of space, these number categories are disregarded in this article.

4. The variability attested for person marking might seem large, and maybe other domains of linguistic structure are more constrained. However, there are not many domains of linguistic structure for which currently the possibility exists to perform an investigation with such a strong emphasis on diversity as I have been able to do for person marking. I have included every "odd" structure that I could find, thereby increasing the diversity to match the variability that would otherwise only be found in a much larger sample (impressionistically somewhere in between 1,000 and 2,000 languages). I expect that such extremely large samples will also lead to large variability in other domains of linguistic structure.
5. The layout of the primitives in this figure is inspired by the minimal/augmented person paradigm in which the dual inclusive (12) is aligned with the singular categories (cf. Cysouw 2003: 85–90). However, this aspect of the depiction is relatively unimportant, as for a semantic map only the graph structure of the connections counts.
6. None of these categories is particularly common among the world's languages. Also note that, except for the first, these categories are combinations of the inclusive (12/123) with either the second person plural (23) or third person plural (33). Even in larger samples of languages such categories are only rarely found. However, in an in-depth investigation of these quirks, Cysouw (2005) confirmed that their existence is a robust phenomenon.
7. Already in this rather simple case there is no principled way to decide between alternative connections in the semantic map, though there are many possible approaches to make this choice more constrained. Such procedures will become even more important in datasets that do not have as many pairwise connections between the primitives as are found in the present sample. A relatively straightforward approach would be to prefer connections that are needed for larger sets of cases in the data.
8. The argument of visual symmetry is of course completely dependent on the layout of the primitives. A different layout will invoke different pleasing visual effects. This argument should thus be taken only as exemplary for the many ad hoc arguments that might lead a researcher to propose a particular semantic map.
9. There is one consideration that I have not included here, and that is the argument of "incidental" categories. There is a recurrent argument to be found in the linguistic literature that some categories are to be considered incidents of history, and that such incidents do not have to be explained by a theory of linguistic structure. A commonly cited example of such an incident is a phonological merger leading to the synonymy of two erstwhile different categories. I consider it bad practice to disregard such cases in the collection of data, as the argument of incidentality might often be used to explain away examples that do not fit the theory to be proposed. Even when a merger can explicitly be shown to have taken place, this still raises the question why the resulting syn-

cretism is not immediately disambiguated. Concerning linguistic structure, the question is not what the origin of a structure is, but how likely it is that the resulting situation will occur. If a particular merger is indeed incidental, then there should be a low chance of occurrence of the resulting structure in a typological sample. Taking frequencies into account will thus implicitly delimit the influence of real incidental structures – without there being any need for a clear-cut decision on what should count as incidental, and what not.

10. It is a big problem exactly which frequencies should be deemed relevant to make a semantic map. As any set of empirically collected frequencies depend on the sample of languages chosen, so the whole issue of sampling in typology comes up at this question. The sample used in the present example of person marking can best be called a convenience-diversity sample, and might thus not be really applicable to an investigation of universal patterns in human language. However, the sample is still suitable to exemplify the possible usage of frequencies, whatever their meaning might be.
11. Ideally, all possible semantic maps should be investigated. However, this number will quickly get very high. For example, in the current case of person marking with eight primitives there are 28 possible lines. Each of these lines can be present or not in a semantic map, giving a total of $2^{28} \approx 2.7 \times 10^8$ possible semantic maps. Dealing with such large search spaces is difficult, though in computer science there are various kinds of sophisticated search algorithms available that could be used to approximate optimal solutions.
12. Only the addition of the first eleven lines is shown here. So, there are thirteen points in the figure: one for the model without any lines at all, one for the model with all 28 lines, and eleven points for the models in between, corresponding to the subsequential addition of one line.
13. Note that the map in Figure 5b could easily be given a visually much more pleasing layout without crossing lines. However, I have not changed the layout for reasons of comparability with the other maps discussed in this article.
14. The measure for the amount of data-reduction of an MDS is called the "stress" (normally given in percentages). The lower the stress, the better the display reflects the underlying distances. Figure 6 has a stress of 12%, which is actually not bad at all. For three dimensions, the stress even falls below 1%, so that is actually a rather good model for the case of person marking.

References

Clairis, Christos

1985 *El Qawasqar: Linguïstica Fueguina, Teoria y Descripción*. Valdivia: Universidad Austral de Chile.

Croft, William, and Keith T. Poole
2004 Inferring universals from grammatical variation: Multidimensional scaling for typological analysis. Unpublished manuscript. Available online at <http://www.unm.edu/~wcroft/WACpubs.html>.
Cysouw, Michael
2001a The paradigmatic structure of person marking. Ph.D. diss., Radboud University Nijmegen.
2001b Review of *Indefinite Pronouns* (Haspelmath 1997). *Journal of Linguistics* 37 (3): 99–114
2003 *The Paradigmatic Structure of Person Marking*. (Oxford Studies in Typology and Linguistic Theory). Oxford: Oxford University Press.
2005 Syncretisms involving clusivity. In *Clusivity: Typology and Case Studies of the Inclusive-Exclusive Distinction*, Elena Filimonova (ed.), 73–111. Amsterdam: Benjamins.
Daniel, Michael
2005 Plurality in independent personal pronouns. In *The World Atlas of Language Structures*, Martin Haspelmath, Matthew S. Dryer, David Gil, and Bernard Comrie (eds.), 146–149. Oxford: Oxford University Press.
Erelt, Mati, Tiiu Erelt, and Kristiina Ross
2000 *Eesti Keele Käsiraamat* [Handbook of Estonian Languge]. Tallin: Eesti Keele Sihtasutus. Available online at <http://www.eki.ee/books/ekkr/>.
Haspelmath, Martin
1997 *Indefinite Pronouns*. (Oxford Studies in Typology and Linguistic Theory). Oxford: Clarendon.
2003 The geometry of grammatical meaning: Semantic maps and cross-linguistic comparison. In *The New Psychology of Language: Cognitive and Functional Approaches to Language Structure*, Michael Tomasello (ed.), 211–242. Mahwah, NJ: Erlbaum.
Murane, Elizabeth
1974 *Daga Grammar: From Morpheme to Discourse*. (Summer Institute of Linguistics Publications in Linguistics 43). Oklahoma: Summer Institute of Linguistics.
Sapir, J. David
1965 *A Grammar of Diola Fogny: A Language Spoken in the Bass-Casamance Region of Senegal*. (West African Language Monograph Series 3). Cambridge: Cambridge University Press.
Simon, Horst
2005 Only you? Philological investigations into the alleged inclusive-exclusive distinction in the second-person plural. In *Clusivity: Typology and Case Studies of the Inclusive-Exclusive Distinction*, Elena Filimonova (ed.) 113–150. Amsterdam: Benjamins.

Typology and historical linguistics: Some remarks on reflexives in ancient IE languages

Nicoletta Puddu

1. Introduction

In this paper, I use both synchronic and diachronic typological generalizations as a starting point for the investigation of reflexives and intensifiers (according to König's 1998 definition) within the Indo-European (henceforth IE) family.[1] My analysis will then have a spin-off effect on the typological generalizations. In Section 2, after defining reflexive markers (2.1), I will sketch a typology of reflexives in ancient IE languages (2.2). On the basis of these data, I will suggest a hypothesis for the reconstruction of the original reflexive marker in Indo-European (2.3). In Section 3, I will deal with intensifiers (in many languages identical to reflexives) in Greek and Latin. I will show that these two languages show interesting typological features which lead to a reconsideration of some of the typological parameters.

A typological approach to Indo-European is not entirely new. The first work in which typology was programmatically used as a support to Indo-European reconstruction was Lehmann (1974).[2] Comrie (1993) clearly states the advantages and the disadvantages of studying Indo-European data in the light of typological generalizations. Linguistic typology can tell us whether there is any limitation to the combination of features, whether there are hierarchies regulating cross-linguistic variation in the relevant domains and whether some combinations are impossible or, at least, highly unlikely. Moreover, areal typology can be very useful for the identification of contact phenomena to be taken into account in the reconstruction of IE languages (see, for instance, Watkins 2001 on the Anatolian area). The first principle to follow, if typologists and historical linguists are to do joint work, is to share definitions, and this is not a trivial matter. As we will see, the case of reflexives is exemplary.

2. From typology to Indo-European…

2.1. Functional-typological studies of reflexivity

The problem of reflexivity has been widely studied under different theoretical approaches. Here I will use a functional-typological approach.[3] We can subdivide the problem into five main problems:

- The definition of a "reflexive marker" (henceforth RM) and of a "reflexive construction" (henceforth RC) (see Faltz 1985; Geniušienė 1987; Givón 1990, 1993).
- The relationship between RM and middle voice and the use of "heavy" and "light" reflexives (Kemmer 1993; Haspelmath 2003).
- The problem of "locally/non-locally bound reflexives" (Faltz 1985; Comrie 1999).
- The relationship between reflexives and intensifiers (König 1998, 2001; König and Siemund 1999, 2000; König and Gast 2006).
- The definition of universals of reflexive marking and their functional explanation (Haspelmath, forthcoming).

For obvious reasons of space, we cannot deal here with all these subproblems. Rather, we will focus on the definition of RM and on the relationship between reflexives and intensifiers, since they prove to be particularly interesting in our case.

I will use Faltz's (1985) definition of *primary reflexive strategy*, which is based on evidence from a sample of 30 languages:

> [G]iven any language, we can isolate a class of simple clauses expressing a two argument position, the argument being a human agent or experiencer on the one hand and a patient on the other … If that language has a grammatical device which specifically indicates that the agent/experiencer and the patient in such clauses are in fact the same referent, then the grammatical device will be called the primary reflexive strategy of that language (Faltz 1985: 3–4).

Faltz (1985: 28–66) identifies two reflexive strategies, one of which is further subdivided into three cases:

- A verbal strategy, as in Lakhota, where the affix *-ic'i-* can be prefixed to or infixed into the transitive verb stem.
- A nominal strategy, which can be implemented through the use of:

a) Reflexive pronouns, where a specific reflexive pronoun is used, as in German *sich*.
b) Head reflexives, where a noun is used as the head of a RM, as in Japanese *zibun*.
c) Adjunct reflexives, where a RM is added to a pronominal head, as in Irish *é féin*.

In this study, the form used as the primary reflexive strategy in a language will be defined as the *prototypical reflexive marker* (henceforth RM) of that language. For instance, English has a compound reflexive strategy and its prototypical reflexive marker is *x-self*.

Another difficult task is to define exactly the boundary between reflexive and middle. Kemmer (1993: 243) has extensively studied this problem. She defines the middle as characterized by:

– the identity between the source and the point of arrival of the process, and
– a low degree of elaboration of events.

Haspelmath (2003) gives the following representation of the polyfunctionality of RMs using a semantic map (see Figure 1).

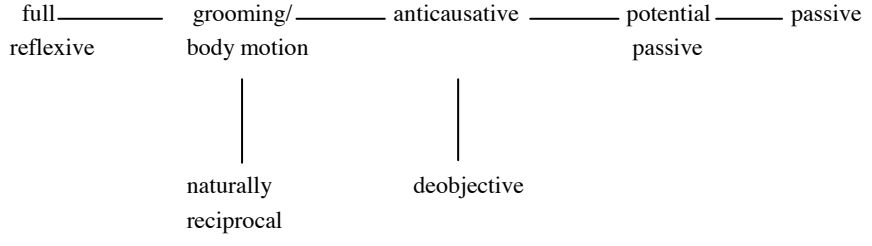


Figure 1. A semantic map for the reflexive marker (from Haspelmath 2003: 225)

The verbs of grooming (*wash*, *dress*, *shave* etc.) are typically performed by a person on himself/herself. Consequently, Faltz and Kemmer consider "grooming verbs" as "inherently" reflexive,[4] and indeed, in many languages, they do not need a RM. Consequently, constructions formed by a grooming verb and a RM are not considered to be prototypically reflexive constructions.

In this study, a given construction will be considered a primary reflexive structure if and only if specific syntactic and semantic conditions are fulfilled:

– The verb must be at least bivalent.
– The agent/experiencer and the patient must be coreferential.
– The verb must not be inherently reflexive.

Moreover, I will deal with some universals of reflexive marking. Here, I will quote only two of them formulated by Comrie (1999), since they are particularly relevant to our research (see Haspelmath, forthcoming, for further universals):

– If a language has distinct reflexive pronouns in the non-third person, then it will also have distinct reflexive pronouns in the third person (Comrie 1999: 337).
– If a language uses reflexives anywhere, it will use them in the most local domain (Comrie 1999: 342).

As for the distinction between local vs. non-local domain, I will use Comrie's (1999) definition repeated below:

> The range from local to extended is a scale, with the most local domain being, for instance, the argument of a single predicate, and progressively, more extended domains bringing in the adjuncts of the predicate, elements in other clauses, and finally (as discourse is considered) elements in other sentences (Comrie 1999: 338).

Given these definitions, the objective of this section is twofold: first, to define the primary reflexive strategy in attested ancient IE languages, and secondly, to reconstruct the original RM in Indo-European.

2.2. RMs in the ancient IE languages

No agreement has been reached on which was the original RM in Indo-European. One of the main problems is the absence of a cross-linguistically valid definition of reflexivity. Many scholars define the RMs simply as something which refers to the subject or to the topic,[5] but it is self-evident that such a definition is inadequate for a crosslinguistic study. A typologically based definition of reflexivity can be useful in the search for a solution to this problem.

On the basis of Faltz (1985), we can identify four different primary reflexive strategies used in IE languages: (a) head reflexives, (b) compound reflexives, (c) pronominal reflexives, (d) no reflexive construction.[6]

The eastern IE languages (Vedic, Old Avestan, Tocharian and Classical Armenian) use a head reflexive. The reflexive function in Vedic is carried by the noun for 'body', as in example (1).

(1) Vedic (RigVeda 3.1.1., from Kulikov, to appear)
agne *tanvàṃ* *juṣasva*
Agni:VOC.SG RM.ACC.SG enjoy:PRS.IMP.MD.2SG
'Agni, enjoy yourself'

As in the case of Vedic, the primary reflexive strategy of Old Avestan is the word for 'body' *tanū-*.

(2) Old Avestan (Yašt 17, 55, from Pinault 2001: 190)
āaṯ *azəm* *tanūm* *aguze*
then PRO.1SG.NOM RM.ACC hide:AOR.MD.1SG
'Then I hid myself'

Tocharian forms the direct reflexive employing the possessive adjective together with *āñcäm* 'soul', Tocharian A *ṣñi āñcäm*, Tocharian B *ṣañ āñcäm*.

(3) Tocharian A (K. T. Schmidt 1974: 310)
ṣñi *āñcäm* *sasrukāt*
POSS soul:ACC.SG kill:PST.MP.3SG
'He killed himself' (lit. 'He killed his own soul')

In Armenian, *ink'n* 'self' or the possessive adjective *iwr* together with *anjn* 'soul' are used as direct reflexives.

(4) Classical Armenian (Lk. 18: 14)
or *barjrac'owc'anē* *z-anjn* *iwr*
who humiliate:PRS.3SG NA-soul POSS.GEN
'Who humiliates himself' (lit. 'Who humiliates his own soul')

Another group of languages, i.e., the Celtic languages, Ingvaeonic and Hittite, does not have a specific reflexive construction. In Old Hittite, the so called reflexive particle *-za* is actually never used as a primary reflexive

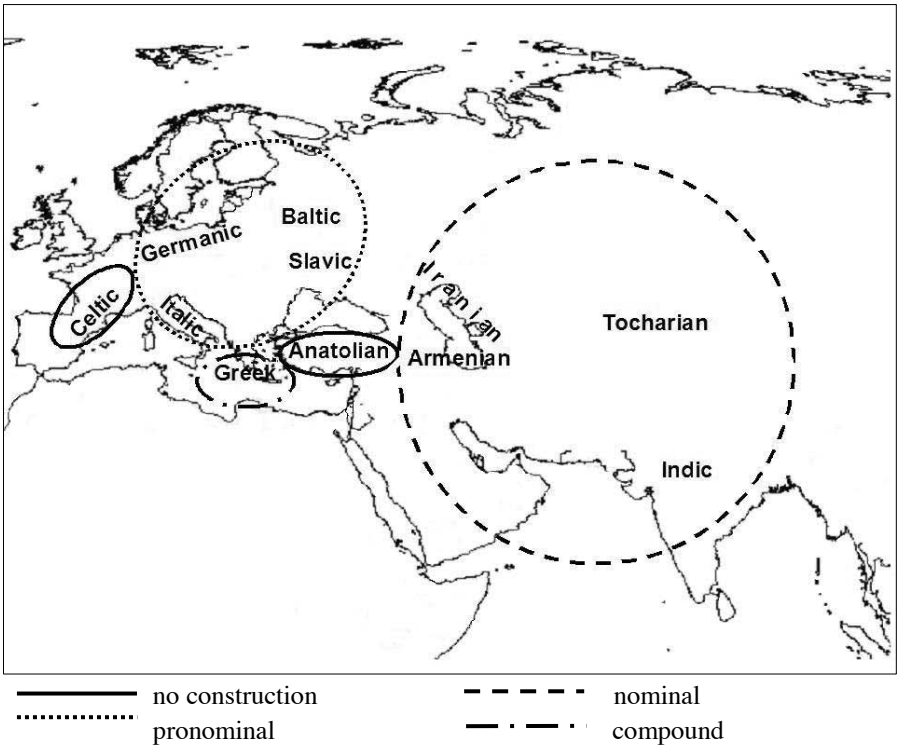
strategy and it acquires a reflexive function only in a later period. Celtic languages later created a reflexive strategy by adding the intensifier to the anaphoric pronoun (e.g., Irish *e féin*). Finally, the Ingvaeonic group seems to have lost the original Proto-Germanic reflexive pronoun **sik*. Later on, English recreated a reflexive strategy from *him/her* and the intensifier *self*, like Celtic languages (a possible areal phenomenon?). Frisian and Saxon acquired a new pronominal reflexive from the neighbouring Germanic languages.

As for Greek, the pronoun *hé* has often been considered a reflexive marker. However, I demonstrated in Puddu (2003, 2005) that it cannot be considered a primary reflexive strategy, since it never appears alone in object position. That is, it contradicts Comrie's (1999) principle quoted in Section 2.1. In Homeric Greek the primary reflexive strategy is *hè autón*, which is a compound reflexive, similar to English *himself* or to Irish *é féin* (see 5).

(5) Homeric Greek (Iliads 14, 162)
eltheîn eis Ídēn eû entúnasan
go:INF.AOR to Ida:ACC well array:PTC.AOR.ACC
hè autḗn
PRO.3SG INT.ACC.F.SG
'To go to Ida and array herself in rich attire'

Finally, a group of central languages (Old Italic, Germanic languages apart from Ingvaeonic, Slavic and Baltic languages) uses a pronominal strategy derived from the so called "reflexive stem" **se-/s(e)we-* (which will be discussed in more detail in Section 2.3.1).

Now, if we put these languages on a map (see Map 1 below),[7] we can see at first glance that we have two big areal clusters, a central-western one and an eastern one. This distribution cannot be due to chance and it confirms, as Watkins (2001) pointed out, the importance of areal studies within Indo-European. It seems however that it is not possible to reconstruct a common Indo-European primary reflexive strategy only on the basis of the data presented here.



Map 1. The primary reflexive strategy in the ancient IE languages

2.3. The Indo-European reflexive

2.3.1. Hypotheses on the original reflexive marker in Indo-European

We can summarize the three main hypotheses on the primary reflexive strategy in Indo-European as follows:

1) It was expressed by the middle voice.
2) It was expressed by the reflexive stem **se-/s(e)we-*.
3) There was no primary reflexive strategy.

The first hypothesis is strongly preferred by Lehmann (1974: 126), who, as we said, was the first to adopt a systematically typological approach in describing Indo-European. He argues that in VSO and SOV languages, reflexivity is marked by verbal affixes, while in SVO languages, it is ex-

pressed by pronominal forms. Consequently, supposing that Indo-European was originally SOV, he assigns the reflexive function to middle voice. Pronominal forms derived from **sew(e)-*,[8] in his opinion, assumed their reflexive value only when Indo-European gradually shifted from SOV to SVO. Watkins (1976: 309), criticizing Lehmann's hypotheses, pointed out that there are SOV languages, like Basque, which have a pronominal or even a nominal reflexive marker and, on the contrary, (VSO) languages, like Tagalog, where reflexivity is expressed by a nominal RM and not by a verbal affix.

Moreover, it seems that originally in Indo-European the middle voice had a lexical distribution and that it was a derivational category. Lazzeroni (1990), among others, claims that the grammaticalization of the middle, so that each verbal lexeme can manifest itself in the two diatheses, active and middle, is an innovation.

Watkins (1976) supports instead the idea that Indo-European had a reflexive pronoun based on **swe-*. The hypothesis that **se-/s(e)we-* was a reflexive is quite widespread in the literature. It can be found in works as early as Brugmann and Delbrück (1893). Generally, **se-* is reconstructed as a pronominal stem, commonly regarded as having a reflexive value (Shields 1998). However, Hahn (1963) has proposed that it was the original pronoun of the third person, which was only afterwards restricted to reflexive use and replaced in many languages by the demonstrative pronoun. G. Schmidt (1978) and Shields (1998) have proposed an etymological relationship between **se-* and the demonstrative stem **se-/o*, retained in Sanskrit *sás*, Greek *ho*, Gothic *sa*.

The original meaning of **s(e)we-* has given rise to even more discussion. Many scholars (e.g., Mezger 1948; Szemerényi 1964; and Erhart 1970) propose a nominal etymology on the basis of kinship names like **swesor* 'sister' and **swekuros* 'father-in-law', while Lehmann (1992) suggests that **s(e)we-* was an adjectival stem with the meaning of 'good, pleasant, dear'. Other scholars argue that **s(e)we-* is formed by **se-* and the particle **-we*, but, again, there is no agreement on its meaning. Petit (1999), mainly on the basis of Greek data, suggests that the opposition between **se-* and **swe-* was a distinction between an anaphoric pronoun and a reflexive pronoun (Petit 1999: 157–159).

In Puddu (2003, 2005), I argued that the stem **se-/s(e)we-* cannot be considered originally reflexive on the basis of the data in attested IE languages. The use of the derivatives of **se-* as anaphoric pronouns is well documented in Vedic, Avestan and Hittite forms. Notice that **se-* is the basis of reflexive pronouns in those IE languages which are more recently

attested (Italic languages, Gothic and Old Church Slavonic). In these languages, **s(e)we-* is always used for the possessive adjective. In addition, in Latin and in Old Prussian, **s(e)we-* gives rise to the genitive of the reflexive pronoun, which is also used as a possessive. Only Lithuanian and Latvian form the reflexive pronoun and the possessive adjective from **s(e)we-* but these are attested very late. To sum up, if we consider the derivatives of IE **se-/s(e)we-*, we see that **s(e)we-* gives rise to possessive adjectives, while only **se-* is used as an anaphoric.

Figure 2 clearly shows that in the oldest attested languages, **se-* had an anaphoric value; Figure 3 shows that the possessive meaning is earlier attested with respect to the reflexive one (dots indicate first attestation of language groups; ana = anaphoric, int = intensifier, poss = possessive, RM = reflexive marker, 0 = no trace of stem in pronominal declension).

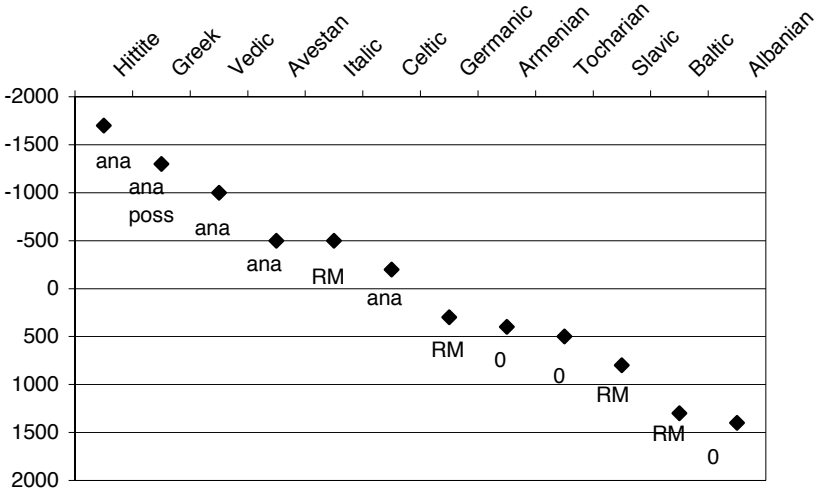


Figure 2. The outcomes of **se-* at first attestation in IE languages

But also in languages which use **se-* as a reflexive pronoun, we can argue that it is a later development. In Latin *se* can refer to the grammatical/logical subject of the clause in which it occurs (i.e., the so-called direct reflexive) or to the grammatical/logical subject of the matrix clause in reported speech or, more generally, in cases of subordination (i.e., the so-called indirect reflexive). In Classical Latin, but not in Archaic Latin, when *se* refers to the subject of the main clause, the dependent clause must be in the subjunctive.[9] According to Hahn (1963) *se* cannot then be considered a true reflexive, but rather, an anaphoric. She claims that in many IE lan-

guages the original personal pronoun of the third person came to be at least in part restricted to reflexive use and was replaced in other uses by the demonstrative. We can argue then that *se* was originally an anaphoric pronoun and that, as it restricts to reflexive use, it gradually loses the possibility to refer to elements outside the clause.

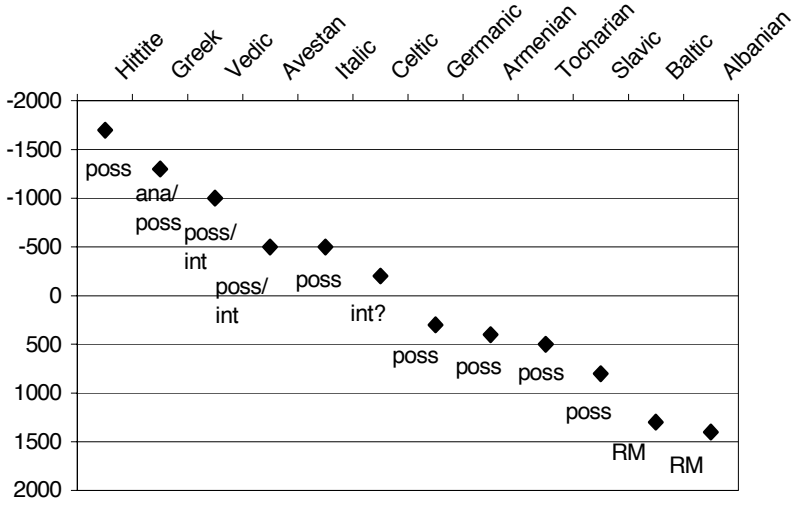


Figure 3. The outcomes of **s(e)we-*

As for *suus*, its original non reflexive value is particularly evident. Hahn (1963) supplies a series of meaningful examples where the possessive refers to the subject of a previous sentence. Look at example (6).

(6) Classical Latin (Plautus, Persa: 576, from Hahn 1963: 109)
hanc *vendidero* *pretio* *suo*
DEM.F.SG sell:FUT.PRF.1SG price:ABL.SG POSS.3SG.ABL.M.SG
'[I want that she is sold, if she can, if she cannot, I want to go away as soon as possible. …. Of course,] I will sell her at her own price'

Cennamo (1991) observes that the use of the pronoun *se* and the possessive adjective *suus* can be explained more satisfactorily if they are analysed from a pragmatic, rather than syntactic, point of view. *Se* and *suus* refer to the topic of the clause in which they occur (direct reflexive) and to the topic of discourse or macrotopic in subordination and coordination cases (indirect reflexive), independently of its syntactic realization.

2.3.2. Pronominal reflexives along Huang's (2000) hierarchy

From a typological point of view, it is possible to establish a hierarchy for the possibility of extra-phrasal reference. Huang (2000) proposed the following implicational universal for long distance reflexivization:

a) At the sentence level
   NPs > small clauses > infinitivals > subjunctives > indicatives
b) At the discourse level
   discourse > different turns in conversation
c) Sentence and discourse
   sentence > discourse

If a language allows the use of the RM for one of the complements, it will also admit all the complements higher in the hierarchy. Archaic Latin *se* is at the extreme right of the hierarchy, while Romance languages are at the extreme left. Indeed, in Romance languages *se* can be used only inside the clause.

Old Icelandic shows the same diachronic development as Latin. Indeed in Old Icelandic the RM *sig* could be used with reference to the subject of the main clause also when the dependent clause was in the infinitive as in example (7), from the *Morkinskinna* (13th century).

(7) Old Icelandic (Sigurðsson 1990: 313)

Hann	*... segir*	*... at*	*ber*
PRO.3SG.NOM	... say:PAST.3SG	... that	evident
svic	*við*	*sic*	*ero*	*orþin*
betrayal:NT.PL	against	RM	be:IND.3PL	become:PST.PTC

'He said that it had become evident that there was a betrayal against him'

In Modern Icelandic the RM *sig* can be used with reference to the subject of the main clause only if the dependent clause is in the subjunctive.

Gothic and Old Church Slavonic are at the left of the hierarchy. RM can refer to the subject of the main clause only if the dependent clause is infinitival or participial. Finally, according to Geniušienė (1987: 78), in Lithuanian a reflexive can refer to the subject of the main clause if the dependent clause is is infinitival or participial.

(8) Gothic (Mk. 3: 14)
jah gawaurhta twalif du wisan miþ sis
and appoint:PRET.IND.3SG twelve to be:INF.PRES with RM.DAT
'And he appointed twelve to be with him'

(9) Old Church Slavonic (Jh. 1: 29 [Marianus])
vidě Isusa grědošta kŭ sebě
see:PAST.3SG Jesus:ACC come:PTC.PRS.ACC towards RM.ACC
'He saw Jesus coming towards him'

(10) Lithuanian (Geniušienė 1987: 78)
Petr-as sakė-si serg-ąs
Peter-NOM say:PST.3SG-RM be_ill:PRS.ACT-PTC
'Peter says that he is ill'

We can then put all the IE languages into consideration along Huang's hierarchy in Figure 4.

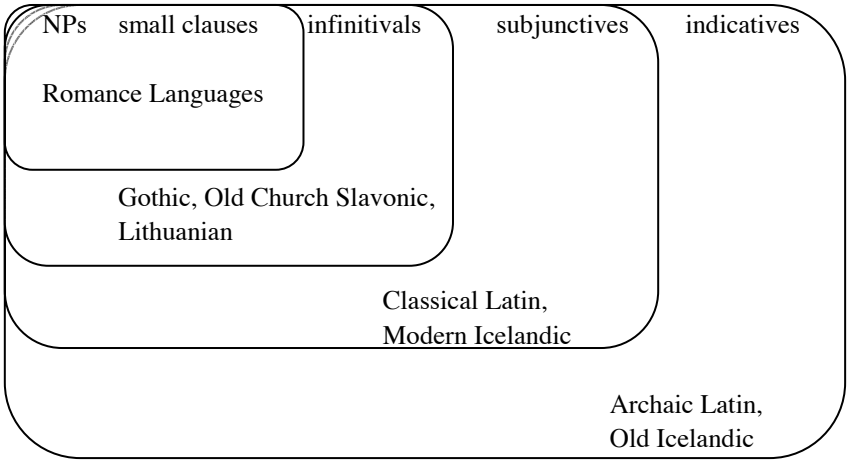


Figure 4. Position of IE languages with pronominal reflexives on Huang's (2000) hierarchy

All these data seem to suggest a diachronic process from an anaphoric use of *se* to the strictly reflexive use.

2.3.3. Conclusions

It is evident that, from a diachronic point of view, we can postulate a progressive reduction for the possibility of extraphrasal reference of the derivatives of Indo-European **se-*, rather than the contrary. From all our data we can conclude that **se-*, originally, simply marked coreference with a previously expressed element. At a certain point, the majority of IE languages tended to disambiguate the reference at the third person. We can then suppose that **se-* specialized in two directions. In some languages **se-* specialized initially to mark the topic (Latin) and then to mark true reflexivity. In other languages, like Vedic, it specialized in its anaphoric function.

To conclude, recalling Section 2.3.1, it seems that we can exclude hypothesis (2), i.e., that **se-/s(e)we-* was the primary reflexive strategy in Indo-European. As for hypothesis (1), the middle voice, as we said, seemed to originally have a lexical distribution; consequently it is unlikely that it carried the reflexive function. We could add a hypothesis (4), i.e., that the reflexive function was carried by a noun, as in the oldest attested IE languages. This hypothesis is even more unlikely than (1). Vedic and Avestan use the word *tanū-* 'body' which is not yet completely grammaticalized. This may point to an Indo-Iranian innovation. Tocharian has the word, 'soul' maybe under influence of Sanskrit *ātman-* 'soul', while Armenian has yet another lexeme.

Hypothesis (3) is then the most plausible one: Indo-European maybe had no dedicated primary reflexive strategy, just like Hittite and the Celtic languages. This statement cannot be definitely proven but, on the basis of our analysis, it seems to be highly probable.

3. …and back

As we said, the benefits of an integrated approach between Indo-European linguistics and typology are not unidirectional (i.e., towards Indo-European linguistics). In the case in point, the study of intensifiers in ancient IE languages has provided new data which has led to the adjustment of some typological generalizations.

Intensifiers, in many languages, are identical to reflexives. This is the case in English (see examples 11 and 12) but this is, nevertheless, a very widespread pattern.

(11) *I see myself in the mirror*

(12) *I washed my car myself*

On the other hand, some languages distinguish reflexives and intensifiers. This is the case in German (*sich* vs. *selbst*). In these languages which clearly distinguish between emphatics and reflexives, the two forms can combine to form the so-called "emphatic reflexive" (German *sich selbst*).

According to König and Gast (2006: 227), intensifiers "form a distributional class with a highly heterogeneous morpho-syntax". They can be identified crosslinguistically mainly on the basis of prosodic and semantic features. They are always stressed and they evoke alternatives to the referent of the head they are adjoined to. Crucially they structure the focused element and its alternatives in terms of centre and periphery.

Reflexives and intensifiers differ in their distribution: reflexives are used in argument positions (11) whereas intensifiers occur in adjunct positions to some noun phrase (12).

In Puddu (2005) I examined the prototypical intensifiers in attested ancient IE languages.[10] Here, I will deal with some features of Greek *autós* 'self, same', and Latin *ipse* 'self' since they are particularly interesting from a typological point of view.[11]

König (2001: 752) contends that languages which distinguish morphologically between intensifiers and reflexive pronouns do not use intensifiers in argument positions without an overtly expressed (pro)nominal head to which they attach. This generalization is stated as follows:

> In languages which draw a clear distinction between reflexive pronouns and intensifiers, intensifiers can be adjoined to both referential NPs and pronouns without any restriction, but they cannot occur in argument position without an accompanying focus (König 2001: 752).

On this point, however, the Greek and Latin data are quite problematic. Contrary to what is stated in the generalization, *autós* in Classical Greek does occur in argument positions without an overtly expressed head and is widely used as an anaphoric pronoun.

(13) Ancient Greek (Lysias, Orationes 4,5,3)

oukoûn	*êlthon*	*autòs*	*autòn*	*apoktenôn*
so	come:AOR.1SG	INT.NOM	PRO.3SG.ACC	kill:PTC.NOM

'So then I went myself to kill him'

Similarly, Classical Latin *ipse* occurs in argument positions, even if it is not an unmarked anaphoric pronoun like Greek *autós*.

(14) Classical Latin (Cicero, Familiares 10, 23, 6)
veniat *Caesar* *…,* *aut,* *si* *ipsum*
come:SBJV.3SG Caesar:NOM … or if INT.ACC
aliqua res *impedit,* *exercitus*
anything:NOM.F.SG prevent:PRS.IND.3SG army:NOM
mittatur
send:SBJV.PASS.3SG
'Let Caesar come…or, if any circumstance prevents him(self) from coming, let his army be sent'

König (2001: 752) does not consider the possibility that intensifiers and simple anaphoric pronouns might coincide, but only the case where intensifiers and reflexives are identical. We could consider Greek and Latin as exceptions to a strong version of the tendency proposed by König. It is, however, possible to slightly modify König's formulation in the following way:

> In languages which draw a clear distinction between reflexive pronouns and intensifiers, *and between anaphoric pronouns and intensifiers*, intensifiers can be adjoined to both referential NPs and pronouns without any restriction, but they cannot occur in argument position without an accompanying focus.

However, it is not surprising that König has not explicitly taken this possibility into account. The use of the intensifier as an anaphor is, as we said, somewhat peculiar from a typological point of view. If we follow Comrie (1999) in regarding the situation in which the arguments of a predicate are not coreferential as being prototypical, it seems counterintuitive that the intensifier is used as a non-coreferential pronoun. In other words *autós*, which as an adjunct often individuates the least expected participant, stands for the most likely expected participant in argument position. A possible explanation for the reasons why such a situation has developed can be found in Puddu (2005, forthcoming).

4. Conclusions

I hope to have shown that an integrated approach between Indo-European linguistics and typology is profitable for both fields. In the case discussed here, the use of a typologically based definition has helped us:

1) To classify primary reflexive strategies in attested IE languages. In Section 2.2 a picture of the situation was given: eastern IE languages use a nominal strategy, central-western languages use a pronominal strategy, Greek uses a compound strategy, while Hittite and the Celtic languages have no reflexive strategy in their oldest attestations.
2) To identify areal clusters and possible contact phenomena. The areal grouping shown on Map 1 cannot be the result of mere chance. However the hypothesis of areal contact should be investigated in more detail.
3) To support/refute hypotheses of historical development. From this analysis we can conclude that **se-*, originally simply marked the coreference with a previously expressed element. It is probable that there was no dedicated reflexive marker in Indo-European.
4) To provide a more complete definition of the parameters of variation of intensifiers by means of the analysis of Greek and Latin data.

The significance of this analysis is then twofold, since it leads to a better comprehension of ancient IE languages and, at the same time, provides a more precise definition of a crosslinguistically valid class. To conclude, the effort of combining a typological approach with a more "classical" historical approach is definitely worthwhile.

Notes

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present, PST past, PTC participle, RM reflexive marker, SBJV subjunctive, SG singular, VOC vocative.

2. But see already Jakobson (1957) on the possible contributions of typological studies to historical linguistics.
3. See Puddu (2005, Chapter 1) for a detailed review of the literature on different approaches to reflexives.
4. For an opposite view see Haspelmath (forthcoming).
5. See, e.g., Petit (2001), who defines the RM on the basis of Fruyt's (1987: 220) definition of the Latin RM *se*. According to his definition, the RM is something that refers not to the grammatical subject, but to the "agent of a process in a broad sense". Even if such a definition describes well the functions of Latin *se*, it cannot be a cross-linguistic valid definition of RM.
6. For every Indo-European group the oldest attested language was taken into consideration (e.g., Vedic for Indian) unless it was too fragmentary (i.e., I chose Homeric Greek instead of Mycenean Greek).
7. The map is supposed to represent the relative position of the IE languages at the beginning of the first millennium BC (see Watkins, 2001: 47).
8. I will use the reconstructed form **s(e)we-*, unless the scholar I am quoting proposed another reconstruction.
9. However, as Cennamo (1991: 5–6) notes, we can find the "indirect" use of *se* with reference to the subject of the main clause also in dependent clauses in the indicative in the Classical Era as well.
10. König (2001: 747) defines the prototypical intensifier as "the member of the lexical field [of intensifiers] which is less restricted in terms of syntactic distribution and semantic selection and may thus be regarded as the core member of this class".
11. See Puddu (forthcoming) and Puddu (2005, Chapter 7) for a more detailed analysis.

References

Brugmann, Karl, and Berthold Delbrück
1893 *Grundriss der vergleichenden Grammatik der indogermanischen Sprachen*. Strassburg: Karl J. Tubner.

Cennamo, Michela
1991 *Se, sibi, suus* nelle *Inscriptiones Latinae Chrisianae Veteres* ed i successivi sviluppi romanzi. *Medioevo Romanzo* 16: 3–20.

Comrie, Bernard
1993 Typology and reconstruction. In *Historical Linguistics: Problems and Perspectives*, Charles Jones (ed.), 74–97. London/New York: Longman.

1999 Reference-tracking, description and explanation. In *Sprachtypologie und Universalienforschung* 52: 335–346.

Erhart, Adolf
1970 *Studien zur indoeuropäischen Morphologie*. Brno: Universita J. E. Purkyně.

Faltz, Leonard M.
1985 *Reflexivization: A Study in Universal Syntax*. New York: Garland.

Fruyt, Michelle
1987 Interpretation sémantico-référentielle du réfléchi latin. In *Glotta* 65 (3–4): 204–221.

Geniušienė, Emma
1987 *The Typology of Reflexives*. Berlin/New York: Mouton de Gruyter.

Givón, Talmy
1990 *Syntax. A Functional-Typological Introduction*. Amsterdam/Philadelphia: Benjamins.
1993 *English Grammar: A Function-Based Introduction*. Volumes 1 and 2. Amsterdam/Philadelphia: Benjamins.

Hahn, Adelaide E.
1963 The supposed reflexive pronoun in Latin. In *Transactions and Proceedings of the American Philological Association* 44: 86–112.

Haspelmath, Martin
2003 The geometry of grammatical meaning: Semantic maps and cross-linguistic comparison. In *The New Psychology of Language. Cognitive and Functional Approaches to Language Structure*, vol. 2, Michael Tomasello (ed.), 211–242. Mahwah/London: Lawrence Erlbaum Associates.
forthc. A frequentist explanation of some universals of reflexive marking. Ms.

Huang, Yan
2000 *Anaphora. A Cross-linguistic Approach*. Oxford: Oxford University Press.

Jakobson, Roman
1957 What can typological studies contribute to historical comparative linguistics. In *Proceedings of the Eighth International Congress of Linguists*, Eva Siversten (ed.), 17–35. Oslo: Oslo University Press.

Kemmer, Suzanne
1993 *The Middle Voice: A Typological and Diachronic Study*. Amsterdam/Philadelphia: Benjamins.

König, Ekkehard
1998 Towards a Typology of Intensifiers. In *Proceedings of the XVIth International Congress of Linguists*, Bernard Caron (ed.), CD-ROM Amsterdam: Pergamon.

2001 Intensifiers and reflexive pronouns. In *Language Typology and Language Universals. An International Handbook*, Martin Haspelmath, Ekkehard König, Wulf Oesterreicher, Wolfgang Raible (eds.), 747–760. Berlin/New York: Mouton de Gruyter.

König, Ekkehard, and Volker Gast

2006 Focused assertion of identity: A typology of intensifiers. *Linguistic Typology* 10 (2): 223–276.

König, Ekkehard, and Peter Siemund

1999 Intensifiers as targets and sources of semantic change. In *Historical Semantics and Cognition*, Andreas Blank, Peter Koch (eds.), 237–258. Berlin/New York: Mouton de Gruyter.

2000 Intensifiers and reflexives, a typological perspective. In *Reflexives: Forms and Functions*, Zygmunt Frajzyngier and Traci Curl (eds.), 41–74. Amsterdam/Philadelphia: John Benjamins.

Kulikov, Leonid

to appear Typological notes on the Vedic reflexive. In *Proceedings of the International Conference "Reflexive and Middle, Tunis, 15–17 March, 2001*. Louvain: Peters.

Lazzeroni, Romano

1990 La diatesi come categoria linguistica, studio sul medio indoeuropeo. *Studi e saggi linguistici* 30: 1–22.

Lehmann, Winfred P.

1974 *Proto Indo-European Syntax*. Austin/London: University of Texas Press.

1992 From the middle to pronominal reflexive markers. In *Language and Civilization*, Claudia Blank (ed.), 139–146. Frankfurt: Peter Lang.

Mezger, Fritz

1948 IE se-, swe and derivatives. *Word*, 4: 98–105.

Petit, Daniel

1999 **sụe en grec ancien: la famille du pronom réfléchi. Linguistique grecque et comparaison indo-européenne*. Louvain: Peters.

2001 Linguistique comparative et variation typologique, le cas du réfléchi dans les langues indo-européennes. In *Indogermanische Forschungen* 106: 16–29.

Pinault, Georges-Jean

2001 Vedique *tanū́* et la notion de personne en Indo-Iranien. *Bulletin de la Société de Linguistique de Paris* 96 (1): 181–206.

Puddu, Nicoletta

2003 Reflecting on *se-/swe-: From typology to Indo-European and back. In *Proceedings of the XIV annual UCLA Indo-European Conference, 8–9 November 2002*, Karlene Jones-Bley, Martin E. Hudlin, Angela Della Volpe, and Miriam Robbins Dexter (eds.), 63–82. (The Journal

of Indo-European Studies, Monograph No. 47.) Washington: Institute for the Study of Man.

2005 *Riflessivi e intensificatori: greco, latino e le altre lingue indoeuropee*. Pisa: ETS.

forthc. *Autòs éphē, ipse dixit*, Intensifiers in Greek and Latin. Ms.

Schmidt, Gernot

1978 *Stammbildung und Flexion der indogermanischen Personalpronomina*. Wiesbaden: Otto Harrasowitz.

Schmidt, Klaus T.

1974 *Die Gebrauchsweisen des Mediums im Tocharischen*. Göttingen: Offsetdruck.

Shields, Kenneth

1998 On the Indo-European reflexive. *The Journal of Indo-European Studies*, 26 (1): 121–129.

Sigurðsson, Halldór Ármann

1990 Long-distance reflexive and moods in Icelandic. In *Syntax and Semantics 24: Modern Icelandic Syntax*, Joan Maling, Annie Zaenen (eds.), 309–346. London: Academic Press.

Szemerényi, Oswald

1964 *Syncope in Greek and Indo-European and the Nature of the IE Accent*. Napoli: Istituto Universitario Orientale di Napoli.

Watkins, Calvert

1976 Towards proto-Indo-European syntax, problems and pseudo-problems. In *Diachronic Syntax. Papers from the parasession of CLS*, Sanford B. Steever, Carol A. Walker, and Salikoko Mufwene (eds.), 305–326. Chicago: Chicago University Press.

2001 An Indo-European Linguistic Area and its Characteristics, Ancient Anatolia. Areal Diffusion as a Challenge to Comparative Method? In *Areal Diffusion and Genetic Inheritance. Problems in Comparative Linguistics*, Alexandra A. Aikhenvald, Robert M. W. Dixon, 44–63. Oxford: Oxford University Press.

Part V. Verbal and clausal categories

Discreteness and non-discreteness in the design of tense-aspect-mood

Gontzal Aldai

1. Introduction

In the present chapter,[1] I discuss a number of issues regarding discreteness and non-discreteness in tense-aspect-mood (henceforth TAM) systems.[2] My dissertation, Aldai (2002), examined the grammaticalization of the TAM system of Basque from a typological perspective, particularly, the grammaticalization of the Basque constructions competing for the domains of present and past. In that work, I tested several hypotheses on TAM grammaticalization against historical Basque data. Since the theory of grammaticalization, especially of TAM systems, has inspired a vast amount of literature in the last decades (cf. the seminal work by Bybee, Perkins and Pagliuca 1994), I will not discuss specific issues on grammaticalization in the present work.

The goal of this chapter is rather a more general one; namely, to try to make the passage from grammaticalization data to theoretical generalization regarding discreteness and non-discreteness of TAM. More specifically, I will discuss the questions whether one form may have more than one TAM meaning and, conversely, whether one TAM meaning may be expressed by more than one form. Certainly, in current linguistics, theoretical generalizations can hardly go without ascription to a specific framework (even if many practical postulates are in fact shared by scholars of all persuasions). The typological literature on the grammaticalization of TAM systems has mostly had a functional orientation. Thus, positioned within a typological-functional tradition, in the present chapter I first try to elucidate whether the historical Basque data on TAM provide evidence in favour of hypotheses proposed by functional frameworks or rather in favour of those from formalist frameworks. (The data, of course, can also be neutral regarding both positions, or can also contradict both of them.) I then discuss general questions related to the models that may be appropriate to account for the data.

The order of presentation of the chapter is as follows. In Section 2, I present the TAM framework I adopt. In Section 3, I introduce some methodological points I followed in Aldai (2002). I also present there the main constructions of past tense in Basque, together with a couple of examples expressing perfective meaning in historical Basque. Section 4 is devoted to discussing the question whether one TAM form may have more than one meaning. Section 5, conversely, examines the question of one TAM meaning expressed by more than one form. Section 6, finally, offers some concluding remarks.

2. Theoretical framework

The TAM framework adopted in Aldai (2002) and in the present work is the one that can be called the Comrie-Dahl-Bybee approach (cf. Comrie 1976, 1985; Dahl 1985; Bybee 1985; Bybee and Dahl 1989; Bybee, Perkins and Pagliuca 1994). Although there are differences in the works by these scholars, their similarities are more significant, especially when compared with structuralist and formalist approaches to tense-aspect-mood. Thus, we may say that the combination of the above contributions makes up the foundation of the modern typological study of TAM.

2.1. Pioneer work

Comrie's (1976, 1985) pioneer studies already presented many of the points that were elaborated in subsequent research. Above all, Comrie's work has a clear vocation for using data from as many languages and language families as possible. His approach is data-driven, and theoretical formalization is not essential. An important theoretical point that Comrie introduces in his book on aspect (1976: 10–11) and emphasizes in the one on tense (1985: 18–23) is the possibility for TAM forms to have a basic meaning and secondary meanings, where the basic meaning may be defined in terms of a prototype rather than in terms of necessary and sufficient conditions. This last point was later worked up and put into practice in Dahl's (1985) questionnaire (see Section 2.2). In fact, what subsequent methodologically more sophisticated studies have proved to be one of Comrie's major achievements, is his correct identification and definition of the major categories of aspect and tense.

Comrie's work was followed by other studies which tried to improve the methodology for TAM classification. Dahl's (1985) project was methodologically innovative in that it employed directly elicited data, instead of resorting to the common practice of using reference grammars for typological comparison. Additionally, he used a reasonably good coverage of the world's languages. Later work by Bybee and her associates used a language sample controlled for genetic and areal bias. Yet, as I will discuss below, the main accomplishment of Dahl's (1985), Bybee's (1985), and Bybee, Perkins and Pagliuca's (1994) methodology lied in their ability to identify cross-linguistic TAM categories empirically.

2.2. How to establish cross-linguistic categories of TAM

The first question one needs to address in order to carry out any study of tense-aspect-mood (either comparative or language-specific) is to determine the cross-linguistic (also called "universal") categories of TAM. This is no trivial matter.

As long as psycholinguistic studies do not provide us with new techniques for TAM categorization, and if we try to take as few introspective assumptions as possible, I think the best way to arrive at those cross-linguistic categories of TAM is by means of what we may call the typological method of categorization. The above-mentioned TAM project by Dahl (1985) is fairly representative of this type of methodology. Dahl first characterizes language-specific TAM constructions (categories) by establishing the occurrences of each construction in the sentence-examples of a questionnaire. Then, the way in which he identifies (major) cross-linguistic TAM categories is by quantitatively comparing the distribution of language-specific constructions. That is, only if one is "able to find a sufficiently large number of language-specific categories the distributions of which are [significantly] similar, it makes sense to start talking about a … cross-linguistic TAM category" (Dahl 1985: 54). The quantitative typological methodology, therefore, provides us with a valid strategy for empirically establishing the cross-linguistic categories of TAM.

It follows from the type of methodology employed in this kind of research that the cross-linguistic TAM categories arrived at will show up in terms of a focus and a periphery. That is, the result of Dahl's project is a list of cross-linguistically comparable TAM meanings (categories), each of which contains a number of occurrences ranked from the most prototypical or focal to the most peripheral. It is further assumed that each category is

best characterized by its prototypical occurrences, which correspond to those that appear most often across languages. But, following this methodology, not only the occurrences of a given category can be ranked (into focal vs. peripheral); TAM categories themselves can also be ranked into central and non-central.

Dahl proposes several criteria to establish the centrality of TAM meanings (categories). The most important criteria are: 1) type of marking, i.e., morphological vs. periphrastic; 2) obligatoriness vs. optionality of marking; and 3) frequency, both cross-linguistically and language-internally. Dahl's conclusion is "that the different criteria of centrality assign roughly the same order to the cross-linguistic categories we have postulated, with past, perfective and future as a clear central group" (1985: 188).

A theoretically relevant question is whether the cross-linguistic TAM meanings (categories) found by the typological method, and especially the most central categories, have any universal psychological reality. This is indeed a difficult issue. One is inclined to think that, if there is any level where TAM categories are at all universal (perhaps a level of "conceptual space", Dahl 1985: 34, external to grammars),[3] the cross-linguistic TAM categories found ought to be similar to those psycholinguistic universals.

The hypothesis that arises from this kind of research is that the basic units of a cross-linguistic ("universal") theory of TAM are given by the focal areas of TAM meanings, and especially the focal areas of central TAM meanings. A crucial piece of evidence in favour of this hypothesis is the fact that different authors using partly different methodologies arrived at very similar results; namely, TAM systems cross-linguistically tend to be organized around a small number of identifiable "universal" focal meanings, so that TAM constructions in any given language tend to cover these focal portions of the conceptual space. Thus, Bybee, Perkins and Pagliuca (1994: 15) argue that "the most general of grammatical meanings are very common cross-linguistically and very similar, even if they develop from different sources. That is, many languages have a general past, perfective, present, imperfective or future whose functions are very similar". They add further: "we replicate the findings of Dahl (1985), who showed that at least one of the two closely related [categories], past and perfective, occurs nearly universally" (1994: 15).

2.3. The theory of grammaticalization

I have just argued that languages tend to cover the focal portions of the conceptual space with grammatical TAM constructions. However, every language does not need to have explicit grammatical markers for all functions. Thus, in some languages, some or all of the focal TAM meanings may not have grammatical expression. In what follows I will only consider languages which do have grammatical(ized) TAM categories.

Now, if we accept that the basic units for cross-linguistic TAM comparison are given by the focal areas of the semantic domain, we seem to be excluding TAM structure from our approach. And yet, all modern linguistic approaches (including and indeed specially including formalist frameworks) demand to thoroughly examine the form, i.e., the structure or the "design", of grammatical TAM systems and constructions.

In truth, typological-functional approaches to TAM do take structure into account. However, the study of the structure of TAM constructions is in these frameworks partly independent of the synchronic study of their meaning. Rather, structure is mostly studied from a diachronic perspective. In other words, while formalist approaches advocate for a very direct, synchronic and abstract way of analysing this structure, typological-functional theories start from the most obvious facts; namely, the way actual TAM constructions have been grammaticalized (and partly fossilized) to convey a specific meaning. This is the reason why, for instance, Bybee and Dahl (1989) focus on studying "the creation of tense and aspect systems in the languages of the world".

Thus, from Bybee and Dahl (1989) onwards, the focus of the typological-functional research on TAM turned towards the theory of grammaticalization. Studies such as Bybee, Perkins and Pagliuca (1994) underline the importance of the relationship between form and meaning in TAM constructions. More specifically, there are a number of cross-linguistic correlations between TAM meanings and the formal way they are expressed. (Some of these correlations and the need to study the "formal expression" of aspectual constructions were already present in Comrie 1976.) The theory of grammaticalization tries to provide external explanations (based on metaphors, etc.) for the existence of such correlations. Basically, when new TAM constructions are created, for any given meaning that is grammaticalized, there are specific formal "sources of grammaticalization" which seem to be readily accessible for rendering such a TAM meaning. For instance, locative expressions (e.g., *be at working*) are very commonly used to convey progressive meaning, etc.

Metaphors and other kinds of semantic associations are not only responsible for the creation of new TAM constructions. Partly grammaticalized constructions can also undergo changes in their meaning due to similar semantic mechanisms. Thus, it is important not only to look at the source of grammaticalization of TAM constructions but also at their subsequent semantic evolution. Scholars working on grammaticalization have found that many of these semantic changes are unidirectional, due to the fact that the same mechanisms of change tend to recur across languages. These recurring changes starting from one given source of grammaticalization give rise to what are known as "clines" or "paths of grammaticalization".

For example, both the Present Perfect[4] (or just Perfect) and the Past Perfect (or Pluperfect) found in a number of well-studied Romance and Germanic languages may eventually evolve into perfectives. These constructions appear to constitute an areal phenomenon of Western Europe, because of particularities such as the use of the auxiliary 'to have'. Also, the most common evolution in Western Europe is for the Present Perfect to acquire perfective meaning. The Basque Perfect-Perfectives (see Section 3.1 and note 5) ought to be understood in this context. Yet, in Western Basque it is only the Past Perfect that has acquired perfective meaning (while in spoken Eastern Basque also the Present Perfect has evolved to a perfective). Thus, the best way of understanding these constructions, their similarities and their differences, is by looking at their source of grammaticalization and the subsequent language-specific changes. Their differences, then, are explained as the result of the evolution that the same source may have experienced in different languages (especially regarding different points of evolution along the same path of grammaticalization).

Concerning the hypothesis of unidirectionality of semantic change (cf. Bybee, Perkins and Pagliuca 1994: 12–13), we may say it has enough empirical evidence to be considered a very important factor in the study of TAM. Yet, if strictly considered, the hypothesis is quite a strong claim, and I would prefer to consider it as one factor among others in the evolution of TAM constructions.

3. Methodology

The data I collected for Aldai (2002) was extracted from written texts of Old Basque (16th–17th centuries.), Middle Basque (18th–19th centuries) and Modern Basque. The main sources of data were three parallel texts, spe-

cifically three versions of the New Testament written in the Labourdin dialect (Eastern Basque) in three different stages of the language. The oldest text was written in the 16th century (1571), the second in the 18th century (c. 1740), and the most recent text is a 20th century version.

The methodology I applied was the following. I collected around 5000 tokens of finite verbal forms for each stage of Basque examined, i.e., 16th, 18th and 20th centuries. I then assigned a TAM semantic label to each of the verb forms I collected, following the Comrie-Dahl-Bybee classification of TAM meanings. (As mentioned above, among these scholars there are only minor differences regarding the identification and characterization of cross-linguistic TAM constructions or "categories".) For short definitions, see Bybee, Perkins and Pagliuca's "meaning labels" (1994: 316–324). For prototypical examples, see the "prototypical occurrences" of each category throughout Dahl's (1985) work. (A list of "major TAM categories" is given in Dahl 1985: 183–184, and all the examples in his TAM questionnaire appear in Dahl 1985: 198–206; cf. also Aldai's 2002 glossary on TAM meanings.) Obviously, the criteria for determining which TAM meaning a given Basque form presents in each example collected are independent of the specific construction being used.

As an illustration, I will present a couple of Basque examples of perfective meaning from my database. To that end, I need to introduce the past-tense constructions of historical Basque, as well as to characterize perfective meaning by presenting its prototypical occurrences.

3.1. Past-tense constructions in historical Basque

The major forms conveying past-tense meaning at any stage of Basque considered are the following five constructions:

1. Synthetic Past (*zegien* 's/he did', *zuen* 's/he had'). This is a synthetic form which may show agreement with absolutive, ergative and/or dative arguments, and which is also marked for past tense by a suffix *-en*. (Cf. its present-tense counterpart, the Synthetic Present: *dagi, du*.)

2. Periphrastic Past Imperfective (*egiten zuen* 's/he used to do, s/he was doing'): This form is constructed by the combination of the Present Participle (*egiten* 'doing') plus a finite Synthetic Past form of the stative auxiliaries *izan* 'be' or *e(d)un* 'have'. (Cf. its present-tense counterpart, the Periphrastic Present *egiten du* 's/he does', with Synthetic Present stative auxiliaries.)

3. Present Perfect-Perfective[5] (*egin du* 's/he has done'): This construction is formed by the combination of the Past Participle (*egin* 'done') plus a conjugated Synthetic Present form of the stative auxiliaries *izan* 'be' or *edun* 'have'. In modern Western Basque, this construction can co-occur with hodiernal past-reference adverbials (*gaur goizean egin dut* 'I did it this morning'); in spoken modern Eastern Basque, in turn, it can also co-occur with pre-hodiernal past-reference adverbials (*atzo egin dut* 'I did it yesterday').

4. Past Perfect-Perfective (*egin zuen* 's/he did'): This construction is formally the past counterpart of the former; hence their parallel nomenclature. Thus, it is formed by the combination of the Past Participle (*egin* 'done') plus a finite Synthetic Past form of the stative auxiliaries. This construction co-occurs in both Western and Eastern Basque with pre-hodiernal past-reference adverbials (*atzo egin nuen* 'I did it yesterday').

5. Periphrastic Aorist (*egin zezan* 's/he did'): This construction was formed by the combination of the Verbal Radical (*egin* 'do', which in this specific case coincides with the Past Participle) plus a conjugated Synthetic Past form of the dynamic (telic) auxiliaries *-di-* 'become' or *-za-* 'get, achieve'. This construction expressed perfective meaning in Old Basque.

3.2. Dahl's prototypical occurrences of perfective meaning

According to Dahl's (1985: 78, 73) findings, the prototypical occurrences of perfective meaning can be sorted into the following groups: narrative discourse (Dahl's sentences 100 [2nd verb], 101 [2nd verb], 162, 165, 167, 172, 175), punctual or single past events (sentences 14, 91), and bounded past events (sentences 92, 99). To give just one example, Dahl's sentence (101) may serve as a prototypical perfective occurrence (example 1, Dahl 1985: 202):

(1) *[Last year, the boy's father sent him a sum of money.]*
When the boy GET *the money, he* BUY *a present for the girl.*

Note that it is only the second verb occurrence (BUY) that represents prototypical perfective. The first verb occurrence (GET) does appear among the possible uses of a perfective, but it does not reflect one of its prototypical instances. (Actually, the occurrence of the verb GET in example (1) seems to be closer to pluperfect meaning, although it is not a prototypical instance of pluperfect either; Dahl 1985: 145.)

3.3. Historical Basque examples of perfective meaning

The examples in (2) from the Gospel according to Matthew in my database (Mt 8: 5) show a Basque sentence that is parallel to Dahl's example given in (1) above:

(2) a. *Eta* *sar-thu* *zen-ean* *Jesus* *Capernaum-en,*
and enter-PTCP was-when Jesus Capernaum-LOC
ethor *zedin* *haren-gana* *zentener* *bat*
come 3.INTR.AUX 3-ALL centurion one
'And when Jesus entered Capernaum, a centurion came to him.'

b. *Jesus* *sar-thu* *zen-ean* *Capernaum-en,*
Jesus enter-PTCP was-when Capernaum-LOC
ehun *gizon-en* *kapitain* *bat* *ethorr-i* *zitzaioen*
hundred man-GEN.PL captain one come-PTCP was.to.3
'When Jesus entered Capernaum, a centurion came to him.'

c. *Jesus* *Capernaum* *herri-an* *sarthu* *zenean,*
Jesus Capernaum town-LOC enter-PTCP was-when
erromatar *ehuntari* *bat* *hurbil-du* *zitzaikon*
Roman centurion one come-PTCP was.to.3
'When Jesus entered the town of Capernaum, a Roman centurion came to him.'

Example (2a) is taken from the 16th century version of the New Testament, example (2b) from the 18th century version, and example (2c) from the 20th century version. Notice that the first verb form (*sarthu zen-ean* 'when he entered', Past Perfect-Perfective) is constant in the three versions. Yet, the second verb form, i.e., the one expressing prototypical perfective meaning, changes. In example (2a), we have a Periphrastic Aorist conveying perfective meaning (*ethor zedin* 'he came'). The auxiliary verb employed pertains to the root *-di-*, and the non-finite form is the Radical (*ethor*). In turn, in examples (2b) and (2c) we have Past Perfect-Perfectives expressing perfective meaning (*ethorri zitzaioen* and *hurbildu zitzaikon* 'he came to him'). The auxiliary verbs are forms of the verb *izan* 'to be' and the non-finite forms are Past Participles (*ethorr-i* and *hurbil-du*).[6]

The following examples (Mt 1: 24) show both a typical perfective occurrence and a context that is to be included within pluperfect meaning:

(3) a. *Joseph-ek* *egin* *zezan*
Joseph-ERG do 3.TR.AUX
aingeru-a-k *mana-tu* *zeraukan* *bezala*
angel-DET-ERG order-PTCP 3.had.to.3 like
'Joseph did as the angel had told him.'

b. *Joseph-ek* *egin* *zuen*
Joseph-ERG done 3.had
aingeru-a-k *mana-tu* *zioen* *bezala*
angel-DET-ERG order-PTCP 3.had.to.3 like
'Joseph did as the angel had told him.'

c. *Joseph-ek* *egin* *zuen*
Joseph-ERG done 3.had
Jaun-a-ren *aingeru-a-k* *agin-du* *zuen-a*
Lord-DET-GEN angel-DET-ERG order-PTCP 3.had-DET
'Joseph did what the Lord's angel had ordered.'

Again, example (3a) belongs to the 16th century version of the New Testament, example (3b) to the 18th century version, and example (3c) to the 20th century version. The verb form that changes now is the first one (Periphrastic Aorist *egin zezan* vs. Past Perfect-Perfective *egin zuen* 'he did'). This form represents again a prototypical perfective occurrence. The second verb form, in turn, is constant in the three versions; namely, a Past Perfect-Perfective in all three (see note 6). Notice that the second verb form conveys pluperfect meaning (although it is probably not a prototypical occurrence of the pluperfect).

A historical change shows up clearly from the above data. Prototypical perfective contexts were expressed by the Periphrastic Aorist in 16th century Basque (although as we will see in Table 2, Section 5.1, the Past Perfect-Perfective could already appear in those contexts by that time). In more recent times, however, the Past Perfect-Perfective has totally ousted the Aorist from prototypical perfective contexts. As for contexts that are not prototypical perfective occurrences but are closer to pluperfect, the Past Perfect-Perfective was already the main form to express them in the 16th century and has remained as so until present time. Thus, what we are witnessing is a change in the meaning conveyed by the Past Perfect-Perfective, from (mainly) pluperfect to (mainly) perfective. In Modern Basque, thus, the Past Perfect-Perfective expresses perfective meaning, but it can also express some non-prototypical instances of pluperfect, such as those exemplified by the first verb form of (2c) or by the second verb form of (3c).

4. One construction expressing more than one TAM meaning?

4.1. Language-specific categorization

Taking into account the discussion in Section 2.2 on cross-linguistic TAM categorization, the question arises now as to whether, language-specifically, one TAM construction in a given language may or may not have more than one meaning. That is, whether polysemy is allowed in TAM systems.

Traditionally, structuralist and formal approaches (perhaps because they tended to equate accuracy with strictness) have assumed that, when a given construction appears to have two different meanings, it actually reflects one of the two following possibilities: either (i) we are dealing with two different but homophonous forms (i.e., it is a case of two-forms-two-meanings), or (ii) we are dealing with different manifestations of one actual meaning (i.e., it is a case of one-form-one-meaning). Learning difficulty is also an argument employed by formalist approaches to exclude in-between possibilities, i.e., situations of polysemy.

Accordingly, these approaches propose that for any given grammatical construction, one can always establish a set of necessary and sufficient conditions such that every permitted use of the form will be allowed by these conditions. These models have been a constant feature of most mainstream theories of linguistics throughout the 20th century, including the generative enterprise. In fact, according to Rosch (1978: 35), "the attempt to impose such [necessary and sufficient] criteria on categories marks virtually all definitions in the tradition of Western reason".

In contrast, cognitive, typological and historical approaches have adopted more flexible models to categorization, in the belief that they "provide a more accurate characterization" (Comrie 1985: 19). These models base the understanding of language-specific categories on prototypes, instead of necessary and sufficient conditions. This way a given TAM construction may have more than one meaning, as we may talk about its basic meaning and its secondary meanings or uses.[7]

Unfortunately, psycholinguistic studies have not yet given us a complete understanding of TAM categorization. Hence, even the synchronic description of individual TAM systems is full of difficulties. For instance, the typological literature on TAM has found cross-linguistically recurring patterns of apparently-diverse categories that are expressed by the same form. Therefore, the typological method has been able "to demonstrate the semantic relatedness of grammatical categories that have otherwise been

thought to be widely separated" (Croft 1990: 166). A case in point is the relation between irrealis meaning and past imperfective (cf. Fleischman 1995). However, a critical problem arises regarding these recurring patterns.

Cross-linguistic recurrent patterns of different meanings expressed by the same form are a solid indicator of some diachronic relationship between the meanings involved, but it cannot be assumed that these meanings are always related in synchrony. As Haiman (1985: 38–39) puts it, "if the association of ideas in language is [nearly] open-ended … , then homonymy, even repeated in many different languages, may violate the [assumption that] recurrent identity of form must reflect [synchronic] similarity of meaning". In other words, while the existence of so much association of ideas and meanings in language leads us to postulating the existence of polysemy, we cannot assure that all categories that originated from the same source maintain a semantic relationship in synchrony.

We still need a method to synchronically discern between recurrent polysemy and recurrent homonymy. This is still a problem for both formal and functional approaches, which is reflected in uncertainties in the synchronic description of individual TAM systems. All in all, what functional-typological approaches do provide is a partial explanation or, put differently, a "placing" of the synchronic state based on the diachronic forces that led to its emergence. In Bybee, Perkins and Pagliuca's (1994: 213) words, "while the approach offered by grammaticalization theory does not resolve the synchronic problem, … we can stop searching for the one meaning that inheres in all the uses and start examining the processes that lead speaker/hearers from one use to another".

4.2. Illustration: Past imperfective and irrealis vs. perfect and perfective

By applying Dahl's methodology (cf. Section 2.2) we can discern whether language-specific TAM forms labelled in the same way, e.g., Perfect, or having parallel morphology, are or are not, synchronically, instances of the same cross-linguistic TAM category, i.e., the perfect.

Thus, if we apply Dahl's questionnaire to modern Western Basque, the (Present) Perfect-Perfective will turn out to pertain to the cross-linguistic category of perfect (even though it may also express hodiernal perfective), while the Past Perfect-Perfective will be included in the cross-linguistic category of perfective (even though it may still express pluperfect meaning marginally). Yet, if we apply the questionnaire to spoken modern Eastern

Basque, the (Present) Perfect-Perfective will turn out to belong in the cross-linguistic category of perfective, although perfect meaning would also be included in it.

Imagine now that we apply the questionnaire to the English Past. The result will be that the English Past will be included in the cross-linguistic category of past, yet the same form will also be used for irrealis meaning, as in *If you came with me, we would go to the movies*.

Now, these examples show that a given construction may convey two meanings that our typological TAM classifications consider to be separate. For instance, the modern Eastern Basque (Present) Perfect-Perfective may express perfect and perfective meanings. These are distinct major TAM meanings in Dahl's (1985) classification. In turn, the modern English Past may convey past and irrealis meanings.

The question that arises is the following. Are we dealing with cases of homonymy or polysemy here? As just mentioned, the question is not empirically resolved at this point. Tentatively, I would say that a construction conveying both past (imperfective) and irrealis seems to reflect a case of synchronic (recurrent) homonymy. That is, synchronically we have two different constructions expressing distinct meanings. However, does the Eastern Basque (Present) Perfect-Perfective represent the same case? In part, it does seem that perfect and perfective are separate meanings (and are therefore considered separately in our TAM classifications). Yet, it appears clear that perfect and perfective do have some synchronic relationship, even though it is not obvious what kind of relationship this may be.

Fortunately, the theory of grammaticalization is often able to explain, diachronically, these situations of homonymy or polysemy in terms of recurrent paths of grammaticalization. Again, while these diachronic explanations leave us at some ease, they do not resolve the synchronic problem of categorization.

5. One TAM meaning expressed by more than one construction?

5.1. Competition among TAM forms

The concept of competition among forms proves crucial for describing the language-specific TAM data of historical Basque, in both its synchronic and diachronic perspectives. That is, in my database, for every stage of language, there is always more than one form to express one and the same TAM meaning, e.g., present habitual (see Table 1).

Table 1. Present habitual in historical Basque (token-frequency)

	16th century	18th century	20th century
Synthetic Present	12 (4.9%)	9 (3.8%)	7 (3.0%)
Periphrastic Present	205 (84.4%)	208 (88.5%)	193 (83.5%)
Other constructions	26 (10.7%)	18 (7.7%)	31 (13.4%)
Total	243 (100%)	235 (100%)	231 (100%)

In Basque, the case that comes closest to a one-meaning-one-form situation is provided by perfective meaning in the 18th and 20th century texts. Here, it is one form (concretely the Past Perfect-Perfective) that appears in the database for the great majority of collected tokens (see Table 2).

Table 2. Pre-hodiernal perfective (non-fictional non-passive) in historical Basque

	16th century	18th century	20th century
Synthetic Past	11 (1.5%)	0	0
Periphrastic Aorist	435 (60.8%)	0	0
Past Perfect-Perfective	221 (30.9%)	672 (91.9%)	694 (95.9%)
Double-compound Past Perfect	44 (6.1%)	51 (7.0%)	24 (3.3%)
Other constructions	5 (0.7%)	8 (1.1%)	6 (0.8%)
Total	716 (100%)	731 (100%)	724 (100%)

5.2. Discussion: Optionality vs. coexisting grammars

A point that merits discussion is whether data such as those just presented, which so clearly indicate that each synchronic stage of language has an important component of overlap of forms for every TAM meaning, can be accurately represented by the discrete models proposed by formalist frameworks. The fact is that there always seems to be the possibility of assuming that the competition of forms is due to "coexisting grammars" rather than to "optionality" (see Kroch 1989; Lightfoot 1999). Now, if the competition of forms occurs regularly within the speech of one and the same speaker, as opposed to between different speakers, then the assumption of coexisting grammars within one speaker's speech may just look like an artificial gambit to try to fit the data into the theory. In other words, we would still need to provide a psycholinguistic model that would explain how one speaker handles two coexisting grammars.

5.3. The tendency towards one-meaning-one-form revisited

Despite the generalized existence of competition among forms in all stages of the language, the data in Aldai (2002) provide also evidence for a one-meaning-one-form tendency. Yet, it seems important to revise the one-meaning-one-form correspondence and to formulate it quite differently from the way formal structuralist approaches have tended to state it so far.

First, according to the data, the one-meaning-one-form correspondence does not seem to qualify as a theoretical primitive, but is rather a tendency or motivating factor; i.e., one factor among others possibly competing with it. Second, the tendency towards one-meaning-one-form is better observed in terms of frequency rather than in absolute terms. That is, while in absolute terms the database in Aldai (2002) always shows more than one form for every TAM meaning (see Tables 1 and 2 above), in statistical terms it is most often the case that one among those forms is considerably more important than the rest, with percentages of around 80–90% of the total of items, i.e., in token frequency, (and/or of the total of lexical verbs, i.e., in type-frequency). Third, the degree of the tendency towards a one-form-one-meaning correspondence seems to correlate with the centrality of the TAM meanings involved (as discussed below).

5.4. Centrality of TAM meanings and the one-meaning-one-form correspondence

We have seen in Section 2.2 that one of the main findings in works such as Dahl (1985), corroborated in Bybee, Perkins and Pagliuca (1994), is that, not only categories, but TAM systems themselves are organized in terms of central and peripheral meanings. We have also seen that past, perfective and future constitute a clear central group of TAM meanings, and that at least one of either past or perfective occurs nearly universally. Thus, the most central of TAM meanings (e.g., past perfective) tend to be crucial in the grammatical categorization of TAM systems. Central meanings tend to be assigned a specific TAM form, while non-central meanings tend to be expressed secondarily by (various) constructions primarily identified with central meanings (Kemmer 1992: 147–148).

Language-internally, we may hypothesize that the most central TAM meanings will be among those showing the lowest degree of competition between alternative constructions, while there can be more competition to convey non-central meanings. In other words, I predict that in a given lan-

guage past perfective, and other central TAM meanings, will tend to be expressed by one dominant form, closer to the ideal case of one-form for one-meaning.

The Basque data are in favour of this hypothesis. Compare the data on past perfective presented in Table 2 with the data on a non-central TAM meaning (or use), such as 'when'-future clauses, presented in Table 3.

Table 3. 'When'-future clauses in historical Basque

	16th century	18th century	20th century
Synthetic Present	7 (8.8%)	4 (5.1%)	4 (5.3%)
Periphrastic Present	30 (37.5%)	43 (54.4%)	49 (64.5%)
Present Subjunctive	29 (36.3%)	7 (8.9%)	1 (1.3%)
(Periphrastic) Future	9 (11.2%)	23 (29.1%)	20 (26.3%)
Other constructions	5 (6.2%)	2 (2.5%)	2 (2.6%)
Total	80 (100%)	79 (100%)	76 (100%)

'When'-future clauses do not constitute prototypical exemplars of future meaning, but they do not belong to the prototypical present either. 'When'-future clauses, thus, make up a non-central TAM meaning of their own. Therefore, the Basque data on 'when'-future clauses support the hypothesis of a lower one-meaning-one-form tendency for non-central meanings than for central meanings. There are no clearly dominant constructions to express 'when'-future for any documented period of Basque. (For the situation of perfective meaning in the 16th century, Table 2, see below.)

5.5. Gradual and abrupt changes

It has been common in the literature to relate, on the one hand, discrete approaches to grammar with abrupt changes, and, on the other hand, more fluid synchronic analyses with gradual changes. However, while formalists' discrete analyses do seem to always imply abrupt changes in grammars, more fluid analyses do not necessarily entail gradual changes in all cases. In other words, discrete analyses are very constraining, and practically rule out the possibility of synchronic variation and optionality, unless one either places variation out of grammars (e.g., in the performance or in the "triggering experience" of speakers; Lightfoot 1991: 160), or always analyses optionality as coexistence of divergent grammars (as I mentioned above). Thus, the diachronic counterpart of a synchronic discrete model seems to require that all changes in grammars have to be abrupt and catastrophic (cf. Lightfoot 1991: 157–173, 1999: 77, 148).

Conversely, there is not a necessary implication of gradualness in the assumptions on grammaticalization. The theory of grammaticalization has room for both more gradual and more abrupt changes. Also, a given change can be more gradual in one respect and more abrupt in another. Changes entailing TAM categorial reanalysis imply some abruptness. Yet, changes involving lexical diffusion may be mostly gradual (hence the complexity of lexical-semantic synchronic studies). (See McMahon 1994; Harris and Campbell 1995; Campbell 1998 for discussion.)

Another possible factor in the gradual vs. abrupt controversy is the centrality of the TAM meaning implicated in the change. It seems that changes involving central TAM meanings tend in general to be more abrupt than changes involving less central meanings. As a matter of fact, if the above synchronic hypothesis that the most central TAM meanings tend to have a lower degree of competition of forms is correct (Section 5.4), then this implies a diachronic counterpart making correlate central meanings with more abrupt changes. In other words, it seems we ought to propose that, since central meanings are crucial to the organization of TAM systems, speakers tend to assign one specific form to them, and to identify that form with the central meaning it expresses. It would appear as if speakers were more unconsciously sensitive about central meanings. Hence, if a new form comes to compete for a central meaning, and if it gets to be identified with it, then the displacement of forms would occur rather abruptly.

Regarding the Basque data (cf. Table 2), the shift involving perfective meaning (a central TAM meaning according to all criteria) that historical Basque underwent appears to be a quite abrupt one. While 16th century texts use most often the Periphrastic Aorist to convey perfective meaning (even though the Past Perfect-Perfective is also used), there is no trace of the Periphrastic Aorist employed as a perfective in practically all of the 17th century texts. We may say that the way perfective meaning was expressed in Basque was completely changed in a time span of around 100 years.[8]

6. Conclusions

In this chapter, I have discussed some issues related with discreteness and non-discreteness of TAM. To that end, I have first (Section 2) introduced a theoretical framework for the study of TAM, based on the foundational studies of TAM within typological-functional approaches. I have distinguished there two complementary lines of research. Synchronically, the

study of TAM has among its primary goals to identify the cross-linguistic categories of tense-aspect-mood and to establish the relationship among them. Although I have outlined in Section 2.2 a typological method towards identifying TAM categories, this task is still fraught with difficulties. In a nutshell, only direct psycholinguistic evidence could clarify whether or not TAM meanings that originate in the same form are synchronically analysed by speakers as pertaining to the same category. The diachronic study of TAM, in turn, is in part better understood. Not only do we know from typological comparison many paths of grammaticalization that the TAM constructions may follow, but we also have sound hypotheses about the psycholinguistic motivations behind those paths.

In Section 3, I introduced some Basque data, which mainly show a change in the way perfective meaning was historically expressed. Then, I focused on the discussion on discreteness and non-discreteness. In Section 4, I reviewed the question whether one form may have more than one TAM meaning. My conclusion was that, since we do not have a direct means to measure how speakers categorize TAM, it is difficult to address the question at hand. Still, it does seem that a polysemic state may be among those that speakers can handle in their processing of TAM categories. In any event, the theory of grammaticalization can help us understand (explain in a weaker sense) the various synchronic possibilities that a given source of grammaticalization may give rise to.

In Section 5, finally, I addressed the opposite situation, namely, whether one given TAM meaning may be expressed by more than one form. Here the data is more revealing than in the previous case. The Basque data in my database clearly display that one and the same speaker (writer in this case) can use different constructions to express the same TAM meaning. Still, there is a tendency for a one-meaning-one-form correlation, but only in statistical terms. The data also support the hypothesis that central TAM meanings tend to be expressed by one dominant form, while non-central meanings (uses) may show a greater amount of competition among different forms. All in all, although more psycholinguistic research would be needed regarding these issues, I think flexible models of TAM categorization are more accurate to account for the data we have. Thus, optionality (not only coexisting grammars), prototypes (not only necessary-and-sufficient conditions), or polysemy (not only monosemy and homonymy) seem to be necessary concepts to correctly capture the processing and learning of TAM categories by speakers.

Notes

1. This chapter has profited from comments provided by two anonymous reviewers and, most especially, by the volume editors Matti Miestamo and Bernhard Wälchli. The work has been partly possible thanks to a post-doctoral grant from the Basque Government's Department of Education, Universities and Research. List of abbreviations used: 3 third person, ALL allative ('to'), AUX auxiliary, DET determiner, ERG ergative, GEN genitive, INTR intransitive, LOC locative, PL plural, PTCP participle, TR transitive.
2. The term "system" is to be understood here in a very loose way. I do not mean to imply that all TAM categories are necessarily organized in systems of oppositions.
3. The following metaphor can be used to illustrate the point at issue: Let us imagine the conceptual space of tense-aspect-mood as a blackboard where every notional TAM meaning, sense, nuance or even occurrence is represented by a point. In truth, all TAM meanings, senses, nuances, etc. would be descriptively equal to each other. Yet, it is the speakers' perception that not only discerns but also hierarchizes these concepts. Thus, the speakers of all languages together would put some of these concepts into clusters of close points on the blackboard, while some other concepts would show up rather separately. Then, the point-clusters would correspond to universal TAM meanings, and the biggest clusters would correspond to the most central meanings among them. Of course, this representation could be subject to small variation, as the contribution to the clustering by speakers of each individual language would be influenced by the formal categories of that language.
4. Following Comrie's (1976: 10) policy, I write the language-specific names of TAM forms (e.g., of Basque) with initial capitals, while I do not use initial capitals for the TAM meaning labels adopted in the Comrie-Dahl-Bybee approach, which are meant to be cross-linguistically valid.
5. The name Perfect-Perfective intends to be a compromise between the source of grammaticalization and the actual meaning of these two constructions.
6. The presence of dative agreement in examples (2b) and (2c) and its absence in (2a) is not relevant for the issue under discussion. The same holds for examples (3a) and (3b) vs. (3c), with and without dative agreement, respectively.
7. It would seem, then, that language-specifically speakers may also have a perception of TAM constructions based on a focus and a periphery. This way of perceiving TAM constructions may also be an advantage rather than a burden for learning and processing of categories.
8. Another change regarding perfective meaning has recently occurred in spoken Eastern Basque (thus, it is not reflected in the data at hand). The Present Perfect-Perfective has replaced or is replacing the Past Perfect-Perfective from pre-hodiernal perfective contexts. This change appears also as rather abrupt, since many written texts (all the more, religious texts) do not reflect it yet,

while it seems to be almost totally adopted in spoken Labourdin and even more in more eastern dialects.

References

Aldai, Gontzal
2002 The grammaticalization of present and past in Basque. Ph.D. diss., Department of Linguistics, University of Southern California.

Bybee, Joan
1985 *Morphology: A Study of the Relation Between Meaning and Form*. Amsterdam/Philadelphia: John Benjamins.

Bybee, Joan, and Östen Dahl
1989 The creation of tense and aspect systems in the languages of the world. *Studies in Language* 13: 51–103.

Bybee, Joan, Revere Perkins, and William Pagliuca
1994 *The Evolution of Grammar: Tense, Aspect and Modality in the Languages of the World*. Chicago/London: University of Chicago Press

Campbell, Lyle
1998 *Historical Linguistics: An Introduction*. Edinburgh: Edinburgh University Press. [Also published by MIT Press, Cambridge, Massachusetts.]

Comrie, Bernard
1976 *Aspect: An Introduction to the Study of Verbal Aspect and Related Problems*. Cambridge: Cambridge University Press.
1985 *Tense*. Cambridge: Cambridge University Press.

Croft, William
1990 *Typology and Universals*. Cambridge: Cambridge University Press.

Dahl, Östen
1985 *Tense and Aspect Systems*. Oxford/New York: Blackwell.

Fleischman, Suzanne
1995 Imperfective and irrealis. In *Modality in Grammar and Discourse*, Joan Bybee, and Suzanne Fleischman (eds.), 519–551. Amsterdam/Philadelphia: John Benjamins.

Haiman, John
1985 *Natural Syntax: Iconicity and Erosion*. Cambridge: Cambridge University Press.

Harris, Alice, and Lyle Campbell
1995 *Historical Syntax in Cross-Linguistic Perspective*. Cambridge: Cambridge University Press.

Kemmer, Suzanne
1992 Grammatical prototypes and competing motivations in a theory of linguistic change. In *Explanation in Historical Linguistics*, Garry Davis, and Gregory Iverson (eds.), 145–166. Amsterdam/Philadelphia: John Benjamins.
Kroch, Anthony
1989 Reflexes of grammar in patterns of language change. *Language Variation and Change* 1: 199–244.
Lightfoot, David
1991 *How to Set Parameters: Arguments from Language Change*. Cambridge, Massachusetts: MIT Press.
1999 *The Development of Language: Acquisition, Change, and Evolution*. Malden/Oxford: Blackwell.
McMahon, April
1994 *Understanding Language Change*. Cambridge: Cambridge University Press.
Rosch, Eleanor
1978 Principles of categorization. In *Cognition and Categorization*, Eleanor Rosch, and Barbara Lloyd (eds.), 27–48. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Symmetric and asymmetric encoding of functional domains, with remarks on typological markedness

Matti Miestamo

1. Introduction

In Miestamo (2003, revised as Miestamo 2005), I proposed a typological classification of the structures that languages use for encoding *standard negation*, i.e., the negation of declarative verbal main clauses. The classification was based on structural similarities and differences between negatives and affirmatives, the main division being between symmetric and asymmetric structures. In this chapter, I will elaborate on the principles of classification and explanation proposed in my earlier work, show how they can be applied to other functional domains beyond standard negation and discuss the relationship between (a)symmetry and typological markedness.[1]

The term functional domain dates back to Givón (1981), and can be characterized as any domain of related (semantic or pragmatic) functions that (one or more) language(s) encode with the formal means they possess; examples of functional domains include tense, negation and referentiality. Functional-domain typology examines the ways in which languages morphosyntactically encode functional domains, and typically proceeds as follows (see also Givón 1981; Stassen 1985: 1–23; Miestamo 2005: 26–50): The object of study – a functional domain or a specific function within a domain – is defined in a cross-linguistically applicable way, a language sample suitable for tackling the research questions is selected, and on the basis of the definition of the object, the relevant data found in the sample languages are then entered into the database that is to serve as the empirical basis of the study. The cross-linguistic variation found in the morphosyntactic encoding of the functional domain is then described, usually in the form of a typological classification of the encoding strategies found. Other cross-linguistic generalizations such as the frequencies and geographical distributions of the different types of encoding are also observed, and it is examined whether the types correlate cross-linguistically with other grammatical features. Finally, explanations are proposed for the cross-linguistic findings; these are usually functional in nature (in the

broad sense that they refer to functional aspects of language outside linguistic structure itself, e.g., meaning, use, or processing).

Haspelmath (2006) discusses the many ways in which the term markedness has been used in linguistics, and warns against over-using it especially in cases where more concrete terms would be more appropriate. The foundations of the typological theory of markedness were laid in Greenberg (1966). In this chapter, markedness is intended in the sense of typological markedness, using the term and definition of Croft (2003: 87–101, 110–117): it is defined using the structural, behavioural and frequency criteria. According to the structural criterion, for reasons of clarity henceforth referred to as the *overt coding criterion*, the marked category is expressed by at least as many morphemes as the unmarked one. There are two *behavioural potential criteria*: the *paradigmatic potential* of the unmarked category is at least as high as that of the marked one, i.e., at least as many grammatical distinctions can be made in connection with the unmarked category as with the marked one (Croft uses the term inflectional potential, but I prefer the more general term paradigmatic here); the *distributional potential* of the unmarked category is at least as high as that of the marked one, i.e., the unmarked category may itself be embedded in at least as many contexts as the marked one. According to the *frequency criterion*, the unmarked category occurs at least as frequently as the marked one. The concept of typological markedness is highly relevant here as it can help us in determining which functional domains and which categories within them are most suitable for analysis in terms of (a)symmetry. Furthermore, as will be seen further below, the symmetry-asymmetry approach has repercussions on discussions of markedness itself.

I will now clarify some central concepts and terms. Croft (2003) uses the term category for a higher level concept: number is a category and singular and plural are values of the category; accordingly, affirmation and negation would be values of the category polarity. I do not make this distinction here, but use the term category for the lower level as well. It should also be borne in mind that (the limits of) categories differ from language to language, and strictly speaking, categories are language-specific; cross-linguistic comparability is based on function (semantics/pragmatics). Acknowledging that structure can be found in meaning as well, I will use "structure" and "structural" to refer to formal linguistic structure. What is meant by asymmetry in this paper will become clear in Section 2, but it is worth noting at the outset that I am not talking about asymmetries in the syntagmatic sense (between different parts of an utterance) as do, in differ-

ent ways, e.g., Haiman (1985: 73), Hawkins (2004: 223–254) and Kayne (1994).

This chapter is organized as follows: Section 2 discusses the principles of classification – symmetric and asymmetric encoding – taking examples from standard negation; Section 3 introduces the principles of explanation based on language-internal and language-external analogy; Section 4 shows how the principles can be applied to the domain of polar interrogation; Section 5 discusses the relationship between asymmetry and typological markedness, and Section 6 consists of some concluding remarks.

2. Classification – symmetric and asymmetric structures

In this section I will define the principles of a generally applicable classification of encoding strategies with a main division between symmetric and asymmetric structures. I will start by showing how I used these principles in classifying standard negation structures in my earlier work (Miestamo 2000, 2003, 2005). The standard negation structures found in the world's languages can be divided into symmetric and asymmetric according to whether or not the structure of the negative differs from that of the corresponding affirmative. This division is made from the point of view of constructions on the one hand and paradigms on the other. Clauses containing symmetric negative constructions differ from the corresponding affirmatives only by the presence of (a) negative marker(s) (e.g., in Taba 1), but in asymmetric constructions further differences – asymmetries – are found as well (e.g., in Finnish 2, see below for analysis).[2]

(1) Taba (Austronesian, South Halmahera – West New Guinea; Bowden 1997: 388)

a. *n-han* *ak-la*
3SG-go ALL-sea
'She's going seawards.'

b. *n-han* *ak-la* ***te***
3SG-go ALL-sea **NEG**
'She's not going seawards.'

(2) Finnish (Uralic, Finnic)

a. *laula-n*
sing-1SG
'I sing.'

b. ***e-n*** *laula*
NEG-1SG sing.CNG
'I do not sing.'

In symmetric paradigms, the members of the paradigms used in affirmatives and negatives show a one-to-one correspondence (e.g., in Romanian

3), whereas in asymmetric paradigms the correspondences are not one-to-one (e.g., in Maung 4 and Burmese 5). Paradigmatic asymmetry usually consists of neutralization of grammatical distinctions.[3] (In the Romanian and Maung examples the constructions are symmetric, whereas in Burmese the construction is asymmetric; see below for more detailed analyses).

(3) Romanian (Indo-European, Romance)

a. *(a) cânta* 'to sing' PRES

	AFF	NEG
1SG	*cânt*	***nu*** *cânt*
2SG	*cânţi*	***nu*** *cânţi*
3SG	*cântă*	***nu*** *cântă*
1PL	*cântăm*	***nu*** *cântăm*
2PL	*cântaţi*	***nu*** *cântaţi*
3PL	*cântă*	***nu*** *cântă*

b. *(a) cânta* 'to sing' IMPF

AFF	NEG
cântam	***nu*** *cântam*
cântai	***nu*** *cântai*
cânta	***nu*** *cânta*
cântam	***nu*** *cântam*
cântaţi	***nu*** *cântaţi*
cântau	***nu*** *cântau*

(4) Maung (Australian, Iwaidjan; Capell and Hinch 1970: 67)

a. *ŋi-udba*
1SG>3-put
'I put.'

b. *ni-udba-ji*
1SG>3-put-IRR.NPST
'I can put.'

c. ***marig*** *ni-udba-ji*
NEG 1SG>3-put-IRR.NPST
'I do not [/cannot] put.'

(5) Burmese (Sino-Tibetan, Burmese-Lolo; Cornyn 1944: 12–13)

a. *θwâ-dé*
go-ACT
'goes, went'

b. *θwâ-mé*
go-POT
'will go'

c. *θwâ-bí*
go-PERF
'has gone'

d. ***ma****-θwâ-****bû***
NEG-go-**NEG**
'does/did/will not go, has not gone'

Furthermore, asymmetric negation is divided into subtypes according to the nature of the asymmetry (which can be constructional or paradigmatic in the different subtypes; these are cross-cutting parameters). In subtype A/Fin negatives, the finiteness of the lexical verb is reduced or lost, and a new finite element (most commonly an auxiliary verb) usually appears in the negative; in the Finnish negative construction (2), the negative verb *e-* appears as the finite element of the clause, carrying person inflection and the lexical verb is in the non-finite connegative form. In subtype

A/NonReal, negatives are obligatorily marked for a category that refers to non-realized states of affairs; in Maung negation is marked with *marig* (4c) and the construction is symmetric as compared with the affirmative irrealis (4b) (there is no constructional asymmetry whatsoever), but there is paradigmatic asymmetry since negatives obligatorily use the irrealis form of the verb and the distinction between realis and irrealis (4a,b) is lost in the negative (4c). There is a marginal subtype A/Emph defined by the presence of marking that denotes emphasis in non-negatives (not exemplified here to save space). In subtype A/Cat negatives, the marking of grammatical categories is different from their marking in affirmatives in other ways, the most commonly affected categories being tense-aspect-mood (TAM) and person-number-gender (PNG); in Burmese (5) the affirmative paradigm distinguishes between actual, potential and perfect, the negative construction is asymmetric since the postverbal part of the discontinuous negative marker replaces the TAM markers, and there is also paradigmatic asymmetry as these TAM distinctions are then neutralized.

Let us now see how the principles of classification can be applied to functional domains beyond standard negation. In principle, any structure encoding a category C within a functional domain can be classified as symmetric or asymmetric according to whether it differs – in addition to the (simple) marking of category C – from the structure expressing a category D which is related in a relevant sense. Some categories are of course more easily analysable in these terms than others. In the case of negation vs. affirmation, we have a clear semantic relation between two opposite categories. The study of negation is also a natural place to start looking for symmetry and asymmetry in linguistic structure, because there exists a long tradition in philosophy and logic for treating affirmation and negation as either symmetric or asymmetric (see Horn 1989 for a thorough discussion). What makes it typologically interesting is that very little asymmetry is found in well-known European languages which have been so influential in the development of virtually all modern linguistic theories. This approach is thus also theoretically interesting in highlighting the vast amount of structural asymmetry between affirmation and negation to a large extent still unknown to many linguists. In general, if we want to describe the structures expressing a given function in terms of symmetry and asymmetry, we need a reference point with which to compare the structures. A plausible reference point is provided by the category identifiable as the unmarked counterpart of the category being studied. Thus, a functional domain where a clear markedness pattern between two categories can be identified lends itself especially well to analysis in terms of symmetry and

asymmetry. Negatives are clearly marked vis-à-vis affirmatives. An obvious candidate beyond (standard) negation is polar interrogation; declaratives can be identified as the unmarked counterpart of interrogatives, and we can then examine how the structure of interrogatives differs from the structure of declaratives. A clear markedness pattern is, however, not a prerequisite for such an investigation and speaking about (a)symmetry does not presuppose a theory of markedness. I will come back to the question of the applicability of the principles to different domains in Section 6.

The principles of classification can be defined in more general terms as follows. The structures expressing a given category C can be divided into *symmetric* and *asymmetric* according to whether and how they differ from the structures expressing the related category D. Note that (morpho-)phonological differences between structures coding these categories are not asymmetry in the relevant sense, since they depend on more general principles operational in the language and do not reveal anything specific about the encoding of the functional domain in question. The symmetry-asymmetry distinction may be observed from the point of view of *constructions* on the one hand and *paradigms* on the other. Clauses (or phrases, more generally structures) expressing category C with a *symmetric construction* show no further differences in comparison to clauses expressing the corresponding category D than the presence of the marker(s) of category C.[4] In *asymmetric constructions* the structure of the clause changes in other ways too; thus, there are further structural differences between clauses expressing category C with an asymmetric construction and clauses expressing the corresponding category D. In *symmetric paradigms*, the members of the paradigms used in connection with categories C and D show a one-to-one correspondence. In *asymmetric paradigms*, the correspondences between the members of the paradigms used in connection with categories C and D are not one-to-one. Constructional and paradigmatic asymmetry are defined independently of each other – paradigms can be symmetric with asymmetric constructions (in Finnish the construction is asymmetric [2], but every affirmative form has its own negative counterpart just like in Romanian [3]), or asymmetric with symmetric constructions (in Maung [4]), and constructional and paradigmatic asymmetry may be connected in one and the same structure (Burmese [5]).

Cross-cutting the constructional-paradigmatic distinction, subtypes of asymmetric structures may be established. The subtypes are defined in terms of the nature of the asymmetry found and will differ depending on the functional domain under study. The subtypes established for asymmetric standard negation were briefly discussed above. In defining the sub-

types, attention is primarily paid to functional effects of the structural differences found between the categories under study. Purely formal differences with no functional connections are taken into account when they are specific to the marking of the category in question, and not automatic ([morpho]phonological) processes determined by more general principles operational in the language, but whenever functional connections can be found, they will be considered first in deciding what the subtypes are. They lend themselves better to functional explanation in terms of the analogy-based model to be introduced in Section 3.

Typological classifications may be arrived at either deductively or inductively. In the deductive case, the (logically possible) types are given beforehand and the cross-linguistic investigation tells us which types are found in the world's languages; word order typology is a prime example of deductive typologizing. Inductive approaches study cross-linguistic variation and decide on the theoretically relevant types only when the cross-linguistic variation has been charted, as in Stassen's (1985) typology of comparatives. Classification in terms of (a)symmetry combines these two approaches. The symmetry vs. asymmetry and constructional vs. paradigmatic parameters are given beforehand, but the subtypes of asymmetric encoding can be established for each domain only on the basis of the empirical cross-linguistic work done.

Before moving on to issues of explanation, two remarks are in order. Firstly, although the cases of paradigmatic asymmetry discussed so far – and indeed most cases of paradigmatic asymmetry found in standard negation – involve *neutralization* of grammatical distinctions, there are also other types of paradigmatic asymmetry (Miestamo 2005: 54–55, 125–127). *Paradigmatic displacement* refers to cases where the distinction between categories X and Y is not lost with category C, but still the form used for X cannot be used in connection with C and the form of Y is used instead. In Tunica, for example, affirmatives make a distinction between habitual and semelfactive, but only the semelfactive form may occur in negatives; the distinction is, however, maintained since different negative suffixes are used with the semelfactive base for these two aspects (in both cases the construction is symmetric). *Different-system* paradigmatic asymmetry is found, e.g., in Swahili where, as argued by Contini-Morava (1989), completely different TAM systems are used in affirmatives and negatives.

Secondly, we may observe asymmetries connected to different categories expressed in one and the same utterance, e.g., in a negative imperative in Finnish. It is very common in the world's languages that negation is marked differently in imperatives and declaratives (see van der Auwera

and Lejeune 2005). Finnish uses a negative auxiliary construction in both declarative (see example 2 above) and imperative negation, and thus has asymmetry between negatives and their positive counterparts in both declaratives and imperatives. The latter, however, use a different negative auxiliary (*äl-*), so negation itself is marked differently in declaratives and imperatives. Looking at this from the point of view of declarative vs. imperative, we may note that it is in fact asymmetry between declaratives and imperatives; that negation is marked differently is a structural difference between declaratives and imperatives in addition to the simple marking of the declarative-imperative distinction.

3. Explanation – language-internal and language-external analogy

Linguistic structures may be classified in many different ways, and not all parameters of classification are theoretically equally relevant. The theoretical interest in describing structures in terms of the symmetry-asymmetry distinction is that the types thus established can then be functionally explained by language-internal and language-external analogy.[5] In this section, I will first illustrate the model of explanation by showing how it works for the typology of standard negation, and then discuss the principles of explanation in more general terms.

Before going into the model itself, a brief look at the functional (semantic and pragmatic) asymmetry between affirmation and negation is in order. There are various ways in which affirmation and negation differ on the functional level. The following aspects of this asymmetry are of interest here (Miestamo 2005: 195–200; see also Givón 1978, 2001: 369–398):

- Stativity vs. dynamicity: affirmatives may report stative and dynamic states of affairs, but negatives prototypically report stative ones; a clause that negates an event refers to no change in the universe, i.e., to a stative state of affairs.[6]
- Reality-status: semantically affirmatives belong to the realm of the realized whereas negatives belong to the non-realized.
- Discourse context: negatives are prototypically used in contexts where the corresponding affirmative is somehow present or supposed, i.e., as denials, whereas the typical contexts of affirmatives are not restricted in this way.

In Miestamo (2000, 2003, 2005), I proposed to explain the different types of standard negation as follows. Symmetric negatives copy the lin-

guistic structure of the affirmative and are thus language-internally analogous to their affirmative counterparts. Asymmetric negatives copy aspects of the functional-level asymmetry between affirmation and negation and are thus language-externally analogous to the functional asymmetry. In the different subtypes of asymmetric negation we see different aspects of the functional asymmetry conventionalized in grammar: the stativity of negation motivates subtype A/Fin, the semantic connection between negation and other conceptualizations of the non-realized is behind subtype A/NonReal, and the prototypical discourse context of negatives motivates, in different ways, both subtype A/Emph and those subtype A/Cat structures where grammatical distinctions are neutralized. These explanations are discussed in detail in Miestamo (2005: 195–235).

In general terms, the principles of explanation can be formulated as follows: The symmetric type expressing a given category C copies the linguistic structure of the corresponding category D and is thus based on *language-internal analogy* between the linguistic structures encoding these categories. It is functionally motivated by pressure for system cohesion, which, in turn, is ultimately motivated by economy of storage and processing.[7] The asymmetric type expressing category C reflects, by *language-external analogy*, functional (i.e., strictly speaking language-external) asymmetry between the two categories. The functional asymmetry between the categories will naturally be different in different cases – negation has a set of typical functional properties and these differ from the functional properties of affirmation; similarly, e.g., interrogation has a set of typical functional properties and these differ from the functional properties of declaration. The functional properties have to be studied in each case to see if there are functional asymmetries that could be proposed as functional motivations for the structural asymmetry found. Different aspects of the functional asymmetry may be found to explain different subtypes of asymmetric structures. This kind of language-external analogy from function to form is usually referred to as iconicity, the functional properties of the categories being reflected in the linguistic structures that express the categories; according to Itkonen (1994), iconicity is a special case of the highly general cognitive process of analogy.[8] The motivations are given here as general principles for explaining the existence of the cross-linguistically recurring types. The two different types of analogy and the different aspects of functional asymmetry mediated by language-external analogy are competing motivations and different structures in different languages are due to the different weights that languages give to these dif-

ferent factors; I will not go into why a given structure in a given language has been shaped by one factor instead of another.

4. Application to another domain – (a)symmetric polar interrogatives

This section will discuss the application of the principles of classification and explanation to another domain, viz. polar interrogation.[9] The discussion is based on a preliminary investigation of the domain in an areally and genealogically stratified pilot sample of 24 languages (see Miestamo 2004). Being the unmarked counterpart of polar interrogatives, declaratives provide the relevant reference point with which to compare interrogative structures. Therefore, I examine structural differences between interrogatives and declaratives. I focus on neutral polar interrogation in verbal main clauses, e.g., English *Is the dog barking?* (vs. *The dog is barking*). Although broad typological surveys of polar interrogatives exist (Ultan 1978; Dryer 2005), none of them have focused on how the structure of interrogatives differs from declaratives. Schmid (1980) examined co-occurrence restrictions in interrogatives, but her sample was rather restricted.

If we apply the principles of classification formulated in Section 3 to polar interrogatives, substituting interrogative for category C and declarative for the related category D, we can indeed find symmetric and asymmetric interrogative constructions and paradigms in the world's languages. A symmetric construction is found in Malayalam (6), the interrogative marker *-oo* being the only structural difference from the declarative. The paradigm is symmetric in Finnish (7), where every declarative has its own unique interrogative counterpart and no grammatical distinctions are lost.

(6) Malayalam (Dravidian, Southern Dravidian; Asher and Kumari 1997: 8)

a. *avaḷ varum*
she come.FUT
'She will come.'

b. *avaḷ varum-**oo***
she come.FUT-**Q**
'Will she come?'

(7) Finnish (Uralic, Finnic)

a. *laulaa* 'to sing', PRESENT

	DECLARATIVE	INTERROGATIVE
1SG	*(minä) laulan*	*laulan**ko** (minä)*
2SG	*(sinä) laulat*	*laulat**ko** (sinä)*
3SG	*hän laulaa*	*laulaa**ko** hän*

1PL	*(me) laulamme*	*laulamme**ko** (me)*
2PL	*(te) laulatte*	*laulatte**ko** (te)*
3PL	*he laulavat*	*laulavat**ko** he*

As to the construction in Finnish (7), the presence of the interrogative marker *-ko* is, in many cases, the only difference between declaratives and interrogatives, but the inversion of word order in cases where an overt (pro)nominal subject is present in the clause makes the construction asymmetric in these cases (in [Standard] Finnish subject pronouns are optional in non-third persons).

In Awa Pit (8) we find an asymmetric construction where the interrogative marker is the verbal element *ki* taking person marking and the lexical verb appears in the infinitive.

(8) Awa Pit (Barbacoan; Curnow 1997: 190, 324)

a. *(nu=na)* *pala* *ku-mtu-y*
(2SG=TOP) plantain eat-IMPF-NLCT
'You are eating plantains.'

b. *tɬawa* *a-n* ***ki**-s?*
tomorrow come-INF **Q**-LCT
'Are you coming tomorrow?"

Curnow (1997: 326–328) does not treat *ki* as a verb, because it has fewer verbal characteristics than true auxiliary verbs in Awa Pit. Still, it does have some, and since it forces the lexical verb to appear in a non-finite form, it can be analysed as a finite element. In the Awa Pit examples we can also find differences in person marking, but there is not enough space here to go into the system of marking locutor and non-locutor in Awa Pit.

Awa Pit has another interrogative construction (9) with the past interrogative suffix *-ma* occurring in the same slot with many TAM markers and being thus mutually exclusive with them; there is paradigmatic asymmetry as distinctions made by these TAM markers in the declarative are lost in the interrogative. In Lavukaleve, the declarative distinguishes between focus and non-focus constructions (10a,b), but polar interrogatives are obligatorily focus constructions since the interrogative marker *mi* is itself a focus marker (10c); the distinction between focus and non-focus is thus lost in interrogatives and the paradigm is asymmetric. (Note that the constructions are asymmetric in both cases – the presence of interrogative markers is not the only structural difference between interrogatives and the

corresponding declaratives: in Lavukaleve a different focus marker is used and in Awa Pit the interrogative marker replaces the TAM markers.)

(9) Awa Pit (Barbacoan; Curnow 1997: 199, 221, 323)
a. *nu=na* *juan=ta* *pyan-t-zi*
2SG=TOP Juan=ACC hit-PST-NLCT
'You hit Juan.'
b. *demetrio* *a-ka=na* *kal* *ki-mtu-ata-w*
Demetrio come-when=TOP work work-IMPF-PST-LCT
'When Demetrio came, I was working.'
c. *anshik=na* *a-**ma**-s*
yesterday=TOP come-**Q.PST**-LCT
'Did you come yesterday?'

(10) Lavukaleve (Solomons East Papuan; Terrill 2003: 38, 316, 452)
a. *legis* *e-kae-e* *o-mi*
kite(N) 3SG.N.OBJ-put.up-NMLZ 3SG.POSS-special.thing(N)
tuna-Ø *fi*
be.really-SG.N 3SG.N.FOC
'That's the special thing for kite-flying.'
b. *o-na* *o-re-a* *tuna-a* *la*
3SG.F.OBJ-INCL 3SG.SUBJ-say-SG.F be.really-SG.F SG.F.ART
'(He took the coconut) To the one she had really said.'
c. *"tuna-Ø* ***mi**?"* *hide* *a-e-re-ge*
be.really-SG.N **3SG.N.Q.FOC** thus 3SG.M.OBJ.SBRD-say-ANT
'"Is it really true?" he said.'

In many languages, as is well known, polar interrogation is marked simply by a final rise in intonation; this is the case in Ma'di (11).

(11) Ma'di (Nilo-Saharan, Moru-Ma'di; Blackings and Fabb 2003: 632)
a. *ɲɨ́* *`mū* *rá*
2SG NPST.go AFF
'You will definitely go.'
b. *ɲɨ́* *`mū* *rá* ´
2SG NPST.go AFF **Q**
'Will you definitely go?'

The analysis of these constructions is not straightforward. We may take them as asymmetric in the sense that the interrogative intonation replaces the declarative intonation and thus changes the intonational structure of the clause. However, intuitively it might be odd to see the structure of the clause as different in these cases. The construction could also be analysed

as symmetric in two different ways. In the first analysis, there are no structural differences with respect to the corresponding declarative in addition to the intonational marker of interrogation, if we regard the intonation of the declarative as a phonetic default intonation with no structural role; such a view could, however, be accused of playing down the role of intonation in grammar. In the second analysis, we could say that when a marker of category C replaces the marker of the corresponding category D, but does not affect the marking of other categories or change the structure in any other way, the construction could be analysed as symmetric. Such an analysis would then have to be adopted for segmental markers as well; no cases were found with negation – overt markers of "affirmation" always seem to be markers of either emphatic affirmation or indicative in contrast with other moods, not simply unmarked counterparts of negation – but for other domains this could turn out to be a useful modification of the principles of classification. In Miestamo (2004), I treated the intonation interrogatives as symmetric.

Some preliminary observations about the possible subtypes of asymmetric polar interrogation can be made on the basis of the 24-language pilot sample. The following cross-linguistically recurring types can be identified. There are three languages, Khoekhoe, Lavukaleve (10), and Mosetén, in which asymmetry concerning focus (or emphasis) marking is found, and in all three cases the asymmetry is paradigmatic, a focus-non-focus distinction being lost in favour of the use of a focus construction in interrogatives. Another possible subtype may be formed by the constructions where the lexical verb loses its finiteness, which happens in three languages in the 24-language sample: Awa Pit (8), Halkomelem, and Meithei; in the first two there is a verbal question element acting as the finite element of the interrogative clause.[10] Furthermore, there are eight languages in which the marking of grammatical categories in interrogatives differs from their marking in declaratives in other ways, all of these cases being constructional asymmetry (only in Awa Pit [9] also paradigmatic); whether further subtype divisions can be made among these cases is to be addressed in future research. No cases of question marking by word order inversion were found in the sample (according to Dryer 2005, these constructions are found commonly in European languages only); whether inversion of subject-verb word order could also be seen as focus-related asymmetry – in the sense that putting the finite verb in initial position might serve as focusing the polarity of the sentence – will be another matter for future research.

A few words need to be said about how the principles of explanation can be used for symmetric and asymmetric polar interrogatives. As sym-

metric structures in general, symmetric polar interrogatives are accounted for by language-internal analogy. Asymmetric polar interrogatives are explained by language-external analogy where the linguistic structure of the interrogative copies different aspects of functional-level asymmetry between interrogation and declaration. What the relevant aspects of this asymmetry are and how they motivate asymmetric interrogatives will not be addressed here – this can only be done when a more definitive typology of polar interrogation has been established on the basis of an extensive sample. If such a study corroborates the existence of, e.g., the focus subtype proposed above, the principles of explanation will lead us to expect that there is some focus-related functional asymmetry between declaratives and interrogatives. Naturally, we cannot take the circular approach of saying that because we find focus constructions to recur in the world's languages, there must be focus-related functional asymmetry between declaratives and interrogatives, which can then be used to explain the structural subtype of asymmetric interrogation. To be able to argue for such an explanation, we must study the functional differences between declaratives and interrogatives in detail and find independent semantic or pragmatic evidence for focus-related asymmetry, possibly supported by performance data from languages where it has not been conventionalized in grammar.

Since this chapter is primarily concerned with general theoretical and methodological issues rather than with interrogatives, I will not discuss the details of the classification and explanation of interrogatives any further – the 24-language sample would not even suffice to allow any conclusions about this functional domain. However, these data are adequate for illustrating my main point: the model of classification and explanation can be fruitfully applied to functional domains beyond (standard) negation.

5. Discussion – asymmetry and typological markedness

It is clear that the concept of typological markedness is relevant to the applicability of my principles of classification and explanation to different functional domains, but the relationship between markedness and (a)symmetry needs to be discussed in other respects as well. As already noted above, asymmetry and markedness are definable independent of each other, but there are some obvious connections that need to be made explicit. I will start by showing how the overt coding, behavioural potential and frequency criteria of typological markedness (see Section 1) reveal markedness relations between the category pairs discussed above. Taking

negation as an example, we may note that it satisfies, first of all, the overt coding criterion – no constructions are found in the world's languages where affirmation but not negation would be overtly coded.[11] Negation also satisfies the behavioural potential criteria, paradigmatic neutralizations being common in negatives and negatives also being less free to occur in different syntactic contexts than affirmatives. As to the frequency criterion, negatives have much lower textual frequency than affirmatives (see Hakulinen, Karlsson, and Vilkuna 1980: 120–121; Givón 2001: 373).

How, then, do these criteria relate to the symmetry-asymmetry model of classification and explanation introduced above? There is no reason to expect that whether a category is expressed symmetrically or asymmetrically would have an effect on its textual frequency; the frequency criterion is not about the structure of language and is therefore irrelevant here (its role in explaining markedness patterns will be addressed below). Symmetric and asymmetric structures do not behave differently as to overt coding, either – in both types, the marked category is generally overtly coded; it may, however, be noted that in cases where neither category is overtly expressed (e.g., in the Dravidian negatives mentioned in note 11), there has to be some asymmetry in the structures for the distinction between the categories to be visible and not merely inferable from the context. The symmetry-asymmetry distinction is highly relevant to the behavioural potential criteria. As seen above, paradigmatic asymmetry is usually about neutralization of grammatical categories, and thus indeed about the lower paradigmatic potential of the marked category. The concept of paradigmatic asymmetry is independent of the concept of markedness, and occasionally paradigmatic asymmetry conflicting with markedness relations, i.e., more distinctions made in the marked than in the unmarked category, can also be found. Handling such rare cases in terms of paradigmatic asymmetry is not a problem. Distributional potential may also be analysed in terms of paradigmatic asymmetry. When the marked category is restricted as to the contexts in which it can occur, we are dealing with paradigmatic asymmetry between the different categories that define these contexts. In Finnish, (standard) negation cannot occur in non-finite clauses and is thus restricted in its distributional potential vis-à-vis affirmation; if we take the point of view of the different clause types, we may say that there is paradigmatic asymmetry between finite and non-finite clauses as the distinction between negatives and affirmatives cannot be made in non-finites. Thus, the marked category is, on the one hand, the one in connection with which (some) grammatical categories tend to be neutralized when it shows paradigmatic asymmetry vis-à-vis its unmarked counterpart, and on the

other, the one that tends to be excluded in connection with marked members of other category pairs showing paradigmatic asymmetry. Often such co-occurrence restrictions may be seen as paradigmatic asymmetry from two different points of view – if negation and, say, imperfective aspect cannot co-occur in a given language, there is paradigmatic asymmetry between affirmation and negation (imperfective aspect being blocked in negatives) and between perfective and imperfective aspect (negation being excluded in imperfectives); but as the dependency hierarchies proposed by Aikhenvald and Dixon (1998) show, the choice of the perspectives from which such paradigmatic asymmetries are viewed is not indifferent.

The concept of typological markedness does not explain the correlation between the different phenomena that it brings together, but merely labels it; markedness is itself a relation that needs to be explained. Haspelmath (2006: 48–49, 62) suggests that the term typological markedness could be dispensed with because, according to him, frequency accounts for the correlation between the criteria. For overt coding, frequency provides a plausible motivation, but as regards behavioural potential, the model of explanation proposed in this chapter offers some challenges to this view. I have argued that structural asymmetry – including paradigmatic asymmetry restricting behavioural potential – may be explained by language-external analogy to functional asymmetry between the unmarked and marked categories. Assuming that the proposed model is indeed valid for explaining the phenomena, we must conclude that frequency alone cannot explain the phenomena subsumed under typological markedness, and this contradicts Haspelmath's arguments for abandoning the notion. It is easier to see frequency as motivating restricted behavioural potential in cases where extra distinctions are made in connection with unmarked categories – extra distinctions can be argued to be easier to remember with frequent categories – but when productive distinctions otherwise commonly observed in a language are restricted in connection with a marked category, frequency is much less likely to be the motivating factor; in fact, it might even be an extra burden for language users to remember this special restriction with a particular category. For the role of frequency as a partial explanation for paradigmatic asymmetry, see Miestamo (2005: 205–206, 216).

Comparing the cross-linguistic frequency of paradigmatic neutralization in negatives and interrogatives may provide a concrete test for the role of frequency vs. language-external analogy in explaining the phenomenon. As pointed out above, and discussed at length in Miestamo (2005: 197–200, 211–212), neutralization of grammatical distinctions in negatives can be explained in terms of language-external analogy by the special discourse

context of negation. A similar motivation is not known to exist for neutralization in interrogatives, and we would thus expect neutralization to be less common in interrogatives than negatives. In other words, negatives, where both frequency and a motivation based on language-external analogy are operational, should show more neutralization than interrogatives where frequency alone is responsible for the lower behavioural potential. This needs to be studied with a large sample, but the initial results presented in Section 4 above suggest that this is indeed the case; Schmid's (1980) results also point in this direction. Naturally, additional motivations based on language-external analogy will then have to be proposed for strong restrictions on behavioural potential found in any other functional domains.

In any case, explaining the behaviour of linguistic categories in terms of frequency still leaves open the question why one category is more frequent than the other. Haspelmath (2006: 45) sees frequencies as given and their explanations as outside the interests of linguistics. However, many functional factors that could be used in explaining frequencies can be used in explaining other linguistic phenomena as well, and seeing these as irrelevant as explanations for frequency, but as relevant as explanations for some other phenomena is problematic. The discourse context of negatives explaining paradigmatic asymmetries is a case in point; it may also be seen as an important factor behind the lower textual frequency of negatives. If we do not go beyond frequency in our explanations, we may miss some necessary ingredients for a deeper understanding of phenomena.

A practical problem in simply talking about frequency is that it does not say anything about the conceptual relation between the categories. Inherent in the concept of markedness is that the unmarked and marked categories form a conceptual opposition or are at least related in functional (semantic or pragmatic) terms. If we simply talk about frequency, we always have to add a qualifier like "the more frequent one of the semantically related/opposed categories". Contrary to Haspelmath (2006: 62), I think typological markedness is a useful metagrammatical concept – labelling a phenomenon, in this case the correlation between the criteria of typological markedness, with its (proposed) explanation will lead to confusing the phenomenon with its (proposed) explanation.

6. Concluding remarks

I have argued for a model of describing linguistic structures in terms of constructional and paradigmatic symmetry and asymmetry between related

categories, and explaining them in terms of language-internal and language-external analogy. I have also provided a theoretical discussion of the relationship between (a)symmetry and typological markedness. We still need to return to the question how generally applicable the principles are: what kinds of functional domains can be described and explained in these terms? As discussed above, the principles lend themselves best to domains where clear markedness patterns are found, e.g., negation (vs. affirmation) and interrogation (vs. declaration). As to imperatives, their typological markedness vis-à-vis declaratives is not as clear according to the overt coding criterion – (second singular) imperatives are often minimally marked – but the other criteria do point towards the markedness of imperatives; in any case, there is a (universally expressable) functional opposition between declaratives and imperatives, and this is enough as a basis for examining the relationship between these categories in terms of (a)symmetry. It is also easy to imagine that the principles would yield interesting results when looking at for example subordinate (vs. main) clauses. It is less obvious how they could be used in studying domains such as tense or aspect, where it is far less clear which categories are typologically unmarked, i.e., which tense or aspect category, if any, could be taken as the reference point against which the other categories in the domain are compared. Still, even with such domains, the principles of classification and explanation may increase our understanding of cross-linguistic variation; the notion of paradigmatic (a)symmetry can be used as a tool to describe and explain co-occurrence restrictions in tense-aspect systems, for example. It may also be noted that the functional domains approached using the distinction need not be verbal or clausal; in principle, the marking of a function such as definiteness in noun phrases could be examined in terms of whether and how the structure of noun phrases marked for definiteness show constructional or paradigmatic (a)symmetry vis-à-vis their non-definite-marked counterparts, and then look for functional explanations for the different types of definiteness marking in terms of language-internal and language-external analogy.

Both (a)symmetry and markedness are about relations between categories, and they come together in – depending on perspective – paradigmatic asymmetry or behavioural potential. When studying the relations between categories, it makes sense to look at them from both viewpoints and pay attention to markedness and (a)symmetry. Just as paradigmatic asymmetry can be seen as one component of typological markedness, restricted behavioural potential may be seen in the larger context of constructional and paradigmatic (a)symmetry. The symmetry-asymmetry model provides an

effective descriptive tool, with clear definitions for constructional and paradigmatic (a)symmetry – a descriptive tool that is also theoretically motivated since it allows explanation in terms of language-internal and language-external analogy.

Notes

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2. All examples for which no source has been specified are based on the author's knowledge of the language in question. Abbreviations used in the glosses: 1 first person, 2 second person, 3 third person, ACC accusative, ACT actual, AFF affirmative, ALL allative, ANT anterior, ART article, CNG connegative, F feminine, FOC focus, FUT future, IMPF imperfective, INCL inclusive, INF infinitive, IRR irrealis, LCT locutor, M masculine, N neuter, NEG negative, NLCT nonlocutor, NMLZ nominalization, NPST nonpast, OBJ object, PERF perfect, PL plural, POSS possessive, POT potential, PRES present, PST past, Q interrogative, SBRD subordinate, SG singular, SUBJ subject, TOP topic.
3. In this context, neutralization means simply loss of distinctions, not contextual neutralization in the sense of Greenberg (1966: 28–29).
4. The presence of the marker(s) of category C, would, strictly speaking, also be an asymmetry between the structural encoding of the categories. Here, asymmetry means differences in addition to the simple marking of category C.
5. Itkonen (2001) uses language-external analogy to explain cases where fewer grammatical distinctions are made in non-factual modalities than in factual ones and language-internal analogy for cases where the same distinctions are made in both. My model of explanation takes these principles as general motivations for constructional and paradigmatic symmetry and asymmetry.
6. Some verbs, e.g., 'stay', may be seen as exceptions, but the most prototypical and frequent cases are the ones that matter for how grammar is shaped.
7. Humans prefer symmetry for aesthetic reasons as well. The two preferences for symmetry, aesthetics and ease of processing/storage, come nicely together in (traditional) poetry where similarities between verses (metre, rhyme, alliteration) serve both functions.
8. As the anonymous referee pointed out, iconicity may also be ultimately explained, at least partly, by economy of processing/storage – analogies between function and form certainly make processing and storage easier.
9. Miestamo and van der Auwera (2007) have applied the principles to the negation of imperatives, using a 30-language pilot sample.

10. Earlier typological observations about polar interrogatives (Ultan 1978; Sadock and Zwicky 1985; Siemund 2001; Dryer 2005) have identified the following types of interrogative markers: intonation, interrogative particles, disjunction (A-not-A), order of constituents, and verbal inflection. The existence of interrogative auxiliaries is certainly not news to linguists familiar with languages like Halkomelem and Awa Pit, but it is worth noting that earlier typological studies have not mentioned this type of interrogative marker. It seems probable, though, that this type is over-represented in the pilot sample.
11. There are some cases where overt negative markers are not found, e.g., in some South-Dravidian languages where negatives differ from affirmatives only by the absence of tense marking in negatives (Miestamo 2005: 121, 228); these do not, however, constitute counterevidence for the markedness of negation according to the overt coding criterion, since the unmarked category is not overtly coded either – it is tense and not affirmation that receives overt coding.

References

Aikhenvald, Alexandra, and Robert M. W. Dixon
1998 Dependencies between grammatical systems. *Language* 74: 56–80.

Asher, Ronald E., and T. C. Kumari
1997 *Malayalam*. (Descriptive Grammars.) London: Routledge.

Blackings, Mairi, and Nigel Fabb
2003 *A Grammar of Ma'di*. (Mouton Grammar Library 32.) Berlin/New York: Mouton de Gruyter.

Bowden, John
1997 Taba (Makian Dalam): Description of an Austronesian Language from Eastern Indonesia. Ph. D. diss., University of Melbourne.

Capell, Arthur, and H. E. Hinch
1970 *Maung Grammar*. (Janua Linguarum, Series Practica 98.) The Hague: Mouton.

Contini-Morava, Ellen
1989 *Discourse Pragmatics and Semantic Categorization: The Case of Negation and Tense-Aspect with Special Reference to Swahili*. (Discourse Perspectives on Grammar 1.) Berlin/New York: Mouton de Gruyter.

Cornyn, William
1944 *Outline of Burmese Grammar*. (Language Dissertation 38. Supplement to Language 20 [4].) Baltimore: Linguistic Society of America.

Croft, William
2003 *Typology and Universals*. Second edition. Cambridge: Cambridge University Press.

Curnow, Timothy Jowan
1997 A grammar of Awa Pit (Cuaiquer): An indigenous language of South-Western Colombia. Ph.D. diss., Australian National University.
Dryer, Matthew S.
2005 Polar questions. In *World Atlas of Language Structures*, Martin Haspelmath, Matthew Dryer, David Gil, and Bernard Comrie (eds.), 470–473. Oxford: Oxford University Press.
Givón, Talmy
1978 Negation in language: Pragmatics, function, ontology. In *Syntax and Semantics. Vol. 9. Pragmatics*, Peter Cole (ed.), 69–112. New York: Academic Press.
1981 Typology and functional domains. *Studies in Language* 5: 163–193.
2001 *Syntax: An Introduction*. Vol. I. Amsterdam: Benjamins.
Greenberg, Joseph
1966 *Language Universals, with Special Reference to Feature Hierarchies*. The Hague: Mouton & Co.
Haiman, John
1985 *Natural Syntax: Iconicity and Erosion*. (Cambridge Studies in Linguistics 44.) Cambridge: Cambridge University Press.
Hakulinen, Auli, Fred Karlsson, and Maria Vilkuna
1980 *Suomen tekstilauseiden piirteitä: kvantitatiivinen tutkimus* [Properties of sentences in Finnish texts: A quantitative study]. (Publications of the Department of General Linguistics 6.) Helsinki: University of Helsinki.
Haspelmath, Martin
2006 Against markedness (and what to replace it with). *Journal of Linguistics* 42: 25–70.
Hawkins, John A.
2004 *Efficiency and Complexity in Grammars*. Oxford: Oxford University Press.
Horn, Laurence R.
1989 *A Natural History of Negation*. Chicago: University of Chicago Press.
Itkonen, Esa
1994 Iconicity, analogy and universal grammar. *Journal of Pragmatics* 22: 37–53.
2001 *Maailman kielten erilaisuus ja samuus* [The unity and diversity of the world's languages]. Second edition, revised and expanded. (Yleisen kielitieteen julkaisuja 4.) Turku: Turun yliopisto.
Kayne, Richard S.
1994 *The Antisymmetry of Syntax*. (Linguistic Inquiry Monographs 25.) Cambridge, MA: MIT Press.
Miestamo, Matti
2000 Towards a typology of standard negation. *Nordic Journal of Linguistics* 23: 65–88.

2003 Clausal negation: A typological study. Ph.D. diss., University of Helsinki.

2004 Asymmetry within and across functional domains with special reference to yes-no questions, commands, negation and tense-aspect-mood. Presentation at the Syntax of the World's Languages (SWL 1) conference, Leipzig, August 6, 2004. [handout available at <http://email.eva.mpg.de/~cschmidt/SWL1/handouts/Miestamo.pdf>]

2005 *Standard Negation: The Negation of Declarative Verbal Main Clauses in a Typological Perspective*. (Empirical Approaches to Language Typology 31.) Berlin/New York: Mouton de Gruyter.

Miestamo, Matti, and Johan van der Auwera

2007 Negative declaratives and negative imperatives: Similarities and differences. In *Linguistics Festival, May 2006 Bremen*, Andreas Ammann (ed.), 59–77. (Diversitas Linguarum 14.) Bochum: Brockmeyer.

Sadock, Jerrold M., and Arnold M. Zwicky

1985 Speech-act distinctions in syntax. In *Language Typology and Syntactic Description, Volume I, Clause Structure*, Timothy Shopen (ed.), 155–196. Cambridge: Cambridge University Press.

Schmid, Maureen

1980 Cooccurrence restrictions in negative, interrogative, and conditional clauses: A cross-linguistic study. Ph. D. diss., SUNY Buffalo.

Siemund, Peter

2001 Interrogative constructions. In *Language Typology and Language Universals, An International Handbook*, Volume 2, Martin Haspelmath, Ekkehard König, Wulf Oesterreicher, and Wolfgang Raible (eds.), 1010–1028. (HSK 20.) Berlin: Walter de Gruyter.

Stassen, Leon

1985 *Comparison and Universal Grammar*. Oxford: Blackwell.

Terrill, Angela

2003 *A Grammar of Lavukaleve*. (Mouton Grammar Library 30.) Berlin/New York: Mouton de Gruyter.

Ultan, Russell

1978 Some general characteristics of interrogative systems. In *Universals of Human Language*, Volume 4, Joseph Greenberg (ed.), 211–248. Stanford: Stanford University Press.

van der Auwera, Johan, and Ludo Lejeune

2005 The prohibitive. In *The World Atlas of Language Structures*, Martin Haspelmath, Matthew Dryer, David Gil, and Bernard Comrie (eds.), 290–293. Oxford: Oxford University Press.

The verbness markers of Mosetén from a typological perspective

Jeanette Sakel

1. Introduction

The aim of the present paper is to discuss a new case of a particular type of complex predicates.[1] These predicates are found in the language Mosetén, a Mosetenan language spoken in the foothills of the Bolivian Andes. Drawing on the literature of complex predicates, I will show that the structures in Mosetén are formally very similar to those employed in some Australian languages, which are often referred to as *coverb-verb* constructions (e.g., Schultze-Berndt 2000). This similarity could be explained by the origins of the constructions in ideophones on the one hand, and high-frequency verbs on the other, as argued for some Australian languages; this is a likely scenario for Mosetén as well. I will conclude that coverb-verb constructions are not just an areal feature in certain Australian languages, but a specific type that appears in different parts of the world.

The term *complex predicate* is used in the literature for a wealth of different constructions. Alsina, Bresnan and Sells (1997: 1) summarize these as "predicates which are multi-headed; they are composed of more than one grammatical element (either morphemes or words), each of which contributes part of the information ordinarily associated with a head". Many kinds of constructions are subcategories to complex predicates, such as serial verbs, auxiliary-verb combinations, and light verb constructions. Indeed, at this level we find an enormous range of terminology describing often very similar constructions (cf. Crowley 2002 and Butt 1997 for discussion). Often, a sub-category denotes a type of complex predicates found in one particular part of the world, independent of its relations to other types. In this way, Papuan languages have so-called adjunct-verb constructions (Foley 1986), which combine a verb from a closed class with a noun or nominal adjunct. These complex predicates are in many ways similar to light-verb constructions in South Asian languages, which also combine a closed-class verb with a non-inflecting element, usually a semantically restricted noun (Masica 1991; Butt 1997). Other complex predicates com-

bine two verbs, such as auxiliary constructions in Indo-European languages, which join a closed-class verb with a verb from an open class (Agard 1977; Warner 1993). The auxiliary verb usually has grammatical functions, such as tense. Serial verb constructions are common in languages from different parts of the world. They combine verbs within one clause, all of which have the same subject and express the same tense/aspect relations (Sebba 1987). The verbs in this construction usually belong to an open class, and the meaning of the combination is often slightly different from being purely compositional. Coverb-verb constructions in Australian languages are another type of complex predicates (Silverstein 1986; Blake 1987; Heath 1984; Schultze-Berndt 2000; McGregor 2002). These constructions appear in many languages of Northern and Central Australia, and have been argued to be an areal feature (Capell 1976; Dixon 2001). Coverb-verb constructions generally consist of a non-verbal element and a verbal element. The non-verbal element can be a "coverb" or "unmarked stem", but also nouns, adjectives, or loanwords from other languages can appear in its place. The finite verbal elements usually belong to a closed class and can act both as finite verbal elements within complex predicates, as well as appearing on their own as simple verbs.

I will first introduce a number of characteristics of Mosetén, and then outline the system of verbness markers in this language. I will then look at formal resemblances between verbness markers and markers of other structures, which gives us indications as to how this system has developed. Finally, I will give a typological perspective to my analysis of the complex predicate construction of Mosetén.

2. Mosetén

Mosetén belongs to the small language family Mosetenan with approximately 5000 speakers, consisting of Mosetén of Covendo (600–800 speakers), Mosetén of Santa Ana (150–200 speakers), and Chimane (at least 4000 speakers). The Mosetén variants are spoken in the Alto Beni valley of the foothills of the Bolivian Andes, and the Chimane language in the adjoining Amazonian lowland area around the city of San Borja. Mosetenan has not yet been convincingly proved to be related to any other South American language family (Sakel 2004: 2–3). The present survey is based on the dialect of Mosetén spoken in Covendo.[2]

Mosetén has five oral and five corresponding nasal vowels, the latter indicated by two dots on the vowel. The oral and nasal vowels alter in a system of nasal harmony (cf. Sakel 2004: 40). The degree of synthesis is rather high, especially in verbs. Being mainly agglutinative, Mosetén nonetheless has a number of fusional characteristics; for example some derivational affixes are fused with the verbal cross-reference forms. There is frequent morphophonological variation. While the nominal morphology is rather simple, the verbal morphology is complex, with obligatory cross-referencing of person, gender and number of subject and/or object. There is a rich verbal derivational system, including aspectual markers, associated motion markers, voice markers, as well as verbal markers meaning 'strongly' and 'again'. The basic word order is SV in intransitive and AVO in transitive clauses. Predicate clauses are expressed by juxtaposition of subject and predicate without a copular verb.

One of the striking facts about Mosetén is that this language only has a small number of "real" (henceforth *simple*) verbs. One such simple verb is *yi-* 'say' (1):[3]

(1) *Yäe* ***yi.***
1SG[M] say[1]M.SG
'I say (something).'

Most actions and events expressed by lexical verbs in other languages are complex predicates in Mosetén. These complex predicates always consist of a verbness marker (henceforth *VM*, such as *-yi-* 'DO/BE'[4]) and a non-finite element (*sak-* 'leave'):

(2) *Yäe* *sak-**yi.***
1SG[M] leave-DO/BE[3]M.SG
'I leave.'

The first element of the complex predicate is the unmarked stem *sak-* 'leave'. Also other non-verbal elements such as nouns, adjectives, the adverbial demonstrative *me'* 'so' and loanwords can appear in combination with a VM, forming a complex predicate.

It is not a coincidence that the simple verb *yi-* 'say' (1) and the VM *-yi-* 'DO/BE' (2), have the same form. Most VMs match simple verbs; in some cases both forms are very similar (e.g., *-yi-*), whereas in other cases it is difficult to establish correspondences. Some VMs and simple verbs furthermore appear similar in form to markers of voice, associated motion and

aspect. The semantics of the VMs often resemble those of the corresponding simple verbs, though expressing more general meanings, cf. 'DO/BE' (2) and 'say' (1). This points at a grammaticalization from simple verbs to VMs. In this process, the meanings of the verbal elements became generalized, while developing grammatical functions of a classificatory kind. One

Table 1. Verbness markers and related markers:

Form of VMs	Function of VMs	Related elements
-i-	Mostly intransitive	[*-i-*, loan integration]
'BE/HAVE'	Often low sbj. control	
-yi-	Intr. and trans.	[*-yi-*, loan integration]
'DO/BE'	Stative and active	Applicative *-yi-*
	General meaning	Simple verb *yi-* 'say, do' (intr./tr.)
-tyi-	Transitive	Applicative *-tyi-*
'PUT'	Dynamic	Simple verb *tyi-* 'give, put' (tr.)
	High sbj. control	
-jo-	Intransitive	Aspect *-jo-* 'inceptive'
'BECOME'	Mostly stative	Associated motion *-kho-* 'movement
	Involuntary, no sbj. control	away from the deictic centre, doing the action on the way'
		Simple verb *jo-* 'become' (intr.)
-ki-	Intransitive	Antipassive *-ki-*
'BE'	Stative and dynamic	Middle *-ki-*
		Associated motion *-ki-* 'performing an action after arriving at a place away from the deictic centre'
		Simple verb *ka-* 'bring there' (tr.)?
-ti-	Intransitive	Antipassive *-ti-*
'DO'	Dynamic	Reflexive/reciprocal *-ti-*
	Some sbj. control	Associated motion *-ti-*/*-sh-* 'performing an action after arriving at the deictic centre'
		Simple verb *ti-* 'bring here' (tr.)?
-wi-	Intr. and trans.	
'SEE/HEAR'	Experience or creation of visual or audio stimulus	
	Unproductive	
-chhi-	Intr. and trans.	Associated motion *-chhi-* 'movement to
'MOVE/HAVE'	Unproductive	the deictic centre, doing the action on the way'
		Simple verb *chhi-* 'grab'(tr.)?

of the roles of VMs is to contribute to the classification of the overall actions/events, among others with respect to valency and control attributed to the arguments.

3. Mosetén verbness markers

There are eight VMs in Mosetén. Table 1 gives their forms and functions, as well as related elements, such as markers of voice, aspect, associated motion and integration of loanwords from Spanish.[5]

The functional differences between the VMs listed above can be seen when comparing the examples in (3). In each example, the unmarked stem *wai'-* 'boil' is connected to a different VM:[6]

(3) a. *Yäe* *wai'-**ye**-'* *öjñi".*
1SG[M] boil-DO/BE-[1M.SG]>3F[SG] water[F]
'I boil the water.'

b. *Mö'* *öjñi"* *wai'-**tye**-'.*
3F.SG water[F] boil-PUT-[1M.SG]>3F[SG]
'I put the water to boil.'

c. *Mö'* *öjñi"* *wai'-**ki**-'.*
3F.SG water[F] boil-BE-[3]F[SG]
'The water boils.'

d. *Mö'* *wej* *wai'-**jo**-'* *arosh-khan.*
3F.SG seed[F] boil-BECOME-[3]F[SG] rice.LOAN[F]-IN
'The seed was (accidentally) boiled in the rice.'

These parallel examples show how VMs are involved in the categorisation of the event or action expressed by the complex predicate. While the basic meaning of the non-finite element is 'boil', the overall meaning of the entire complex predicate strongly depends on the VM it appears with. The markers *-yi-* (3a) and *-tyi-* (3b) form dynamic complex predicates that differ in the amount of control the subject participant has over the action in terms of causation and volition; *-tyi-* (3b) focuses on the control of the subject/agent and the causation of the event, while *-yi-* denotes a general action, without such a focus. The VM *-ki-* (3c) focuses on a state, in this case the state of the water, while *-jo-* (3d) marks an accidental action, namely the seed falling into the water and being boiled accidentally. The two last examples are both intransitive and do not give any indication of an agent. The subjects of these clauses have little control over the action.

Another frequent VM is the unproductive *-i-*, appearing with intransitive verbs:

(4) *Mi"ïn* *chhome'* *näij-ï-'.*
2PL[F] also see-BE/HAVE-[3]F[SG]
'You (plural) are also seen.'

The marker *-ti-* 'DO intransitive, dynamic, control' is also unproductive and appears with dynamic actions (5).

(5) *Moch-ti.* (*moch* 'far', adverb)
far-DO[3]M[SG]
'He goes far (away).'

The marker *-wi-* 'SEE/HEAR' appears with ten different elements, expressing the creation or perception of visual or audio stimuli (6).[7]

(6) *Boj-**wi**-'.*
play.flute-SEE/HEAR-[3]F[SG]
'She played the flute.'

The marker *-chhi-* is even less frequent, as it only appears in two combinations, cf. (7a) and (7b):

(7) a. *Wën-**chhi**.*
come-MOVE/HAVE.[3]M[SG]
'He comes (here).'
b. *Mi* *tyäkä'* *me'-**chhi**-'*
2[F]SG always so-MOVE/HAVE-[2F.SG]>3F.SG
poroma-min-si' *pheyakdye'.*
old-ASSOCIATIVE-L[8].F story[F]
'You always have (i.e., know) old stories.'

VMs can appear with unmarked stems (as in 3 above), as well as with adjectives and adverbs (cf. example 5). Nouns and the adverbial demonstrative *me'* 'so' (cf. example 7b) can appear in the position of the nonfinite element. The examples in (8) show the adjective *daer* 'big' in combination with VMs. In the same way as with unmarked stems discussed above, the choice of VM results in different meanings:

(8) a. *Mö'* *näsh* ***daer-i-'*** *Rapash-khan.*
3F.SG FOC big-BE/HAVE-[3]F[SG] La Paz-in
'She grew up in La Paz.'
b. *Daer-yi.*
big-DO/BE[3]M[SG]
'He has made himself big.' (by stretching, etc.)
c. *Jäen'-dyash-ra'=ki* *mö'* *ji'-**daer-te**-ra'?*[9]
how-Q-IRR=but 3F.SG CAUS-big-PUT[3F.SG]>3M.SG-IRR
'And how might she have made him grow up?'

In (8a), the subject has no control over the involuntary action of growing up, marked by the VM *-i-* 'BE/HAVE'. In (8b), the subject makes an effort and affects the action, which is marked by *-yi-* 'DO/BE'. Example (8c) expresses the 'making someone else grow up'; i.e., the causation of the event. In this case, the marker *-tyi-* 'PUT' is used.

I base my distinction between adjectives (such as *daer-* 'big') and unmarked stems (such as *sak-* 'leave' and *wai'-* 'boil') on their distribution: adjectives freely appear on their own, as well as in modifying position in the noun phrase. Unmarked stems generally occur together with a VM, forming a complex predicate. In isolated cases, they can appear on their own as ideophones. They are never modifiers in a noun phrase.

Other elements that can appear in the first position of complex predicates are loanwords. These can be integrated into the verbal system of Mosetén by appearing with the VM *-yi-* 'DO/BE' (9a) or, in very few cases, with the VM *-i-* 'BE/HAVE' (9b) (cf. Sakel 2004: 237).

(9) a. *Pagar-yi-'.*
pay.LOAN-DO/BE-3F[SG]
'She pays.' [from Spanish *pagar* 'pay']
b. *Dewe-i-'.*
owe.LOAN-BE/HAVE-3F[SG]
'She owes.' [from Spanish *deber* 'owe']

Summarizing, Mosetén VMs contribute to the categorization of events and actions expressed by the complex predicate. They indicate the overall degree of control attributed to the subject participant and determine the valency of the complex predicate. Still, the overall function of the complex predicate also depends on the underlying semantic participants of the nonfinite element. The latter include unmarked stems, loanwords, as well as different parts of speech such as adjectives.

3.1. Frequency, productivity and interplay of elements

The VMs in Mosetén vary significantly in frequency and productivity. In this way, the VM *-yi-* is highly productive and can be added to any non-finite element, while the marker *-chhi-* only occurs in two combinations. Consider Table 2, indicating the text frequency of types of predicates in Mosetén, and the non-finite elements that complex predicates occur with. It is based on a sample of 500 clauses taken from a continuous conversation.[10] The remaining clauses were either copular clauses containing no verb (143 clauses) or they contained a simple verb (65 clauses).

Table 2. Token frequencies of VMs in 500 clauses of a conversation

	Unmarked stem/VM	Noun/VM	Adjective/VM	*me'*/VM	Loan/VM
-i- 'BE/HAVE'	83	4	4	1	5
-yi- 'DO/BE'	46	4	0	5	27
-tyi- 'PUT'	23	0	6	0	0
-ki- 'BE'	37	0	0	2	0
-ti- 'DO'	22	0	0	1	0
-jo- 'BECOME'	6	0	0	1	0
-chhi- 'MOVE/HAVE'	5	0	0	0	0
-wi- 'SEE/HEAR'	10	0	0	0	0
total	232	8	10	10	32

VMs turn out to be different in their text frequency. This has little to do with their productivity, though. For example, the marker *-i-* is more frequent in the count than *-yi-*, but only the latter is productive. Albeit frequent, *-i-* can not be productively used to form complex predicates; i.e., all complex predicates it appears with are lexicalized, including the loanwords. In fact, most VMs are unproductive and appear in a fixed number of complex predicates. Some VMs only occur with a handful of non-finite elements. For example, the five occurrences of *-chhi-* in Table 2 are all in the combination *wën-chhi-* 'come back here'.

Table 2 also gives an indication of which types of non-finite elements the different VMs combine with. They all occur with unmarked stems; this makes up almost half of the clauses of the count (232 cases), while complex predicates combining a noun, adjective, adverbial demonstrative or loanword with a VM only appear in 60 cases.

Sometimes, the overall meaning of a complex predicate is significantly different from another complex predicate using the same VM. This has to

do with the interplay of the non-finite element and the VM within the complex predicate. VMs often have broad functions, which combine with the meaning of the non-finite element they appear with. This determines the overall meaning of the complex predicate. For example, *-yi-* 'DO/BE' has a number of different functions and can both express dynamic actions and stative events. In combination with *aka'* 'house' it has a dynamic meaning (10a), while in combination with *jaem'* 'good' the meaning is stative (10b).

(10) a. *Aka'-yi-'.*
house[F]-DO/BE-[3]F[SG]
'She builds a house'
b. *Jaem'-yi-'.*
good-DO/BE-[3]F[SG]
'She is good'

This difference could have to do with the typical actions or events associated with 'house' and 'good'. In the first case, 'DOing' a house, i.e. 'building a house' is more frequently the case than 'BEing' a house. In the case of 'good', 'BEing' good seems to be more salient than 'DOing' good. To achieve the latter meaning, one could use the VM *-tyi-* 'PUT'.[11] This shows that not just the classificatory function of the VM plays a role in determining the outcome of the overall event/action, but that the non-finite element plays a role as well.

Some of the complex predicates can be consider invariable lexical entities, which can make it difficult to clearly establish the exact meaning of their VM. This is often the case when the VM is unproductive. For example, the marker *-chhi-* 'MOVE/HAVE' only appears in two complex predicates, with two – as it appears – different meanings.

3.2. The "general" VM *-yi-*

Let us for a moment explore some peculiarities in connection with the frequent VM *-yi-*. It is the most productive VM and can be added to any non-finite element to turn it into a complex predicate. As can be seen in examples (10a) and (10b) above, the meaning of this marker is very general, expressing different types of actions and events.

In the examples given so far, the VMs are connected morphologically with the non-finite element to form a one-word complex predicate. Suffixes follow the entire complex predicate and prefixes precede it. Cf. the

causative prefix *ji'-* preceding the complex predicate *bae'-i-* 'live', which consists of the unmarked stem *bae'-* 'live' and the VM *-i-*[12] 'BE/HAVE' (11):

(11) *Mi'* ***ji'-bae'-a****-ksi* *mi'-in*
3M.SG CAUS-live-BE/HAVE-[3M.SG]>3[M]PL 3M-PL
jovenes-in.
youth[M]-PL
'He makes the youth live (up there).'

Complex predicates formed by all VMs behave in this way, with the exception of a number of constructions involving the marker *-yi-*. In these cases, prefixes appear directly before the *-yi-*, rather than before the entire complex predicate (12) (cf. Sakel 2004: 228):

(12) *Mi'* *tyaph-ye-'* *khäei'-si'* *phen'*
3M.SG grab-DO/BE-3F[SG] LOGOPHORIC-L.F woman[F]
mö'=ki *kawin* ***faraj-ji'-yi****-ti-'.*
3F.SG=but fast leave-CAUS-PUT-RE-3F[SG]
'He grabbed his (own) wife, but she freed herself quickly.'

In (12) the causative prefix *ji'-* appears between the unmarked stem *faraj-* 'leave' and the VM *-yi-*.

In yet other cases containing *-yi-*, prefixes can only be added to the entire complex predicate (13):

(13) a. *Ji'-****chhae-yi****-ti-'.*
CAUS-know-DO/BE-RE-[3]F[SG]
'She studies.'
b. ****Chhae-ji'-yi****-ti-'.*
know-CAUS-DO/BE-RE-[3]F[SG]
'She studies.'

An explanation for this can be the degree to which the construction is seen as one lexical entity. This is likely to happen when a complex predicate is very frequent, such as 'study' above. This results in prefixes being added to the entire complex predicate, rather than the VM. When the speaker processes the complex predicate as a construction that is productively formed by two elements, on the other hand, the prefix is more likely to appear before the VM. In any case, *-yi-* 'DO/BE' has a special status

among the VMs. One could ask if *yi-* is a separate simple verb altogether; i.e., that (12) above consists of a non-finite clause with the unmarked stem *faraj* 'leave', followed by a finite clause with the simple verb *yi-* 'say'. The reason for me not to take this viewpoint has to do with the overall meaning of the clause: the interplay of both meanings in the combination of unmarked stem and VM is different from the occurrence of both elements on their own. If the complex predicate in (12) consisted of two separate predicates (one finite, one non-finite), the meaning would be something along the lines of 'she left, she made herself say' rather than literally 'she made herself leave'; i.e., 'she freed herself'.[13]

4. Formal resemblances between VMs and other elements

Most VMs formally resemble other verbal elements in Mosetén. These elements can either be simple verbs (cf. examples 1 and 2 above), or derivational verbal markers with functions such as voice, aspect and associated motion (cf. Table 1). In some cases also the functions are comparable, which would suggest that these elements have grammaticalized from the same sources. In this way, most of the eight simple verbs in Mosetén correspond to the eight VMs (cf. Table 3): *yi-* 'say' (vs. *-yi-* 'DO/BE'), *tyi-* 'give' (vs. *-tyi-* 'PUT'), *jo-* 'become' (vs. *-jo-* 'BECOME'), *chhi-* 'grab' (vs. *-chhi-* 'MOVE/HAVE'), *ka-* 'bring there' (vs. *-ki-*, *-k-*, *-ka-* 'BE'), *ti-* 'bring here' (vs. *-ti-, -sh-* 'DO'), as well as the two simple verbs *ban-* 'go' and *ji-* 'pass' that are not parallel to a VM.

Table 3. Verbal elements of Mosetén: simple verbs and VMs

Simple verb		VM	
yi-	'say'	*-yi-*	'DO/BE'
tyi-	'give, put'	*-tyi-*	'PUT'
jo-	'become'	*-jo-*	'BECOME'
[*ka-*]	['bring there']	*-ki-* (*-ka-, -k-*)	'BE'
[*ti-*]	['bring here']	*-ti-* (*-sh-*)	'DO'
[*chhi-*]	['grab']	*-chhi-*	'MOVE/HAVE'
ji-	'pass'	-	
ban-	'go'	-	
-		*-i-*	'BE/HAVE'
-		*-wi-*	'SEE/HEAR'
[*ka-*]	['bring there']	-	
[*ti-*]	['bring here']	-	
[*chhi-*]	['grab']	-	

Every finite verb, complex predicate or other, in Mosetén is, or appears with one of these eight VMs or eight monosyllabic simple verbs. The VMs and simple verbs are partly overlapping in their forms and functions, which can point at VMs having developed from simple verbs. Cases where a connection between VM and simple verb is not entirely clear are listed twice in Table 3, with square brackets indicating that they are possibly related to one of the other markers. Allomorphs are given in round brackets. In this way, there are altogether at least ten etymologically different verbal elements in Mosetén.

Entirely clear correspondences in the functions of VMs and simple verbs only exist with *-tyi-* 'PUT' and *-jo-* 'BECOME'. For example, the simple verb *tyi-* 'give, put', is parallel to a VM *-tyi-* 'PUT'. These two elements are furthermore parallel to the applicative *-tyi-*, which is used to add a direct object to an intransitive clause or turn a secondary object (often with the semantic role of a patient) into a direct object, cf. examples in (14) below.[14] All these markers appear in transitive contexts, in which the subject participant has a high degree of control and in which a transfer to a third participant takes place.

Voice functions of markers associated with VMs include applicative, antipassive, middle and reflexive/reciprocal. The VMs *-yi-* and *-tyi-* have the same forms as the applicatives *-yi-* 'for the purpose/benefit of' (14a) (cf. Sakel 2004: 319) and *-tyi-* 'action affecting another person or thing' (14b) (cf. Sakel 2004: 320).

(14) a. *Yäe-rä'* *mi-we* *karij-**tye-ya**-ksi*
1SG-IRR M-down hard-PUT-APPL-[1]M[SG]>3M.PL
nöjnöj.
tomorrow
'I will work for them tomorrow' (from *karij-tyi-* 'work')

b. *Me'* *tyaj-ke-'-in* *jike* *me'*
so meet-BE-[3M.PL]>3F.SG-PL before so
phi-ki-' *keo'tso-**tye-tye**-'*
run-BE-[3]F.SG step.on-PUT-APPL-[3M.PL]>3F.SG
o'sho'.
clothes
'Then they met her; then she ran, (but) they stepped her on the clothes.' (from *keo'tso-tyi-* 'step on something')

In this way, markers of similar forms appear within the same complex predicate, often immediately following each other (cf. *-tye-* 'PUT' and

-tye- 'APD' in 14b). Yet, the constructions they appear in are very different from one another. While the VM in combination with the non-finite element forms a complex predicate with a certain classificatory character, the applicative merely changes the status of the semantic participants and/or the valency of the predicate. Thus, the VM is a "verbalizer", forming complex predicates, while the applicative marker is a verbal derivational marker that has to be added to fully functioning "verbs"; i.e., complex predicates or simple verbs.

The VMs *-ti-* and *-ki-* are parallel to antipassive markers of the same forms. The antipassive marker *-ki-* is used to detransitivize actions, as well as in cases where the object belongs to the subject of the clause (15a) (Sakel 2004: 309); *-ti-* is used in contexts of violence, aggression or requests (15b) (Sakel 2004: 311). The marker *-ti-* is also used to mark a reflexive or reciprocal (Sakel 2004: 191), while *-ki-* can mark the middle voice (Sakel 2004: 306).

(15) a. *Yäe* *saph-**ya-ki*** *kanoa.*
1SG tie-DO/BE-ANTIP[3]M[SG] canoe.LOAN
'I tied (my own) canoe.'

b. *Aj-win* *me'-si-si'* *aj* *chhi-**ti**-'-in*
yet-PRF so-L.F-L.F yet grab-ANTIP-[3]F[SG]-PL
*jib-**i**-**ti**-in.*
eat-BE/HAVE-ANTIP-[3]F[SG]-PL
'(The monster) grabbed her like this and ate her.'

The voice markers discussed here are linked in their functions to VMs by conveying the same distinctions with respect to their valency and underlying semantic participants: the VMs *-yi-* and *-tyi-* are both used for transitive actions and the related voice markers are applicatives; i.e., markers that can increase the valency of a verb. Likewise, the de-transitivizing markers, *-ki-* 'antipassive, middle' and *-ti-* 'antipassive, reflexive and reciprocal' can only be used intransitively as VMs.[15]

The VM *-jo-* is parallel to an aspectual marker that expresses change of state and inceptive aspect. There is furthermore an associated motion marker *-(k)ho-* of roughly the same form, meaning 'movement away from the deictic centre, doing the action on the way'. These all have in common that they describe actions being carried out while moving away from a deictic centre in space or time. Compare the following examples of *-jo-* as an associated motion marker (16a), VM (16b) and aspectual marker (16c):

(16) a. *"Tëtëi" ye-j-**kho**-ja'.*
tëtëi say-MOTION-MOTION-1[F]PL.INCL
'We go away from here, saying "tetei".'
b. *Näi-**jö**-'.*
Morning-BECOME-[3]F[SG]
'It becomes morning.'
c. *Waijñe'-ye-**jo**-i majmi.*
scrape-DO/BE-INCEPTIVE-[3]M[SG] road
'(The rooster) begins to scrape the road.'

The associated motion marker in (16a) has a slightly different form from the VM and the simple verb, appearing with a /k/ in *-kho-* 'movement away from the deictic centre, doing the action on the way' as opposed to the form of the VM *-jo-* 'BECOME'. Other associated motion markers related to VMs in Mosetén are: *-ki-* 'performing an action after arriving at a place away from the deictic centre' (vs. *-ki-* 'BE'), *-ti-* 'performing an action after arriving to the deictic centre' (vs. *-ti-* 'DO') and *-chhi-* 'movement to the deictic centre, doing an action on the way' (vs. *-chhi-* 'MOVE/HAVE'). Compare examples (17-19) with those in (16) above. The forms of the associated motion markers are given in (a) and the VMs in (b):

(17) a. *Phan'-ye-**ki**-'.*
feather-DO/BE-MOTION-[3]F[SG]
'She goes there to ask for feathers.'
b. *Phi-**ki**-'.*
run-BE-[3]F[SG]
'She runs.'

(18) a. *Sob-a-j-ki-**ti**-'.*
visit-BE/HAVE-MOTION-ANTIP-MOTION-[3]F[SG]
'She comes to visit.'
b. *Jam moch-**ti**-kha'.*
NEG far-DO-1[M]PL.INCL
'We did not go further.'

(19) a. *Näij-yë-j-**chhi**-'.*
see-DO/BE-MOTION-MOTION-[3]F[SG]
'It appears (i.e., comes out to be seen).'
b. *Me'-**chhi**-'.*
so-MOVE/HAVE-[3]F[SG]
'She has something/ knows something.' (cf. example 7b)

Table 4 shows the etymological relationships I propose between simple verbs, associated motion markers and VMs.

Table 4. Comparison of motion markers, simple verbs and VMs

Simple verb	VM	Associated motion
ka- 'bring there'	*-ki-, -ka-, -k-* 'BE'	*-ki-* 'go there to do s.th.'
ti- 'bring here'	*-ti-, -sh-* 'DO'	*-ti-, -sh-* 'come here to do s.th.'
jo- 'become'	*-jo-* 'BECOME'	*-kho-* 'go there doing s.th.'
chhi- 'grab'	*-chhi-* 'MOVE/HAVE'	*-chhi-* 'come here doing s.th.'

The associated motion markers in table 4 differ formally from simple verbs. This difference is gapped by the corresponding VMs, which can have several allomorphs that correspond to the forms of both simple verbs and VMs. Most of these allomorphs only occur in a restricted number of constructions. The other verbal (derivational) markers of voice, associated motion and aspect have probably grammaticalized from VM or from an intermediate stage of simple verbs grammaticalizing into VMs, when VMs were not yet morphologically connected to their base.

5. Mosetén complex predicates from a typological perspective

Having looked at the Mosetén system in detail, I now want to come back to the question of how Mosetén complex predicates fare in a typological perspective.

The coverb-verb constructions identified for several Australian languages in many ways resemble the complex predicate constructions in Mosetén. Cf. (20) from Jaminjung, showing the simple verb *-ma* 'hit' (20a) and a complex predicate with the coverb *bag* 'break' and the finite element *-ma-* 'HIT' (20b):

(20) Jaminjung (Australian, Jaminjungan; Schultze-Berndt 2000: 4)
  a. *Gani-**ma**-m* *jurruny-ni.*
  3SG.3SG-HIT-PRS lower.arm-ERG/INSTR
  'He hits him with the hand.'
  b. *Miri* ***bag*** *burra-**ma**-nyi* *gurrubardu-ni.*
  leg break 3PL.3SG-HIT-IMPF boomerang-ERG/INSTR
  'They used to break its legs with a boomerang.' (kangaroo)

In Jaminjung, the coverb and the finite element are not single prosodic words as in Mosetén. Many other Australian languages that have this type of predicates have single words; e.g., Gooniyandi:[16]

(21) Gooniyandi (Australian, Bunuban; McGregor 1990: 200)
Gárd-binggúruni.
HIT-FUT.2PL.3PL.HIT
'You (plural) will hit them.'

Apart from Australian languages, complex predicates of a similar type also appear in other languages, such as Tsafiki, a Barbacoan language from Ecuador (Dickinson 2003). The predicates are morphologically connected, as in Mosetén and Gooniyandi. Example (22) shows a complex predicate in Tsafiki in which the coverb *ja* 'fly' is combined with the verbal element *lo* 'GO.OUT:GEN':

(22) Tsafiki (Barbacoan; Dickinson 2003: 143)

Aman	*ele*	*kope-bi*	*ne-chi*
now	wild.turkey	bamboo-LOC	foot-LOC

ja-lo*-la-i-ti-e.*
fly-GO.OUT:GEN-PL-BECOME:VCLASS-RP-DECL
'Now they say the wild turkey came flying out of the bamboo.'

Another similarity between the complex predicates in Tsafiki, Jaminjung, Gooniyandi and Mosetén is that they have a category of unmarked stems that combine with the verbal elements to form complex predicates.[17] In many Australian languages, they are referred to as *coverbs* (hence the name *coverb-verb construction* for this type of complex predicates). In Australian linguistics, coverbs are considered a separate parts of speech. They usually appear together with a verbness marker, and often translate into adverbs, adjectives or verbs in other languages. In the Australian language Jaminjung, coverbs belong to an open class of lexical elements and can appear independently in subordinated clauses and other non-finite environments (Schultze-Berndt 2000: 110). Most frequently, however, they occur within a complex predicate construction. The same is the case in Mosetén, where unmarked stems form a large, possibly open class of lexical elements.[18] In most cases, they combine with a finite verbal marker, but they can sometimes appear on their own as ideophones (23), which could be the way these markers developed. McGregor (2002) and Schultze-

Berndt (2001), among others, argue that ideophones also are the plausible source for coverbs in Australian languages.

In all of the languages with complex predicates of this type, other parts of speech such as nouns or adjectives frequently appear in the place of coverbs/unmarked stems. Furthermore, loans can be integrated into the verbal system of the language by appearing in this slot. Cf. the examples in (9) from Mosetén with example (23) from Jaminjung, in which a Kriol loan is integrated by appearing in the coverb-slot of the complex predicate:

(23) Jaminjung (Australian, Jaminjungan; Schultze-Berndt 2001: 142)
Openim *= biyang* ***nga-bili*** *minyga*
open:TR=NOW 1SG>3SG-FUT:GET/HANDLE what's.it.called
bringgla *gani-yu* *yurrag = mulu.*
sprinkler 3SG>3SG-SAY/DO.PST 1PL.INCL.OBL=COLL
'I'm going to turn on the sprinkler, he told all of us.'

Turning to the main topic of this study, the verbness markers of Mosetén, these are likewise comparable to verbal elements in Australian languages such as Jaminjung. First of all, these finite elements usually form a closed class in both Australian languages and Mosetén. The number of elements varies from very few to relatively many. Schultze-Berndt (2000: 534–535) finds that the language with the smallest inventory of verbal elements is Malakmalak, with only six 'verbs'. Of the Australian languages with coverb-verb constructions, Ungarinjin seems to have the largest number of 'verbs' with over 500 entries. Gooniyandi has 12 VMs, but since it has lost all of the erstwhile free verbs, McGregor (2002, personal communication) argues that it does not make sense to regard the bound residues as verbs and therefore considers Gooniyandi to have a large number of verbs. Mosetén is at the lower end of the spectrum with approximately ten verbal elements. Jaminjung has approximately 28 and Tsafiki approximately 33 verbal elements. Comparisons of Australian languages with these structures have given indications about their development. Dixon (2001) argues that coverb-verb systems are part of a cyclic system consisting of four stages: a completely transparent structure of few simple verbs combining transparently with non-verbal elements (stage 1) turn into more lexicalized systems of many simple verbs (stages 2 and 3) until they include a large number of monomorphemic verbs (stage 4). Eventually, stage 4 turns into stage 1 again by reinterpretation of verbal markers due to areal pressure.[19] Mosetén would be found somewhere in stage 2, since the system is becom-

ing lexicalized, but one can still confirm an overall small number of verbal forms.

The finite elements of coverb-verb constructions thus develop from verbs themselves, which are often used as simple verbs alongside acting as verbness markers in complex predicates (cf. Schultze-Berndt 2000: 540). Thus, the similarity between simple verbs and VMs in Mosetén can probably be attributed to the same development and is not merely accidental, which also can be seen in VMs having a more general meaning and more specific grammatical functions than simple verbs.

In the same way as Mosetén, many of these languages with coverb-verb constructions show similarities between finite elements and verbal markers of, e.g., voice, aspect and motion, which has been attributed to the grammaticalization of high-frequency verbs into derivational verbal markers also in Australian languages (cf. Schultze-Berndt 2000: 540–541).

The function of VMs in Mosetén is classificatory – i.e., events are classified according to their valency and the control attributed to the participants. This is parallel to what takes place in languages with coverb-verb structures. In this way, Jaminjung verbal elements classify the event with respect to valency, locomotion and a number of other functions (cf. Schultze-Berndt 2000: 211–213, 545). This function of verbal elements in complex predicates has sometimes been referred to as 'verbal classification', parallel to nominal classification in other languages McGregor (2002: 1).[20]

I have shown that the total number of verbal elements in Mosetén can be reduced to ten – i.e., Mosetén has a very small inventory of proper 'verbs'. Complex predicates in Mosetén are very similar to coverb-verb constructions in Australian languages and other languages around the world. In this way, coverb-verb constructions should not just be considered an areal phenomenon in Australia, but a typological category of complex predicates found in different parts of the world.

Notes

1. I would like to thank Bill McGregor, Eva Schultze-Berndt for reviewing this paper and giving me very valuable comments. I am also grateful for the comments on this paper by the editors of this book, Matti Miestamo and Bernhard Wälchli, as well as for comments from many other colleagues with whom I have discussed complex predicates in Mosetén.

2. All Mosetén data are based on my own fieldwork on the language between 1999 and 2002. I would like to thank my consultants, especially Juan Huasna Bozo.
3. I am using the Mosetén orthography (cf. Sakel 2004: 50). *Ae* represents the central vowel *ə*. The letter *j* represents a uvular fricative. Cf. Sakel (2004: 50). The syntax of the glosses follow the Leipzig Glossing Rules, and the following abbreviations are used: 1 first person, 2 second person, 3 third person, ANTIP antipassive, APPL applicative, CAUS causative, COLL collective, DECL declension, ERG ergative, F feminine, FOC focus marker, FUT future, GEN genitive, IMPF imperfective, INCL inclusive, INSTR instrumental, INTR intransitive, IRR irrealis, L linker (cf. Sakel 2004: 105), LOC locative, M masculine, OBL oblique, PL plural, PRF perfect, PRS present tense, PST past tense, Q question, RE reflexive, RP repetitions, SG singular, TR transitive, VCLASS verb class, VM verbness marker.
4. The translations of VMs are approximate summaries of their major uses and are used to make the identification of the VMs easier for the reader.
5. Mosetén has a number of less frequent markers that can turn nouns into verbal elements. The majority of them consist of complex predicates, while three markers are monosyllabic: *-tyi-*'eat' (20d), *-dyi-* 'taste good' (20e), *-dyi-* 'do repeatedly' (20f), cf. Sakel (2004: 256, 267–268). These markers are very different from VMs in their distribution: they have a very specific meaning and do not attach to unmarked stems (cf. Table 2, which shows that VMs most frequently form complex predicates in combining with unmarked stems).
6. The vowels /e/ and /i/ vary due to vowel assimilation, cf. Sakel (2004: 36).
7. In my grammar (Sakel 2004), I identified only six VMs. I now also include the unproductive markers *-wi-* 'SEE/HEAR' and *-chhi-* 'MOVE/HAVE', as they are in complementary distribution to the other VMs.
8. L stands for "linker", a marker that links elements within the NP (cf. Sakel 2004: 105–115).
9. *-tyi-* is fused with the 3rd person masculine object marker (cf. Sakel 2004: 230).
10. This text is a part of my large corpus of Mosetén.
11. *Jaem'-tyi-* also means 'to build'.
12. In this environment, *-i-* is realized as *-a-*, cf. Sakel (2004: 46).
13. The closely related language Chimane has similar VMs, apart from *–yi-* 'DO/BE', which form is *-je-*, sometimes combined with *-ya-* (cf. Gill 1999).
14. Apart from their formal and functional similarities, *-tyi-* (in all functions) has idiosyncratic forms in combination with cross-reference markers, which is another argument in favor of these markers being related, cf. Sakel (2004: 231).
15. Only object-affecting voice structures are parallel to VMs.
16. Bill McGregor pointed out to me that a crucial difference between Gooniyandi and Mosetén is that in Gooniyandi none of the VMs have potential freedom of occurrence or correspond to free simple verbs.

17. The combination of coverbs/unmarked stems and finite elements usually leads to different meanings than what they would express if the two elements would appear on their own. The meanings of both parts of the complex predicate are merged; both elements are relational, and it is in their interplay that the semantic participants, as well as the final valency of the complex predicate, is determined.
18. The coverbs can be divided into semantic groups, depending on the finite verbal elements they appear with. Such analyses have been carried out by, e.g., Schultze-Berndt (2000) for Jaminjung and Dickinson (2003) for Tsafiki.
19. Cf. McGregor (2002) for an alternative cyclic model.
20. McGregor's (2002) analysis differs from Schultze-Berndt's (2000) in that McGregor does not regard verbal elements as classifiers of events, but as verbal classifiers in a classification structure, classifying the uninflecting verbs.

References

Agard, Frederick
1977 The auxiliary in Romance. In *Studies in Romance Linguistics,* Michio-Peter Hagiwara (ed.), 14–25. Rowley, MA: Newbury.

Alsina, Alex, Joan Bresnan, and Peter Sells (eds.)
1997 *Complex Predicates*. Stanford: CSLI Publications.

Blake, Barry
1987 *Australian Aboriginal Grammar*. London: Croom Helm.

Butt, Miriam
1997 Complex predicates in Urdu. In *Complex Predicates,* Alex Alsina, Joan Bresnan, and Peter Sells (eds.), 107–149. Stanford: CSLI Publications.

Capell, Arthur
1976 Simple and compound verbs: Conjugation by auxiliaries in Australian verbal systems – Rapporteur's introduction and summary. In *Grammatical Categories in Australian Languages,* Robert M. W. Dixon (ed.), 615–625. Canberra: Australian Institute of Aboriginal Studies.

Crowley, Terry
2002 *Serial Verbs in Oceanic*. Oxford: Oxford University Press.

Dickinson, Connie
2003 Complex predicates in Tsafiki. Ph. D. diss., Department of Linguistics, University of Oregon.

Dixon, Robert M. W.
2001 The Australian linguistic area. In *Areal Diffusion and Genetic Inheritance: Problems in Comparative Linguistics,* Alexandra Y. Aikhen-

vald, and Robert M. W. Dixon (eds.), 64–104. Oxford: Oxford University Press.

Foley, William
1986 *The Papuan Languages of New Guinea*. Cambridge: Cambridge University Press.

Gill, Wayne
1999 A pedagogical grammar of the Chimane (Tsimane') language. Unpublished manuscript, New Tribes Mission, Bolivia.

Heath, Jeffrey
1984 *Functional Grammar of Nunggubuyu*. Canberra: Australian Institute of Aboriginal Studies.

Masica, Colin
1991 *The Indo-Aryan Languages*. Cambridge: Cambridge University Press.

McGregor, William
1990 *A Functional Grammar of Gooniyandi*. Amsterdam: Benjamins.
2002 *Verb Classification in Australian Languages*. Berlin/New York: Mouton de Gruyter.

Sakel, Jeanette
2004 *A Grammar of Mosetén*. (Mouton Grammar Library 33.) Berlin/New York: Mouton de Gruyter.

Schultze-Berndt, Eva
2000 *Simple and Complex Verbs in Jaminjung: A Study of Event Categorisation in an Australian Language*. (MPI Series in Psycholinguistics.) Nijmegen: Max Planck Institute for Psycholinguistics.

Sebba, Mark
1987 *The Syntax of Serial Verbs*. Amsterdam: Benjamins.

Silverstein, Michael
1986 Classifiers, verb classifiers, and verbal categories. *Proceedings of the Twelfth Annual Meeting of the Berkley Linguistic Society*, V. Nikifordiou, M. Van Clay, M. Niepokuj, and D. Feder (eds.), 497–514. Berkeley: Berleley Linguistics Society.

Warner, Anthony R.
1993 *English Auxiliaries: Structure and History*. Cambridge: Cambridge University Press.

Part VI. Complex sentences

Converging patterns of clause linkage in Nagaland

A. R. Coupe

1. Introduction

Past studies of language contact in South Asia have been largely confined to investigations of structural similarities shared by Indo-Aryan, Munda or Dravidian languages, e.g., Emeneau (1956), Gumperz and Wilson (1971) and Nadkarni (1975). This paper shifts the focus of attention to the north-eastern corner of India, the most linguistically-diverse region of the sub-continent, and yet still the most scantily documented. The following discussion presents evidence of linguistic convergence in Nagaland, a state of north-eastern India where at least two dozen distinct languages are spoken in a mountainous area of 16,500 km^2, approximately one fifth the size of Austria.

My personal interest in this topic has grown out of a grammatical description of the Mongsen dialect of Ao that was originally submitted as a doctoral dissertation at La Trobe University (Coupe 2003, forthcoming), and through subsequent research on the typology of clause linkage in Tibeto-Burman languages (henceforth TB languages).[1] Recurrent syntactic patterns and other commonalities in TB languages and unrelated languages in contact suggest that these phenomena might be attributed to linguistic convergence facilitated by bilingualism. This chapter investigates those recurrent syntactic patterns and discusses the nature of linguistic convergence in Nagaland using data from the TB languages Mongsen Ao, Chang and Khiamniungan, an eastern variety of the Indo-Aryan language Nepali, and a lingua franca with an Indo-Aryan base known locally as Nagamese (also known infelicitously as Naga Pidgin).

Thomason and Kaufman (1988: 37–41) make reference to two basic types of contact-induced language change: borrowing and substratum interference, although they find that the term "substratum" proves to be overly restrictive. The term is also somewhat inappropriate for describing the characteristics of interference in Nagaland, since no single language of those demonstrating evidence of convergence may claim to have greater prestige than any other. Thomason and Kaufman note that the greatest degree of interference is to be found in circumstances of imperfect bilingual-

ism. Their observations are made in the context of language shift, in which a speech community abandons one language for another. However, the linguistic situation encountered in Nagaland suggests that substantial interference may also occur in the absence of shift. In the case of the Assamese-based lingua franca Nagamese, it will be argued that imperfect learning of the base language has created an avenue for the calquing of morpho-syntactic structures native to TB languages. Bilingualism, too, appears to have resulted in limited structural borrowing in the opposite direction, i.e., from unrelated languages in contact to TB languages of Nagaland.

The chapter has the following structure. Section 2 provides some historical background on the languages of this study and the data sources. Section 3 describes the characteristics of clause combining in the South Asia linguistic area and finds that a non-finite verb form used for clause linkage in both TB and unrelated languages of Nagaland conforms to a distinct type of converb in its functional range. Section 4 compares the structure of disjunctive clause linkers in TB and Indo-Aryan/Indo-Aryan derived languages, and Section 5 discusses a widely occurring pattern of disjunctive interrogative clause. Section 6 investigates relative clause strategies available to TB languages and compares these to relative clause strategies found in Indo-Aryan languages (henceforth IA languages). Section 7 considers an instance of case marker borrowing in one dialect of Ao, and the chapter concludes with a discussion of the findings in Section 8.

2. Historical context and sociolinguistic setting

The data to be presented here come from my field notes on the above-mentioned languages of Nagaland. Most of the language examples are taken from recorded folklore narratives or commentaries on the Pear Story film and other visual stimuli. The Ao material was compiled on a number of field trips between 1996 and 2005, and the Chang, Khiamniungan, Nepali and Nagamese material was collected on annual field trips undertaken between 2004 and 2006. Since little information has hitherto been published on any of the languages spoken in Nagaland, the following overview serves to provide some historical context for the subsequent discussion of linguistic convergence.

The Ao language is spoken by approximately 170,000 people in the hills of the Mokokchung district at the eastern edge of the plain of Assam.[2] Speakers recognize two major dialects – Chungli, the prestige variety, and Mongsen. While the higher-level affiliation of Ao is yet to be definitively

determined, there is general agreement in the comparative literature that the dialects of the language form a lower level sub-grouping with Lotha, Sangtam and Yimchungrü, all spoken across the central region of Nagaland.[3] According to Mackenzie ([1884] 1995: 400), the geographical location of the Ao and the Lotha benefited them as middlemen in the trade between the plains and the interior. Furthermore, he noted that some men of the tribes bordering the plain of Assam knew Assamese and functioned as spokesmen in their tribes' dealings with the plains people. This is corroborated by the eyewitness account of Lieutenant Bigge, who in 1841 encountered a party of about seventy Lotha cotton traders at the plains town of Golaghat, many of whom reportedly understood Assamese (Bigge [1841] 1969: 228). Presumably these regular business contacts with the plains were instrumental in the development of a regional variety of Assamese as a trade language (see below for further discussion).

Chang (about 32,000 speakers) belongs to the Konyak group of the Bodo-Konyak-Jinghpaw branch of Tibeto-Burman, as recently proposed by Burling (2003). These languages were previously designated the 'sal' languages in Burling (1983).[4] A distinct dialect of Chang is spoken in the villages of Jakpa, Noksan and Litim, all located on a south-western range of Tuensang district. Part of this range abuts the Ao district of Mokokchung, from which it is separated by the Dikhu River. The villages of Jakpa, Noksan and Litim are notable for a very high percentage of Chang–Ao bilingualism. Possibly they were former Ao villages that were annexed by the Chang, following which their Ao inhabitants were absorbed into the Chang tribe. This might explain the high rate of bilingualism. There are still a few Ao-speaking villages on the eastern side of the Dikhu River and others with Ao names that are currently inhabited by other tribes. We may infer from this that the Ao were the older inhabitants of this area, prior to their land and perhaps some of their population subsequently being colonized by other tribes migrating from the east.

Khiamniungan (about 24,000 speakers) also appears to be related to the Konyak group of the Bodo-Konyak-Jinghpaw branch on the basis of lexical correspondences. Khiamniungan is spoken in the Tuensang district of eastern Nagaland, to the immediate east of the Chang-speaking territory. All three of the TB languages of this study – Ao, Chang and Khiamniungan – are spoken in adjoining tribal areas of Nagaland and in that geographical order, stretching eastward from the edge of the plain of Assam and across the Naga Hills to the international border on the Patkai Range. Some dialects of Khiamniungan are additionally spoken in adjacent areas of Burma.

Nepali (about 32,000 speakers in the state of Nagaland) is an IA language of the eastern Pahari branch, spoken in many towns of Nagaland by descendents of Assam Rifles soldiers and more recent immigrants from other Nepali-speaking areas. Their ancestors were originally native speakers of Magar, Gurung, Limbu, Tamang, and other TB languages of the Himalayan foothills of Nepal. These native TB language speakers were recruited from Nepal by the British in increasing numbers after 1870 to police the north-eastern frontier (Shakespear [1929] 1980: 7). The military outposts established by the British probably also provided the social milieu for intermarriage between local tribal women and Nepali sepoys, and the concomitant spread of the Nepali language. According to Morris (1936: 126), it was the official policy of the British to encourage the establishment of Gurkha colonies (i.e., "lines") near their cantonments (cited in Bradley 1996: 765). Even nowadays it remains common for speakers of local TB languages living near Assam Rifles camps in Nagaland to have some proficiency in speaking Nepali. Arkong Ward, for example (known until recently as Phāḷṭu Line – from Nepali फाल्टु *phaːḷṭu* 'extra, spare'), is an erstwhile Gurkha residential colony of the nearby Assam Rifles headquarters at Mokokchung and is noteworthy for the number of households with mixed marriages and a correspondingly high frequency of trilingualism in Nepali, Nagamese and a TB language.

The type of Nepali spoken in Nagaland is somewhat divergent from the standard variety spoken in the Kathmandu valley of Nepal. The most salient differences are a significant degree of paradigmatic levelling in person, number and gender agreement marking on the verb, the loss of honorific register distinctions, and the adoption of a large number of Hindi and Assamese loan words and grammatical particles. The simplified verbal inflectional paradigm and lexical divergences found in this eastern vernacular dialect of Nepali may be attributable to the fact that it was initially used by Gurkha sepoys whose first language was a Tibeto-Burman tongue. For these speakers of mutually unintelligible TB languages, Nepali must have served as a contact language that was imperfectly learned in the absence of the standardizing influence of native speakers from the Kathmandu valley.

The fifth language of this study is Nagamese, a contact language used throughout Nagaland by speakers of various Indian and TB languages when they need to speak with anyone outside of their respective speech communities. It uses a simplified form of Assamese syntax as its base,[5] but also draws on Hindi, Nepali and English to extend its essentially Assamese lexicon. There is some evidence to suggest that the Assamese lexicon is undergoing limited relexification with loan words from these languages.

Nagamese is rightfully viewed as an imperfectly learned form of Assamese; as such, it demonstrates many typological features of IA languages with respect to its grammar. Consequently it fits comfortably into the IA dialect continuum that stretches across northern India from Nagaland to Pakistan.[6] As a variety of Assamese, Nagamese differs substantially from the characterizations of pidgin languages found in the literature, such as the plantation pidgins with their European lexifiers. For instance, it is not an isolating language, but has morphologically complex patterns of clause linkage that reflect its IA heritage, it demonstrates a great deal more inflectional and derivational morphology than assumed to be typical for a pidgin, and it can be understood by standard Assamese speakers, for whom it is probably just a divergent regional variety. At the same time, it demonstrates the effects of interference from TB languages in contact. The most obvious of these is found in its phonology, which varies according to the phonological characteristics of the native TB or IA language of the bilingual speaker. It will be shown in following sections that the effects of interference also manifest in the syntactic structure of Nagamese clause linkage.

Estimating the precise number of speakers is difficult, but we can confidently assume that anyone who lives in a town of Nagaland with mixed ethnic populations will have at least reasonable ability in speaking the language. Beyond the towns, my personal experience is that those who have spent some time living or travelling outside of their speech community will speak Nagamese fluently, while women and children whose lives have been confined to the village are more likely to be monolingual in their particular TB language.

Nagamese is increasingly functioning as a first language in some social settings. This is certainly the case in families whose marriage partners are both speakers of mutually unintelligible languages, but it is also true of some ethnic communities that have lost their ancestral TB language, such as sections of the Kachari community in Nagaland's commercial hub of Dimapur. A TB language does not have to be seriously endangered, however, for Nagamese to begin creeping into some of its social domains. For instance, I have observed the young children of a Mongsen-speaking household of Dimapur using Nagamese as the sole language of communication in their games. Obviously the multilingual mosaic of Dimapur encourages the children's use of a common language when they play with children from other speech communities. Nagamese then becomes the sole vehicle for interaction in that particular social activity, regardless of the linguistic ethnicity of the participants.

3. Converbs in the South Asian Sprachbund

A pervasive typological feature of verb-final languages of South Asia is their use of non-finite verb forms for linking clauses in potentially long chains of narrative structure. These are known by a hodge-podge of names, the commonly used terms in the South Asian linguistic tradition being gerund, verbal participle and conjunctive participle (see Masica 1976: Ch. 4 for discussion of terminology). The term *converb* has recently gained currency in the typological literature (cf. Haspelmath and König 1995 and references therein), and it is this term that will be adopted in the following discussion.

The bolded converbs of sentences (1) and (2) below demonstrate the type of structure to be discussed. Sentence (1) additionally reveals a distinctive peculiarity of the narrative chaining converb of South Asia that often allows more than one interpretation of its meaning. In contrast, the specialized converb of (2) only permits a predictive irrealis presupposition.

(1) Mongsen Ao: narrative chaining/temporal adverbial modification[7]
hənsəli-la nə ***pùŋtsəŋ-əɪ,*** *a-hən təpuŋ-la sə*
leopard.cat-F AGT pounce-CVB NRL-chicken cock-F ANAPH
ípáʔ hmapaŋ sə ku thəm-tʃuk.
EMPH time ANAPH LOC end-PFV.PST
(i) 'Leopard Cat pounced and at that time [the life of] Rooster ended.'[8]
(ii) 'When/after Leopard Cat pounced, ….'

(2) Khiamniungan: conditional presupposition
$wo^{55}ɲiʏ^{31}$ $nɔ^{33}$ $wo^{55}ɲiʏ^{31}$ $waʏ^{31}$ $nɔ^{33}$ ***$ʃi^{55}$-$hɔ^{31}$-$naj^{31}$$tə^{33}$***
bird.SP DEM bird.SP bird DEM come-perch-COND
$ɲiʏ^{31}ɲiʏ^{31}ɲiʏ^{31}ɲiʏ^{31}$ ta^{31} $ɲu^{31}$-$tʃɛ^{33}$.
ONOM thus say-PRS
'If a Black Bulbul comes and perches, it chirps "nyu, nyu, nyu, nyu."'

Masica (1976: 108–109, 1991: 399–401) observes that the converbs of South Asian languages differ from those of European languages by virtue of the fact that a non-finite verb form can often be interpreted semantically as encoding either a subordinated or a coordinated event, despite its clause being syntactically dependent. This was explored further in a review by Bickel (1998), who proposed the recognition of a separate category of "Asian converb". The Asian converb, seemingly unique to the languages of South, Central and East Asia, is distinguished from strictly modifying

European converbs and strictly clause chaining Papuan medial verbs by demonstrating a semantic overlap between its modifying and chaining functions.

Bickel's proposal needs to be clarified with respect to the present work. In the TB languages of Nagaland we can make a clear distinction between two major subsets of converb. In each language there is usually just a couple of converb suffixes available for encoding multiple sequences of coordinated events in dependent clauses, as well as allowing for a range of pragmatically determined adverbial interpretations of their meanings. In opposition to this small subset will be a handful of other converb markers that have highly specific and invariable presuppositional meanings, the common ones being condition, concession, reason and temporality. The very specific semantic entailments of this second subset ensure that they are dedicated to expressing presuppositional notions only. Furthermore, because such semantic expression must be encoded within bi-clausal structures – such as protasis and apodosis, cause and effect, and so forth – these structural and semantic limitations also prevent members of the specialized subset from participating in narrative chaining, unless of course they occur in sentences that are interwoven with narrative chaining converbs encoding sequences of events.

The languages of Nagaland certainly give strong support to Bickel's notion of a typologically distinct Asian converb. In Mongsen Ao for example, the sequential converb can be used for both narrative chaining and temporal modification. In some contexts the interpretation seems arbitrary, as in (1) above; in others, a particular interpretation is enforced, either by contextual pragmatics or by the accompanying clausal morphosyntax. This is illustrated in (3b). The continuative aspect marker on the converb stem and the temporal relativization that follows both seem to suggest that only a modifying temporal qualification should be interpreted from this sentence's converb clause.

(3) a. Mongsen Ao: narrative chaining[9]

tsəŋtàphəlaʔ	*tə-tʃhatsə*	*à*	***là-(ə)ɪ***	*táŋ,*	
lightning	NRP-be.dangerous	one	strike-CVB	just	
màsà(ʔ)-la	*tʃu*	*alitìjùŋ*	*nə*	***səmà-(ə)ɪ***	*thəp-tʃak-iʔ.*
cattle-F	DIST	half	INS	split-CVB	drop-RES-CAUS.PST

'A dangerous bolt of lightning just struck the bull and it split and dropped in halves.'

b. Mongsen Ao: temporal adverbial modification
á-hlú ***jìm-ja-(ə)ɪ,*** *a-ʧak* *ʧʰuwa-pàʔ*
NRL-field cultivate-CONT-CVB NRL-paddy emerge-NR
hmapaŋ *ku,* *pùŋì* *nə* *a-ʧak* *ʧu* *ʧàʔ.*
time LOC wild.pig AGT NRL-paddy DIST consume.PST
'When [he] was cultivating the field, at the time the paddy was sprouting, a wild pig ate the paddy.'

The semantic versatility of the Mongsen sequential converb is further revealed by its ability to encode the attendant circumstances of a state or a manner of activity, as *ni-(ə)ɪ* does in (4) below. When used like this, the converb's meaning resembles that of an English adverb derived by the *-ly* suffix.

(4) Mongen Ao: adverbial manner modification
tsəŋɹutshə-la *sə* *məʧatshàŋ* *nə* ***ni-(ə)ɪ*** ***wa-(ə)ɪ,***
personal.name-F ANAPH personal.name AGT lead-CVB go-CVB
tuŋət *li-ukù* *ʧəj.*
3DU stay-ANT PTCL
'After Tsengrutsela was led away by Mechatseng, they stayed together.'

In this usage, the sequential converb occurs in constituency with an adjacent verb or another sequential converb and together their juxtaposed predicates refer to a single event, with the former describing the manner in which the latter is performed. In some respects this correlates with the use of serial verb constructions common to isolating languages, especially when the predicates in series share the same referent, matrix clause illocutionary force and domain of intonation. A pause following *ni-(ə)ɪ wa-(ə)ɪ* (signalled by a comma in [4]) prosodically marks off the dependent clause with its tightly integrated converbs from the matrix clause. As is common in many languages of the world, a characteristic intonation often precedes the pause. The Mongsen non-final intonation has a very distinctive high falling-rising pattern that serves to mark the boundary of a dependent clause while simultaneously signalling its non-final status. The non-final intonation is only realized over the clause of a converb functioning as a sentential adjunct, and never when it functions as a converbal adjunct in the manner of *ni-(ə)ɪ* in (4). The clause boundary-marking intonation demonstrates a complete disregard for the underlying lexical tones of individual syllables, which can be significantly distorted by its imposition.

An identical conflation of functions is evident for the sequential converb of Chang. Furthermore, the characteristic high falling-rising intonation pattern noted above for Mongsen is also found in identical narrative chaining domains in Chang. Recall that Chang villages located at the eastern edge of the Ao territory have a high incidence of Ao-Chang bilingualism, suggesting a possible avenue for the sharing of an identical prosodic pattern across members of distinct branches of the Tibeto-Burman family.

(5) a. Chang: narrative chaining
*haʊ^{11}-eɪ^{55}-puɯ^{55} maŋ^{11}jʊk^{55}-a^{11} pop^{55} **kəm^{55}-an^{11}**,*
3SG-INS-GEN shirt-LOC pouch make-CVB
*pu^{55}hek^{11} pən^{55}toʊ^{55} khən^{55}eɪ^{11} **khəɪ^{55}-an^{11}** **tʃɪn^{55}-an^{11}**,*
fruit all there pluck-CVB put-CVB
*ɲʊŋ^{55}kəɪ^{11} tɯ^{55}kɯː^{11} **kəm^{55}-an^{11}**, **khəɪ^{55}-an^{11}** **tʃɪn^{55}-an^{11}**,*
bag like.that make-CVB pluck-CVB put-CVB
pu˩^{11}-ɲu˩^{55}-kaʔ^{11} lot^{55}.
tree-AUG-ABL descend.PST
'He made a pouch in his shirt and put all the plucked fruit in there, in the manner of a bag, and he plucked and put [the fruit] in there and came down from the tree.'

b. Chang: manner adverbial modification
*mət^{55} tʃe^{11}-eɪ^{55} loːn^{11} **kow^{55}-an^{11}** taːn^{55}-kəj^{11}.*
person one-AGT goat pull-CVB pass.by-AUX.PST
'A man passed by pulling a goat.'

The sequential converb of Khiamniungan is a little different from that of the other TB languages. While my research experience on Khiamniungan converbs is currently not as extensive as for Mongsen or Chang, the general pattern emerging from texts at hand suggests that converbs formed with *-kə^{33}taʔ^{33}* are preferred for sequencing anterior events (as in 6a), whereas those formed with just *-kə^{33}* are most commonly used to encode simultaneous events denoting an attendant state or a manner of activity (as in 6b).

(6) a. Khiamniungan: narrative chaining
noŋ^{31} ʃɛp^{33} nə^{31} a^{33}pa^{33} (ə)ʔ^{33} pan^{31}-san^{55}-tay^{33} nə^{31}
DEM fruit DEM 3SG AGT pluck-take.out-keep DEM
ɛp^{31}-kə^{33}taʔ^{33} *taw^{31}kom^{33}kej^{33} nə^{31} lɛ^{33}-tay^{33}.*
see-CVB bicycle DEM lay.down-keep.PST
'After seeing the fruit that he [= the man] had put aside, [the boy]

laid the bicycle down.'

b. Khiamniungan: manner adverbial modification
a^{33}*pa*^{33} **tɛn**^{51}**-kə**^{33} *khu*^{31}*-an*^{31}.
3SG pull-CVB go-PFV.PST
'He went away pulling [the goat].'

Exchanging the narrative chaining marker *-kə*^{33}*ta?*^{33} for the form *-kə*^{33} in textual examples usually results in a change of meaning from one of sequence to simultaneity and vice-versa. Yet sometimes these two markers appear to encode equivalent meanings, suggesting that one may be a phonologically reduced form of the other. Consider the following textual example, spontaneously uttered in response to a scene from the Pear Story:

(7) Khiamniungan: narrative chaining
a^{33}*pa*^{33} *lo*^{33}*tə*^{55} *ʃɛp*^{33} *ʃɛp*^{33} *nə*^{33} *tə?*^{33} **than**^{55}**-kə**^{33},
3SG now fruit fruit DEM PAT touch-CVB
ʃəp^{33} *ʧha*^{31} *nə*^{33} *tə?*^{33} **than**^{55}**-kə**^{33}*ta?*^{33},
fruit basket DEM PAT touch-CVB
ha^{33}*laj*^{33} **ŋo**^{31}**-lu**^{31}**-kə**^{33}, *a*^{33}*pa*^{33} *(ə)?*^{33} *ʃɛp*^{33} *ʧha*^{31} *nə*^{33}
above look.up-CON-CVB 3SG AGT fruit basket DEM
luk^{55}*-lo?*^{51}.
pick.up-take.PST
'After touching the fruit, after touching the basket, he looked up to check [that the owner didn't notice] and he picked up and took the basket.'

In (7) the speaker restates the information of the first line of interlinearization, but in his repetition he uses the form *than*^{55}*-kə*^{33}*ta?*^{33} instead of the original reduced form *than*^{55}*-kə*^{33}. When questioned about this, he concluded that *than*^{55}*-kə*^{33} and *than*^{55}*-kə*^{33}*ta?*^{33} conveyed the same meaning in that sentence and could be used interchangeably, as his reiteration suggests. Unlike the sequential converbs of its TB neighbours to the west, no particular intonation patterns that might help to distinguish different types of functions are noted for any converb clauses of Khiamniungan.

The examples presented thus far indicate that a fair degree of semantic latitude is common to narrative chaining sequential converbs in the TB languages of Nagaland, but the phenomenon seems even more pronounced in Nepali and Nagamese. This is possibly because they have a smaller inventory of converb forms that carry a correspondingly higher functional load for expressing a range of different meanings. Note how the same con-

verb marker of Nepali is used for both narrative chaining and adverbial manner modification in (8a–b), and an identical conflation of functions can be observed in the Nagamese converbs of (9a–b).

(8) a. Nepali: narrative chaining
ga-era *āun-chu* *hai.*
go-CVB come-1SG.NPST PTCL
'I'll go and come [back], OK?'

b. Nepali: manner adverbial modification
ek *jana* *bacā … keṭā … saikal* *mā …*
one CLF child boy bicycle LOC
saikal ***car-era*** *āun-dai-cha,* *bāṭo* *mā.*
bicycle climb-CVB come-PROG-3SG.NPST road LOC
'A child … a boy … on a bicycle …, is coming riding a bicycle, on the road.'

(9) a. Nagamese: narrative chaining:
naspati *paɹ-koɹ-a* *taim* *te* *chokɹa* *to* *saikəl*
pear pass.by-do-PTCP time LOC boy PTCL bicycle
paɹa ***olai-kena,*** *saikəl* *to* *ɹasta* *te* ***ɹaki-kena***
ABL remove-CVB bicycle PTCL road LOC put-CVB
manu *ke* ***sai-kena*** *naspati* *ek-ta* *olai-se.*
man ACC look-CVB pear one-CLF remove-PST
'At the time of passing the pears, the boy dismounted from his bicycle, laid it upon the road, looked at the man and took one pear.'

b. Nagamese: manner adverbial modification
ami ***kandi-kena*** *uti-se.*
1SG cry-CVB arise-PST
'I woke up crying.'

Although the narrative chaining function is the most widely attested use of the Nagamese sequential converb, that does not preclude it from expressing other semantically distinct propositions in addition to the manner adverbial meaning demonstrated in (9b). In (10) for example, the converb clause can only be interpreted as encoding a cause for the effect expressed by the main predication.

(10) Nagamese: causal adverbial subordination
manu ***sai-kena*** *thaka* *nai* *to* *tai* *ek-ta* *baskət*
man look-CVB stay NEG PTCL 3SG one-CLF basket

puɹa saikəl te ɹaki-se.
whole cycle LOC put-PST
'Because the man wasn't looking he put the whole basket on his bicycle.'

To sum up this section, it has been shown that all the languages investigated offer strong support for the recognition of a distinct type of Asian converb. This is capable of encoding various pragmatically-determined meanings in addition to providing a basic means of sequential clause linkage. The Asian converb is admittedly endemic to a much wider linguistic area than just that of South Asia. Even so, the fact that the Indo-European languages of Europe do not conflate narrative chaining and modifying functions in the same converb form, while those of South Asia do, ultimately leads us to suspect that the phenomenon could be attributable to linguistic convergence with languages of the subcontinent that make extensive use of narrative chaining. Furthermore, unlike the TB languages, IA languages possess a native conjunction word class that is perfectly adequate for clausal coordination, therefore their grammars have no real functional need for a sequential clause-linking converb. This makes it all the more remarkable just how similar the narrative structure of Nepali and Nagamese is to that of the TB languages of Nagaland.

4. Disjunction

Disjunction is a type of coordinative clause linkage used to express alternatives. The disjunctive pattern of clause linkage in Nagamese demonstrates an identical morphological structure to the Mongsen Ao pattern. In both languages the disjunctive operator is encoded by the collocation of a negative prefix, a verb root expressing a generic meaning of 'be' or 'do', and a conditional converb suffix. In Mongsen Ao, the conditional converb marker has grammaticalized from a fusion of the general nominalizer/relativizer suffix *-pàʔ* and the topic particle *la.*

(11) a. Mongsen Ao: conditional presupposition
nàŋ ***ɹà-pàla*** *inət tʃà(ʔ)-ì-ùʔ*
2SG come-COND 1DU.IN eat-IRR-DECL
'If you come, we'll eat.'

b. Mongsen Ao: disjunctive clause linkage
tsəŋikhu a-səm ni
day NRL-three day
mə-ʧhà-pàla *átshə́kjìm phəli ni a-ʧu*
NEG-do-COND cold.season four day NRL-DIST
'In three days, or if it's winter, that's four days' [after which the rice beer is ready to drink].

An identical pattern of disjunctive clause linkage found in Nagamese raises the suspicion that it may be attributable to syntactic convergence between genetically unrelated languages in contact. Of course, we are not in a position to establish the direction in which convergence has occurred. Nor is it presently possible to establish more generally the extent of convergence in IA and TB disjunctives, other than to note that an exact morpheme-for-morpheme copy is also found in the disjunctive collocation of standard Assamese.[10]

(12) a. Nagamese: conditional presupposition
tai ghoɹ te ***ahi-le*** *bhat khā-bo.*
3SG house LOC come-COND food eat-FUT
'If s/he comes to the house [we] will eat.'
b. Nagamese: disjunctive clause linkage
fəɹst wīk ***nə-hoi-le*** *sekənd wīk te jā-bo*
first week NEG-be-COND second week LOC go-FUT
hobola.
EPIST
'[We] will probably go in the first week, or if not, in the second week.'

Disjunctive clause linkage in Nagaland Nepali also shows some similarity to the morphological structure common to Nagamese and Mongsen Ao. In standard (Kathmandu) Nepali, the disjunctive 'or' is expressed by *bhaena pani*. This uses *bhaena*, the third person singular negative past tense inflection of the verb 'to be', and the emphatic particle *pani*. However, many Nagaland Nepali speakers jettison the negative verb stem in favour of a preverbal negative particle and *bhae*, the positive polarity past tense inflection of 'to be'. An emphatic particle *bhī*, a Hindi loan, replaces the Kathmandu Nepali emphatic particle *pani*. The resulting Nagaland Nepali disjunctive form is *na bhae bhī*, reflecting a closer alignment to the pattern shared by Mongsen Ao and Nagamese.

5. Disjunctive interrogatives

Disjunctive interrogatives are based on an 'A-not-A' template in the TB languages of Nagaland, a pattern that is widely attested throughout the languages of the Sino-Tibetan super stock. The Mongsen Ao interrogative sentence of (13) is representative of this ubiquitous pattern. The first verb of the construction has positive polarity, the second verb has negative polarity, and an interrogative particle intervenes to function as the disjunctive operator.

(13) Mongsen Ao: disjunctive interrogative
ʧà(ʔ)-ì *sə̀* *mə̀-ʧà(ʔ)-ì.*
consume-IRR Q.PTCL NEG-consume-IRR
'Will [you] eat or not?'

As a result of contact with TB languages, Nagamese and Nagaland Nepali have adopted the same clause structure for encoding disjunctive questions. In Nagaland Nepali, the disjunctive operator *ki* of standard Kathmandu Nepali has additionally been replaced by a negative morpheme in future contexts, while use of the disjunctive operator *na* of Nagamese is not constrained by temporal setting. The resulting structure in both languages is an isomorphic copy of the TB disjunctive interrogative template.

(14) Nagamese: disjunctive interrogative
apuni *khā-bo* *na* *na-khā-bo.*
2SG consume-FUT Q.PTCL NEG-consume-FUT
'Will you eat or not?'

(15) Nagaland Nepali: disjunctive interrogative
khā-nē *na* *na-khā-nē.*
consume-INFIN.PTCP Q.PTCL NEG-consume-INFIN.PTCP
'Will [you] eat or not?'

It is also pertinent to mention that the range of functions of the disjunctive operator *na* in Nagamese and Nagaland Nepali closely accord with those of Mongsen Ao, since all three languages use their disjunctive operators synchronically as sentence-final interrogative particles in simple polar questions. Lastly, the 'A-not-A' disjunctive interrogative structure found in standard Kathmandu Nepali – e.g., *cha ki chaina* 'Is [it] there or not?' – is

itself most likely an older copy of the widespread TB disjunctive interrogative template that has been borrowed from TB languages spoken in Nepal.

6. Converging relative clause strategies

Two strategies are normally available to IA languages for creating relative clauses or their functional equivalents. These are the relative-correlative construction (e.g., 16a), and the participial construction (e.g., 16b). The relative-correlative construction tends to be used extremely rarely in Nagaland Nepali and Nagamese, speakers much preferring to employ the participial option exemplified by (16b). Heads of relative clauses are henceforth bolded in examples; relative clauses are identified by square brackets.

(16) a. Nagamese: relative-correlative construction
[*jun* *manu* *ahi-se* *le*]
which man come-PST TOP
utu ***manu*** *amaɪ* *kokai* *ase*
that man 1SG.POSS older.brother be.PRS
'The man who came is my brother.'
[Lit. 'Which man came, that man is my brother.']

b. Nagamese: participial construction
to *itu* ***mān*** [*kori* *thak-a*]
PTCL DEM worship do stay-PTCP
'Thus, this worship that was being done …'

The Nagamese complex sentence of (16a) generally conforms to the relative-correlative pattern common to all IA languages of the subcontinent. The "relative" clause is introduced by a relative pronoun *jun.* It contains a shared argument *manu* 'man' that is coreferential with the optionally repeated *manu* in the higher clause, here introduced by the distal demonstrative *utu*, and it is syntactically dependent despite its clause being headed by a finite verb form. Somewhat uncharacteristically for an IA language, a topic particle *le* occurs at the end of the "relative" clause. This suggests that the "relative" clause is functioning as a type of topic, to which its superordinate correlative clause serves as a comment. Note that the phonological form of the topic particle is homophonous with the Nagamese conditional converb suffix *-le* (cf. [12a–b] above). A diachronic relationship is known to exist between topic particles and markers of sub-

ordinate clauses in a number of different language families and has been discussed in Haiman (1978) and Bickel (1993).

The participial construction exemplified by (16b), also widely attested in IA languages, contains an adjectival participle and a gap, the latter corresponding to the head of the shared argument *mān* 'worship' in the higher clause. A peculiarity of (16b) is the position of the head with respect to the participle. Here it precedes the participle, whereas all twenty-six examples of IA participial constructions provided by Masica (1991: 409–410) have their heads after the participle. A Nagamese speaker confirms that the head of this construction could alternatively follow its participial verb form. Since Mongsen, Chang and Khiamniungan similarly allow their heads to either precede or follow their nominalized verb stems in relative clauses, we may suspect that interference from the TB languages of Nagaland has had a hand in influencing Nagamese structural patterns, or in this case, their alternatives.

The native TB strategy for forming relative clauses involves a structure that accords closely with the IA participial construction. A verb stem is nominalized by a derivational suffix to function as an attributive nominal modifier of its head, and a gap in the relative clause corresponds to the shared argument in the higher clause. This structure is illustrated below by (17a) and (17b), respectively demonstrating pre-head and post-head relative clauses in Mongsen Ao.

(17) a. Mongsen Ao: prenominal relative clause
[*mətʃatshàŋ nə tsəŋ-pàʔ*] ***a-úk*** *sə*
personal.name AGT spear-NR NRL-pig ANAPH
'The [aforementioned] pig that Mechatseng speared …'

b. Mongsen Ao: postnominal relative clause
nì a-ki [*ípáʔ mətəm i tʃhà-tʃhət-pà(ʔ)*] *i*
1SG NRL-house EMPH manner PROX make-ABIL-NR PROX
'My house that [I] am able to build like this here …'

Given that Mongsen Ao already possesses a more than adequate means of forming relative clauses and the freedom to relativize on any core NP argument of the clause, the occasional occurrence in texts of examples such as (18) points to evidence of structural borrowing in the opposite direction, i.e., from IA to TB.

(18) Mongsen Ao: relative-correlative construction
pa *thak* *ku* [*"tʃə́pá?* *tʃhà-mì-ə̀ɪ* *la*] *tʃh(à)-aŋ."*
3SG PLACE LOC what do-DESID-PRS TOP do-IMP
'To it [i.e., the lightning, he said] "Whatever you want to do, do it!"' [in order to placate it].

The structure of this complex sentence bears a very strong resemblance to the Nagamese relative-correlative pattern with its atypical topic marking, as demonstrated above in (16a). Firstly, because TB languages lack a relative pronoun word class, an interrogative pronoun must be pressed into service as a relative pronoun to introduce the "relative" clause. Nadkarni (1975) reports an identical use of interrogative pronouns in Dravidian languages that have borrowed the relative-correlative structure through linguistic convergence with IA languages.[11] In terms of function, the dependent clause of (18) encodes much the same meaning as an IA "relative" clause; i.e., it serves to restrict the reference of the head of its NP. Secondly, just like the "relative" clause of the IA relative-correlative construction, the "relative" clause of (18) resembles an independent clause because it contains a finite verb, yet is syntactically in a dependent relationship to its higher (correlative) clause. This is because the topic particle that occurs at the end of the dependent clause establishes its pragmatic status as a type of topic, to which the matrix clause functions as a comment. A topic generally cannot be used in the absence of a comment, therefore this constitutes a type of clausal dependency. As in Nagamese, there is an obvious diachronic relationship between topic particles and conditionals (cf. the Mongsen Ao conditional converb clause of [11] and the preceding discussion), as well as other types of subordinate clause markers. Lastly, although the higher clause lacks a demonstrative or equivalent constituent that corresponds to the shared argument of *tʃə́pá?* in the "relative" clause of (18), in this case it is understood to be pragmatically recoverable from the context.[12]

Relative-correlative constructions are widely reported in TB languages of the "Indosphere" and adjacent "buffer zones" (see Hildebrandt, this volume), but appear to be absent in TB languages that have been quarantined off from IA influence. This distribution is strongly indicative of linguistic convergence as an explanation for the prevalence of relative-correlative constructions in the TB languages of the South Asian region. The innovation of a topic particle to mark the boundary of the "relative" clause in the relative-correlative constructions of both Nagamese and

Mongsen Ao appears to be especially diagnostic of convergence in the grammars of these two languages.

7. Morphological borrowing

A final piece of evidence for language contact is suggested by the morphological form of the agentive case-marker in the Chungli dialect of Ao. This is phonologically divergent from the known forms of agentive/ instrumental markers found in the other members of the Ao subgroup of Tibeto-Burman. Whereas the phonological form of the Chungli Ao agentive/instrumental marker is *i*, in the Mongsen dialect of Ao it is *nə*, and in Yimchungrü it is also *nə*. A Lotha case marker that Acharya (1983: 103) glosses as nominative and instrumental has the phonological form *na* and is undoubtedly cognate with the agentive/instrumental case markers of the above-mentioned languages. The corresponding marker of Sangtam is not known, but taking into account the most common phonological shape of the agentive/instrumental postposition in the languages of this group, it appears that a syllable with a dental nasal and a central vowel should be reconstructed for a putative Proto-Ao Group stage. This makes the origin of the Chungli Ao agentive/instrumental form *i* all the more mysterious, but much less so once areal influences are taken into account.

We should begin by noting that the Chang agentive/instrumental case marker *-er*^{55} is suspiciously similar to the Chungli Ao form. In the Mokokchung district there are generally concentrations of Mongsen Ao villages on the western ranges and Chungli Ao villages on the eastern ranges, some adjacent to the Chang tribal area. Recall from the discussion of Section 2 above that the Chang villages bordering the Mokokchung district have a high incidence of Ao-Chang bilingualism, and that erstwhile Chungli Ao villages located on the eastern side of the Dikhu River were probably annexed by the Chang during the latter's migration from the east. The Ao vowel phoneme inventory is rather small and has just one front vowel, viz. *i*. If the agentive form of Chang was borrowed into Chungli, then the paucity of front vowels in the Ao vowel phoneme inventory would ensure that the Chang agentive marker *-er*^{55} is pronounced rather differently by Chungli speakers.

This kind of first language interference is clearly apparent when native speakers of Ao speak Nagamese. The past tense inflection *-se* of Nagamese is pronounced as [ʃi] by native Ao speakers, because the only front vowel available to them is *i*. This in turn triggers the palatalization of the preced-

ing sibilant, just as it does in Ao, resulting in the characteristic output [ʃi]. If Chungli Ao speakers have indeed borrowed the Chang agentive/instrumental marker *-er*^{55} into their dialect, then we can be certain that the phonological limitations of Ao would ensure that its form is phonetically realized as [i]. The retention of the more widespread dental nasal plus central vowel form of the agentive/instrumental marker in Mongsen and the greater geographical distance of Mongsen villages from the Chang-speaking area both suggest that the Chungli innovation results from an intensive language contact situation with Chang.

8. Conclusion

A number of correlations suggestive of convergence through contact have been found across a range of syntactic structures and morphological forms in Mongsen Ao, Chang, Khiamniungan, Nagaland Nepali and Nagamese. The strongest evidence for this is observed in the lingua franca Nagamese, although we see indications of structural borrowing in the opposite direction as well, the typically IA relative-correlative construction found in Mongsen Ao and other TB languages in contact with IA varieties being a prime example.

More specifically, the data leads us to challenge earlier characterizations of Nagamese as a pidgin language. The imperfect learning scenario suggested by Thomason and Kaufman (1988) in the context of language shift appears to best account for the similarity of Nagamese grammar to that of IA languages, while the hypothesis of substratum interference suggests a likely pathway for the calquing of TB morphosyntactic structures by bilingual speakers. There are two major differences to the linguistic situations proposed by Thomason and Kaufman, however. The first is that imperfect learning has not entailed language shift for the vast majority of Nagamese speakers, and the second is that structural borrowing between TB languages, Nagamese and Nepali has occurred in the absence of cultural pressure, since there is no culturally, politically or linguistically dominant stratum extant in Nagaland.

This conclusion assumes that intermittent contact in the context of trade initially resulted in the imperfect learning of Assamese by Naga traders, who then calqued native TB structures to flesh out the structural gaps. In the absence of the standardizing influence of Assamese native speakers, these borrowed grammatical structures gradually became stabilized by successive generations of TB-Nagamese bilingual speakers. Imperfect

learning and substratum interference from TB languages plausibly accounts for a number of divergences of Nagaland Nepali from standard Kathmandu Nepali as well. In support of this, Genetti (1999) proposes that continued imperfect bilingualism could have provided the means by which TB speakers of Nepali in Nepal have lost agreement marking on finite verb stems, similarly noting that these changes have occurred in the absence of language shift.

Notes

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2. Estimates of population figures here and below are based on the Census of India 1991.
3. The Lotha inhabit Wokha district adjacent to the plain of Assam and immediately south of the Ao district of Mokokchung; Sangtam and Yimchungrü villages are found further to the east in neighbouring Tuensang district.
4. 'Sal', so-called because of a distinctive cognate word – *sal*, *san* or *ʧan* – for 'sun' in the languages of this branch. There are some exceptions, however; e.g., the word for 'sun' in Chang is the compound $ʧa^{33}ɲu^{55}$, literally 'mother of light', while in Khiamniungan the equivalent word is $a^{55}ʧɛ^{33}$, a nominalized form of the verb 'to shine'.
5. The distinguishing morphosyntactic characteristics of Nagamese are a simplified pronominal paradigm without honorific distinctions, and the loss of agreement marking on the verb stem – this is levelled out in favour of the third person inflection.
6. This claim is supported by the observation that Hindi speakers from Delhi have little trouble understanding the gist of conversations in Nagamese without prior exposure to the language.
7. A near-phonemic orthography is used for TB language examples. Lexical tones of Mongsen are marked by a grave (low tone), the absence of a diacritic (mid tone) and an acute (high tone) over the vowel of each syllable. Lexical tones of Chang and Khiamniungan are marked by tone letters (after Chao 1930), with 1 representing the lowest pitch and 5 the highest. The orthography used for the Nepali and Nagamese language data follows the orthographical conventions of the South Asian linguistic tradition. The following glosses are used in language examples: 1 first person, 2 second person, 3 third person, ABIL abilitive modality ABL ablative case, ACC accusative case, AGT agentive case, ANAPH anaphoric demonstrative, ANT anterior tense/aspect, AUG augmen-

tative, AUX auxiliary, CAUS causative, CLF classifier, CON conative modality, COND conditional converb, CONT continuative aspect, CVB converb, DECL declarative mood clitic, DEM demonstrative, DESID desiderative, DIST distal demonstrative, DU dual number, EMPH emphatic, EPIST epistemic modality, F feminine semantic gender, FUT future tense, GEN genitive, IMP imperative mood, IN inclusive, INFIN infinitive, INS instrumental case, IRR irrealis mood, LOC locative case, NEG negative, NPST nonpast, NR nominalizer/relativizer suffix, NRL non-relational prefix, NRP nominalizer prefix, ONOM onomatopoeia, PAT patientive case, PFV perfective, PLACE "place" nascent postposition, POSS possessive, PROG progressive aspect, PROX proximate demonstrative, PRS present tense, PST past tense, PTCL particle, PTCP participle, Q interrogative, RES resultant state marker, SG singular number, SP species, TOP topic particle.

8. All animals are personified as having feminine semantic gender in Ao folktales, even when the referent is obviously of masculine gender.
9. Phonemes that are subject to phonological processes of deletion in the word internal environment are henceforth enclosed by parentheses in language examples.
10. I am grateful to Priyankoo Sarmah for bringing this to my attention.
11. As Dravidian languages similarly lack relative pronouns, they were driven by the same functional need to use interrogative pronouns after the relative-correlative construction was borrowed from IA. We see an identical motivation in the use of interrogatives as relative pronouns in relative-correlative constructions borrowed into TB languages.
12. The fact that this relative-correlative construction happens to be lacking an overt "relative" clause head in the matrix clause has no bearing on the analysis.

References

Acharya, Katti Panduranga
1983 *Lotha grammar*. Mysore: Central Institute of Indian Languages.

Bickel, Balthasar
1993 Belhare subordination and the theory of topic. In *Studies in Clause Linkage: Papers from the First Köln-Zürich Workshop,* Karen H. Ebert (ed.), 23–55. Zürich: Arbeiten des Seminars für Allgemeine Sprachwissenschaft.
1998 Review article: Converbs in cross-linguistic perspective. *Linguistic Typology* 2 (3): 381–397.

Bigge, H.
1969 Reprint. Dispatch from Lieutenant H. Bigge, Assistant Agent, detached to the Naga Hills, to Captain Jenkins, Agent Governor-

General, N.E. Frontier, communicated from the Political Secretariat of India to the Secretary to the Asiatic Society. In *The Nagas in the Nineteenth Century*, Verrier Elwin (ed.), 227–232. London: Oxford University Press. Original publication, Journal of the Asiatic Society of Bengal., 1841, Vol X, Pt, 1: 129–136.

Bradley, David

1996 Nepali as a lingua franca. In *Atlas of Languages of Intercultural Communication in the Pacific, Asia and the Americas* Vol. 2.1., Steven A. Wurm, Peter Mülhaüsler, and Darrell T. Tryon (eds.), 763–772. Berlin/New York: Mouton de Gruyter.

Burling, Robbins

1983 The sal languages. *Linguistics of the Tibeto-Burman Area* 7 (2): 1–32.

2003 The Tibeto-Burman languages of north-east India. In *The Sino-Tibetan Languages,* Graham Thurgood, and Randy J. LaPolla (eds.), 169–191. London: Routledge.

Chao, Yuen Ren

1930 A system of tone letters. *Le Maitre Phonetique* 30: 24–27.

Coupe, Alexander R.

2003 The Mongsen dialect of Ao: A language of Nagaland. Ph.D. diss., La Trobe University.

forthc. *A Grammar of Mongsen Ao*. (Mouton Grammar Library 39.) Berlin/New York: Mouton de Gruyter.

Emeneau, Murray B.

1956 India as a linguistic area. *Language* 32 (1): 3–16.

Genetti, Carol

1999 Variation in Agreement in the Nepali Finite Verb. In *Topics in Nepalese Linguistics*, Yogendra P. Yadava, and Warren W. Glover (eds.), 542–555. Kathmandu: Royal Nepal Academy.

Gumperz, John J., and Robert Wilson

1971 Convergence and creolization: A case from the Indo-Aryan/ Dravidian border in India. In *Pidginization and Creolization of Languages*, Dell Hymes (ed.), 151–167. London: Cambridge University Press.

Haiman, John

1978 Conditionals are topics. *Language* 54 (3): 564–589.

Haspelmath, Martin, and Ekkehard König (eds.)

1995 *Converbs in Cross-Linguistic Perspective*. Berlin/New York: Mouton de Gruyter.

Hildebrandt, Kristine A.

this vol. Tone in Bodish languages: Typological and sociolinguistic contributions

Mackenzie, Alexander
1995 Reprint. *The North-East Frontier of India*. New Delhi: Mittal Publications. Original edition titled *History of the Relations of the Government of with the Hill Tribes of the North-East Frontier of Bengal,* Calcutta: Home Department Press, 1884.
Masica, Colin P.
1976 *Defining a Linguistic Area*. Chicago: University of Chicago Press.
1991 *The Indo-Aryan Languages*. Cambridge: Cambridge University Press.
Morris, C. John
1936 *Handbook for the Indian Army: Gurkhas* (2nd revised edition). New Delhi: Government Printer.
Nadkarni, Mangesh V.
1975 Bilingualism and syntactic change in Konkani. *Language* 51 (3): 672–683.
Shakespear, Leslie Waterfield
1980 Reprint. *The History of the Assam Rifles*. Gauhati: Spectrum Publications. Original edition, London: Macmillan, 1929.
Thomason, Sarah Grey, and Terrence Kaufman
1988 *Language Contact, Creolization, and Genetic Linguistics*. Berkeley: University of California Press.

The many faces of subordination, in Germanic and beyond

Jean-Christophe Verstraete

1. Introduction

In the most general terms, subordination refers to structural asymmetry within a complex sentence, between a main clause that is structurally equivalent to an independent clause and a subordinate clause that is structurally distinct from independent clauses. While it is relatively easy to define the concept in general terms, the precise nature of the asymmetry involved is not so easy to pin down. There is a whole range of formal phenomena that have been associated with subordinate asymmetry, like conjunctions, verb forms or word order types not found in main clauses, and there is a similar variety of functional generalizations, including backgrounding, non-assertion or integration. It is not clear at all whether all of these phenomena really refer to one and the same thing.

In this paper,[1] I will present an analytic approach to the typology of subordinate constructions, showing that subordination covers at least two distinct types of asymmetry within the complex sentence: asymmetry in the internal structure of the subordinate clause, and asymmetry in the external relation between main clause and subordinate clause. In Section 2, I will outline the basic arguments for distinguishing between these two types, using evidence from English and other Germanic languages. I will focus especially on how this approach can help to sort out some conflicting formal and functional generalizations associated with subordination in the literature. In Section 3, I will demonstrate the usefulness of the proposal beyond the analysis of Germanic languages, by focusing on one of the phenomena traditionally associated with subordination, the use of specific verb forms in subordinate clauses. Specifically, I will show how the analysis can explain the distribution of mood forms in subordinate clauses, and how it can help to elucidate the semantic relation between main clause uses and subordinate uses of mood. The argument will be exploratory, based mainly on my own work on mood in Australian languages, but its typological value lies in the way it can account for subordinate uses of mood that remain unexplained or even undescribed in the literature.

2. Subordination in a well-known language

Even for a well-described language like English, the nature of subordination is not particularly clearly defined. There are a number of conflicting formal criteria to define subordinate clauses, like the potential to move to the front of the main clause (Quirk et al. 1985: 926–927), the potential to occur in cleft constructions (Quirk et al. 1985: 1071–1072), or the availability of "main clause phenomena" like negative adverb preposing (Emonds 1970). If we look at a set of conjunctions like *after*, *whereas* and *but*, for instance, these criteria produce conflicting categorizations: *after* and *whereas* are subordinate and *but* is coordinate on the first criterion, while *after* is subordinate and *whereas* and *but* are coordinate on the second and third criterion, as illustrated for the first two criteria in examples (1a–i).

(1) English (Indo-European, Germanic; constructed examples)
   a. *We picked up Peter after the show finished.*
   b. *After the show finished, we picked up Peter.*
   c. *It was after the show finished that we picked up Peter.*
   d. *Peter loved the show, whereas Mary hated it.*
   e. *Whereas Mary hated it, Peter loved the show.*
   f. **It is whereas Mary hated it that Peter loved the show.*
   g. *The show had finished, but Peter was not there.*
   b. **But Peter was not there, the show had finished.*
   i. **It is but Peter was not there that the show had finished.*

There is a similar lack of clarity about the functional generalizations found in the literature: subordinate clauses have been said to be "non-asserted" (Keenan 1971: 46–47; Winter 1982), i.e., not put up for debate in the exchange between speaker and interlocutor, "backgrounded" (Townsend and Bever 1977; Tomlin 1985), i.e., providing information that does not belong to the central thematic line of the exchange, or "integrated" (Jespersen 1924: 103–106; Brøndal 1972: 26–27), i.e., part of the proposition described in the main clause. Again, these definitions lead to conflicting categorizations: the availability of cleft constructions and the ban on main clause phenomena point towards integrated and non-asserted status for *after*-clauses, in contrast with *whereas*- and *but*-clauses, but the availability of positional mobility for *whereas*-clauses groups them as backgrounded together with *after*-clauses, in contrast with *but*-clauses.

One way to make sense of such conflicting categorizations is to recognize the existence of different types of structural asymmetry within a complex sentence, i.e., different types of subordination. As argued in a number of functionally oriented approaches to clause combining (e.g., Bossong 1979; Foley and Van Valin 1984; Hengeveld 1998; Cristofaro 2003), the most basic functional difference between a main clause and a subordinate clause relates to their illocutionary structure: subordinate clauses differ from coordinate clauses and simple main clauses in that they do not represent full speech acts. Thus, a subordinate construction consists of a main clause that represents a full speech act, and an associated subordinate clause that does not. While I agree with this basic insight, I would like to add here that there are two structurally distinct loci where the illocutionary structure of the complex sentence can be affected: the internal illocutionary structure of the subordinate clause, and the external relation of the subordinate clause to the illocutionary structure of the main clause.

If we go back to our set of conjunctions in (1), the distinction between the two types can be illustrated as follows. What distinguishes *but* from *after* and *whereas* is that the *but*-clause has an illocutionary structure of its own, as reflected in the availability of a full paradigm of illocution markers, i.e., declarative in (1a), interrogative in (2a), and imperative in (2b). Clauses introduced by *after* and *whereas*, by contrast, are restricted to declarative, and do not allow interrogative or imperative, as shown in (2c–f). What this implies in functional terms is that declaratives in *after*- and *whereas*-clauses do not mark assertive illocution, as they would in normal main clauses, but simply reflect an unmarked value to which the paradigm of illocution marking reverts in contexts where illocution is neutralized.

(2) English (Indo-European, Germanic; constructed examples)
   a. *The show had finished, but where was Peter?*
   b. *The show had finished, but don't even think Peter showed up.*
   c. **We picked up Peter after did/didn't the show finish?*
   d. **Peter loved the show, whereas did/didn't Mary hate it?*
   e. **We picked up Peter after finish the show.*
   f. **Peter loved the show, whereas remember Mary hates shows.*

In other words, the *after*- and *whereas*-clauses differ from the *but*-clause in that they do not have any illocutionary value of their own. There is further comparative evidence for this analysis in the fact that other Germanic languages like German, Dutch or Danish do not even use a formally de-

clarative structure in the equivalents of the *after*- and *whereas*-clauses, but switch to a wholly distinct type of word order (see further in Verstraete 2004). The Dutch equivalent of the *after*-clause, for instance, uses an OV type of word order that is distinct from the normal VO word order found in declaratives, interrogatives and imperatives, as illustrated in the contrast between (3a) and (3b). The use of a specific word order type outside the paradigm of illocution markers further confirms the fact that the apparent declarative in the English equivalent does not mark assertion.

(3) Dutch (Indo-European, Germanic; constructed examples)
   a. *Jan had de wedstrijd ge-won-en.*
      Jan have.PST DEF race PTCP-win.PST-PTCP
      'Jan had won the race.'
   b. *na-dat Jan de wedstrijd ge-won-en had.*
      after-COMP Jan DEF race PTCP-win.PST-PTCP have.PST
      '… after Jan had won the race.'

Apart from the internal structure of the subordinate clause, there is another type of illocutionary asymmetry within complex sentences: subordinate clauses can also be part of the illocutionary structure of their main clause. This is the case for *after*-clauses, as reflected in the fact that they can serve as the focus of illocutionary modifications in the main clause, with the main clause as a presupposition. In the interrogative in (4a), for instance, the *after*-clause serves as the focus of the question, and the main clause as its associated presupposition. Effectively, this type of structure has one single illocution, presupposing that Peter was picked up and asking when this happened. *Whereas*- and *but*-clauses, by contrast, are separate from the illocutionary structure of their main clause, as reflected in the fact that they cannot serve as the focus of illocutionary modifications in their main clause, illustrated with the interrogative main clauses in (4b–c).

(4) English (Indo-European, Germanic; constructed examples)
   a. *Did you pick up Peter after the show finished? [or before …]*
   b. ?*Did Peter love the show whereas Mary hated it?*
   c. ?*Had the show finished, but Peter was not there?*

At first sight, this "integrated" type of subordination may look like the category of cosubordination proposed by Foley and Van Valin (1984: 239–244), who also use illocutionary scope as a criterion to distinguish it from

coordination. There is one crucial difference, however: the defining feature of cosubordination, illustrated in the clause chaining structure from Amele in (5), is that the cosubordinate clause lacks formal marking of illocution, but functionally shares it with an associated clause that does mark it formally. Thus, the interrogative marker *fo* associated with the main verb *qoiga* in (5) also applies to the cosubordinate verb *busaleceb*, resulting in a construction that consists of two interrogatives.

(5) Amele (Trans-New Guinea, Madang; Roberts 1988: 52)
Ho busale-ce-b dana age qo-ig-a fo
pig run.out-DS-3SG man 3PL hit-3PL-TOD.PST QU
'Did the pig run out and did the men kill it?'

In this sense, cosubordinate constructions are entirely different from the "integrated" type of subordination discussed here, and are really a variant of the coordinate category (see also Roberts 1988: 50–58). Cosubordinate constructions like (5) consist of two speech acts, while constructions like (4a) consist of one single speech act: there is only one question in (4a), asking about the time when Peter was picked up and presupposing that he was picked up. In addition, the type of scope involved in the two constructions is different (see also Tikkanen 1995: 506–508): in (5), the interrogative marker in the main clause marks the main and the cosubordinate clause as interrogative, while in (4a), the interrogative marker only marks the main clause as interrogative, and does not make the subordinate interrogative.

It will be obvious that the two types of illocutionary asymmetry discussed here are not unrelated: a clause cannot be integrated into the illocution of its main clause while retaining its own illocution. This implies that the two types of asymmetry define three construction types, represented by the three conjunctions discussed here (see Verstraete 2004 on other English conjunctions). The *but*-type is the traditional coordinate construction, with two clauses that have their own illocutionary force. The *after*-type and the *whereas*-type are two types of subordinate clauses, which lack an illocutionary structure, but which can either be integrated into the illocution of the main clause or not. In what follows, I will refer to subordination based on illocutionary neutralization as I-subordination (internally subordinate clause), and to subordination based on illocutionary integration as E-subordination (externally subordinate clause).

Table 1. Types of complex sentences

	Coordination e.g., *but*	I-subordination e.g., *whereas*	E-subordination e.g., *after*
Illocutionary neutralization	–	+	+
Illocutionary integration	–	–	+

The advantage of this classification is threefold. First, it allows us to make sense of the conflicting formal and functional categorizations found in the literature, because these can now be regarded as reflections of different aspects of the illocutionary structure of the complex sentence. Functionally, notions like "integration" can be further specified as illocutionary integration, and notions like "backgrounding" or "non-assertion" can be further specified as illocutionary neutralization. Formally, conflicting criteria like clefting and preposing can each be assigned to one of the two types: clefting is a reflection of illocutionary integration, while preposability is a reflection of illocutionary neutralization (see Verstraete 2004 for more detailed arguments). Secondly, the proposed classification makes sense of these conflicts in a principled way: it uses one basic functionally motivated criterion, viz. illocutionary asymmetry, and shows how this can affect complex sentences in two different ways, leading to alternative categorizations. Thirdly, the proposed criteria and the resulting categorization are also useful beyond the analysis of Germanic languages, as I will show in the following section.

3. Subordination elsewhere: Focus on finite verbs

One of the phenomena traditionally associated with subordination cross-linguistically is the use of verb forms that are not typically found in main clauses. In this section, I will show how the analysis can help to make sense of the distribution and interpretation of such verb forms. I will focus on finite subordinate forms, which have received less attention in the literature. Non-finite verb forms have been dealt with in in-depth studies like Roberts (1988) on clause chaining, Koptjevskaja-Tamm (1993) on nominalization, Haspelmath and König (eds. 1995) on converbs, and Cristofaro (2003) on non-finite forms in general. The analysis will be exploratory rather than exhaustive, dealing mainly with data from Australian languages, but its typological value lies in the way it explains uses that are neglected in the literature, and that do not fit into current accounts of subordination.

3.1. Mood categories as finite subordinate forms

Many languages have finite verb forms that typically occur in subordinate contexts, often labelled "subjunctive" or "irrealis" in reference grammars. What makes these categories particularly interesting from our perspective is that they are not absolutely restricted to complex sentence contexts, but usually also have some uses in independent clauses, often in the modal domain. Moreover, in subordinate clauses they typically occur in specific semantic types, like condition, purpose, manipulation, volition or intention (see Givón 1994 and Palmer 2001: 107–144 for a fuller overview). This has led a number of authors, like Givón (1994), to assign a common core meaning of "non-realization" to these categories, covering both the subordinate uses and the modal uses in independent clauses. While this is a reasonable approximation of a schematic description, it leaves a number of questions unanswered about the precise range of mood categories within the subordinate domain, and the nature of the relation between their subordinate and main clause uses. Within the framework developed here, I will argue that there are two types of mood use in subordinate clauses, corresponding to the two general types of subordination described in the previous section: mood as a reflection of illocutionary neutralization in I-subordination, and mood as a reflection of illocutionary integration in E-subordination. I will show that this distinction allows us to explain the existence of hitherto neglected categories of mood use in subordinate clauses, and that it also helps us to elucidate the relation between subordinate and independent uses of mood categories.

To give an initial idea of the range of phenomena covered by finite subordinate forms, I will first discuss three example languages, which illustrate three logical possibilities in the distribution of mood in subordinate clauses. The English examples from the previous section illustrate a first type, in which finite subordinate forms are formally identical to finite verbs in standard main clause assertions (though, as argued above, their paradigmatic status is different). In a second type, a subset of finite subordinate clauses, usually a semantically definable class, use verb forms that are not used in standard main clause assertions, while other subordinate clauses use the normal finite forms also found in assertions. An example is Ndjébbana (McKay 2000), in which constructions like time clauses or complements of perception verbs take realis verbs, as in the time clause in (6a), while constructions like conditional clauses and complements of manipulation verbs take irrealis verbs (McKay 2000: 308–312), as in the conditional in (6b) and the complement in (6c). In independent contexts, realis verbs are found

in assertive main clauses, as in the main clause of (6a). Irrealis verbs are found in modalized clauses, expressing volition, exhortation or counterfactuality (McKay 2000: 228–229), as in the main clause of (6c), where it marks participant volition.

(6) Ndjébbana (Australian, Ndjébbana; McKay 2000: 311, 312, 309)

a. *ka-ngaḍjí-na* *ngabúyanga* *nga-yarrárlma-nga*
3MIN.M-speak-REM 1MIN.DAT 1MIN.S-grow-REM
'My father told me about this when I had grown up.'

b. *márdba* *dja-ka-bbándja* *djé-yarra*
neck 2MIN.A.3MIN.O-IRR-put 2MIN.S.IRR-go.FUT
dja-kkóndja *mardírrbala*
2MIN.A.3MIN.O.IRR-cut.FUT mosquito
dja-ka-mó[ya]-yana
3MIN.A.2MIN.O-IRR-bite.FUT-3MIN.M.DAT
'If you want to go and cut it mosquitoes will bite you.'

c. *mudíkkang* *márdba* *dja-ka-bbándja*
vehicle neck 2MIN.A.3MIN.O-IRR-put.FUT
yí-yarra *dja-ka-na*
1/2MIN.S.IRR-go 2MIN.A.3MIN.O-IRR-see
'Would you like to take me in your truck to see [the dreaming place]?'

In a third type, all finite verbs in subordinate clauses are different from finite verbs in main clause assertions. This is the case, for instance, in Gooniyandi, where finite subordinate clauses are either in the factive mood or in the subjunctive mood (McGregor 1988, 1990: 431–435): factive is found with past temporal clauses, as in (7a), and subjunctive is found in conditionals, clauses of reason, and future temporal clauses, as in the conditional clause in (7b). Neither mood is used in standard assertive main clauses: subjunctive mood is used in modal contexts comparable to irrealis in Ndjébbana, while factive mood is used in statements of the obvious, or to establish a setting or reach a conclusion at the beginning and end of stories, as in (7c) (McGregor 1990: 544–556).

(7) Gooniyandi (Australian, Bunuban; McGregor 1990: 434, 433, 556)
a. *nganyi ngirndaji-ya bij-gila-larni mangaddi*
I this-LOC arrive-FACT-1SG.S.VCLF not
ngaddawangindimi
I:was:knowing:them
'When I got there, I didn't know anyone.'
b. *thiddoo galyjini gidda-ya-woomi*
kangaroo fast run-SBJV-FUT.3SG.S.VCLF
mangaddi nyag-goowa-woolooni
not spear-PROG-FUT.1SG.S.VCLF
'If the kangaroo runs fast, I won't be able to spear it.'
c. *dagooddwani yilba warang-gila-ari*
it:entered forever sit-FACT-PRS.3SG.S.VCLF
'He went into (his hole) and has been there ever since.'

3.2. Mood and I-subordination

If we compare these three languages, it is obvious that there is a basic distinction between constructions involving unrealized events like the conditionals in (6b) and (7b) and the complement in (6c), and constructions involving realized events like the temporal clauses in (6a) and (7a). Constructions with unrealized events typically have special moods, as in (6b–c), (7b), while constructions with realized events only occasionally have special moods, as in (7a). In the literature, the link between subordinate moods and unreality has often been noticed, and generalized in terms of a schematic meaning of non-realization for subjunctive-like moods, as in Givón (1994), while the link with realized events has not often been discussed. The best-known exceptions to a generalized link between subordinate moods and unreality include the use of subjunctive moods in concessive clauses in several Romance languages (e.g., Palmer 1986: 187–188) and its more widespread use in some non-past temporal clauses (e.g., Givón 1994: 288–297). As argued in Givón (1994), however, most of these cases can in principle still be explained in terms of a scalar re-definition of non-realization. Even if past and non-past temporal and concessive clauses all presuppose realization, realization is still less certain for non-past events, and accordingly this is also where we tend to find subjunctives (see Givón 1994: 288–297; Palmer 1986: 187–188). For past temporal clauses, by contrast, this scalar approach cannot be used: whatever definition one uses for non-realization, clauses like (7a) are the most certain type of realized

clauses, and therefore constitute a genuine problem for a generalization in terms of non-realization.

From the perspective of the analysis proposed here, however, cases like (7a) are not strange at all, and can easily be grouped together with conditional constructions: both involve the illocutionary neutralization that is typical of I-subordination. What the factive mood in the Gooniyandi temporal clause in (7a) has in common with the irrealis mood in Ndjébbana and Gooniyandi conditional clauses like (6b) and (7b), is that in both cases the mood-marked clause does not represent a speech act, for different reasons. In the former case, the event in the temporal clause is presupposed – i.e., taken for granted – rather than asserted, while in the latter case, the event in the conditional clause is supposed – i.e., regarded as hypothetical – rather than asserted. In either case, the speaker does not put forward the event described in the subordinate clause as an assertion, i.e., something that can be affirmed, denied or modalized in the on-going exchange, but rather as the temporal background to another event, as in (7a), or as an entry into a hypothetical world, as in (6b) and (7b).

The different motivations for illocutionary neutralization can also explain the differences in mood use. Contexts of presupposition are closer to assertion than contexts of supposition, since presupposition and assertion both involve a basic commitment to the truth of the proposition, whereas supposition by definition does not. In this perspective, it is not unexpected for presupposed clauses to use the finite forms found in standard assertions, and for supposed clauses to use mood forms associated with modalized clauses that involve modifications of the speaker's commitment to the truth. If presupposed clauses do use a special mood form, like the factive in Gooniyandi, this is not a modal category modifying speaker-commitment in main clauses. Thus, the Gooniyandi factive mood is distinct from the subjunctive in that it does not have any specific modal uses in main clause contexts. McGregor (1990: 554–555) provides a general gloss of "it is a fact that …", and argues that the factive is used in stating the obvious, and also has a function in text structure, describing a "starting point" at the beginning of narratives or a "permanent conclusion" at the end. These independent uses are clearly in line with the subordinate uses of the factive mood: in both cases, factive-marked main clauses do not present events the speaker wants to put up for debate in the on-going interaction, but rather events that are presented as being agreed upon between speaker and hearer.

To conclude, then, from the perspective chosen here, the use of factive mood in temporal clauses like (7a) is not unexpected, and is really a reflection of the same principle that governs the use of mood in more typical

contexts like conditional clauses. The use of special mood forms in subordinate clauses reflects illocutionary neutralization, and the types of mood being used reflect the different motivations for illocutionary neutralization. Subordinate clauses lack illocutionary force because they present presupposed events (in which case they use mood types used for backgrounding in main clauses), or because they present hypothetical events (in which case they use mood types used to modify speaker-commitment in main clauses).

3.3. Mood and E-subordination

An explanation in terms of illocutionary neutralization upsets the traditional picture of mood use in subordinate contexts, because it groups together subordinate clauses involving supposition with those involving presupposition, and thus replaces an explanation in terms of non-realization. One possible objection is that there are other types of subordination involving non-realized events that cannot be dealt with in terms of supposition, like purpose clauses, or various types of complements to verbs of volition, manipulation and intention. In this section, I will show that such constructions are actually instances of what I have identified as the second type of subordination in this paper, viz. E-subordination, and that the use of mood in E-subordination is semantically distinct from mood use in I-subordination as discussed in the previous section.

The difference from the types discussed in the previous section is clearest with complement constructions like the one illustrated in the protasis of the conditional construction in (6b) above, repeated as (8a). In this particular example, there are three instances of irrealis mood: there is the irrealis in the idiom ‘neck-put’ (meaning ‘like’), associated with the conditional relation, and there are the two instances of irrealis marked on the verbs ‘go’ and ‘cut’, associated with the complement relation to the verb ‘like’. The difference between the two lies in the way the subordinate use of the mood relates to its main clause uses. In main clause contexts, irrealis is used to refer to future events, and to events desired by the speaker or a clause participant (McKay 2000: 228–229), as illustrated in (8b) for speaker’s desire.

(8) Ndjébbana (Australian, Ndjébbana; McKay 2000: 312, 287)

a. *márdba* *dja-ka-bbándja* *djé-yarra*
neck 2MIN.A.3MIN.O-IRR-put 2MIN.S.IRR-go.FUT
dja-kkóndja *mardírrbala*
2MIN.A.3MIN.O.IRR-cut.FUT mosquito
dja-ka-mó[ya]-yana
3MIN.A.2MIN.O-IRR-bite.FUT-3MIN.M.DAT
'If you want to go and cut it mosquitoes will bite you.'

b. *dílkara* *ngí-ya-na* *ngí-ya-na*
moon 1/2UA.A.3MIN.O-IRR-see 1/2UA.S-IRR-sit
'Let's look at the moon (to determine timing).'

In the complement construction, the subordinate use of mood can be regarded as semantically identical to the main clause use: one can simply plug the semantics of main clause irrealis into the complement construction to obtain the right interpretation. The reason is that in the complement construction, the subordinate clause is integrated into the illocution of the main clause, as a complement of the main verb 'like': the whole construction constitutes one single interrogative speech act. In this type of constellation, there is a source within the construction to which the modal semantics of the irrealis mood can be bound: the agent of the idiom 'like' in the main clause in (8a) is also the one who desires the realization of going and cutting at the dreaming place.

In other words, the meaning of desired realization associated with the irrealis mood in main clauses (as in 8b) is simply replicated in subordinate clauses, but instead of binding the modal attitude to the speaker, as is the default in main clause contexts, the integration into the main clause makes a participant of the main verb available as a secondary target for binding modal attitudes. Thus, the complement relation and the main clause semantics of the irrealis mood can be combined to produce the right interpretation ($agent_i$ wants [$desired_i$ realization of X]), and the main clause uses and the complement uses of the mood can be dealt with as one single category. In this sense, the subordinate use is semantically identical to the main clause use, but with responsibility for the modal attitude relegated to a participant in the main clause rather than to the speaker.

With the conditional relation, by contrast, this is not possible: one cannot plug the main clause meanings of future event, speaker-desired event or participant-desired event into the conditional structure in (8a) and arrive at the right interpretation. In the absence of any alternative source within the construction, these meanings would have to be bound to the speaker, which

would result in a juxtaposition of modalized events rather than a conditional. In this sense, the main clause uses and the conditional uses of the irrealis mood cannot be described in terms of a unitary meaning: they share a schematic feature of "lack of commitment to truth status", but for the rest the conditional use must be regarded as a semantic extension rather than the same meaning in a different construction. The reason is that conditional structures are I-subordinated, but not E-subordinated: the subordinate clause is not integrated into the main clause, and therefore the mood cannot be linked to any participant in the main clause.

3.4. E-subordination in between complement and adverbial clauses

Complement constructions like the ones described above are the most obvious application of E-subordination in the analysis of mood, but the distinction between I-subordination and E-subordination is actually useful in other constructions as well, including a range of adverbial constructions. In complement constructions, the main clause contains a predicate explicitly describing the modal attitude expressed in the subordinate clause, like the verb of volition in (8a), whose subject can then be taken as the source of the attitude. What the framework proposed in this paper can add is that links to a participant in the main clause are not just associated with the presence of predicates explicitly describing the participant's modal attitudes, but with E-subordination more generally.[2] More specifically, I will show that the same type of integration is also found in subordinate constructions beyond the domain of complementation, like finite clauses of purpose, apprehension, reason and intended endpoint. All of these constructions are adverbial in the sense that they do not serve as a complement of the verb in the main clause, but what distinguishes them from other adverbial clauses and what links them with complement clauses is their integration into the main clause: they all have a special link to a participant of the main clause. In this section, I will argue that this also implies that they show the same mood phenomena as the complement constructions described in the previous section.

The relevance of E-subordination, and the link to the participant of the main clause, can easily be demonstrated by contrasting purpose, reason and intended endpoint with their pure adverbial counterparts, i.e., result, cause and simple endpoint. Before going on to the relevant formal evidence, I will first outline the semantic argument using examples from English. The two constructions in (9a–b) represent semantic relations of purpose and

result, respectively. What they have in common is that in both cases the event described in the main clause enables a subsequent event described in the secondary clause.

(9) English (Indo-European, Germanic; constructed examples)
   a. *He left the back door open so that the plumber could get in.*
   b. *He left the back door open, so (that) the burglars had no difficulty getting in.*

What distinguishes these two closely related constructions, however, is the way this enabling relation involves the participants in the main clause, as also argued in Palmer (1987). In the purpose construction in (9a), the event in the secondary clause is intended by the agent of the main clause, while there is no such relation of intention in the result construction in (9b).

A similar semantic feature can be used to distinguish constructions of reason, as in (10a), from constructions of cause, as in (10b). Again, both constructions have a basic semantic core in common: in both cases the event in the secondary clause is the cause of the event in the main clause.

(10) English (Indo-European, Germanic; constructed examples)
   a. *Julia killed her husband because he cheated on her.*
   b. *Julia arrived late because she was stuck in a traffic jam.*

As with the previous set of constructions, there is one single feature that distinguishes these two constructions, which can again be described in terms of the way the causal relation involves the agent of the main clause, as also argued in Bolkestein (1991) and Hengeveld (1998: 344–347). In the reason construction in (10a), the event in the secondary clause is not just a cause for the event in the main clause, but it represents the personal motivation of the agent of the main clause. In the causal construction in (10b), on the other hand, there is no such involvement of the main clause's agent: the traffic jam did not make her decide to be late, but was just an accidental circumstance that resulted in her being late.

Constructions that denote an endpoint, finally, show the same kind of distinction between relations that involve the agent's intentions and those that do not. Both in (11a) and (11b), the secondary clause denotes the endpoint of the event described in the main clause.

(11) English (Indo-European, Germanic; constructed examples)
   a. *The student re-worked the essay until the teacher passed him for the course.*
   b. *The student re-worked the essay until time was up and he had to hand it in.*

Again, however, the agent's intentions make the distinction. In (11a), the event in the secondary clause is intended as a break-off point by the agent of the main clause, whose goal in re-working the essay is to be passed for the course. In (11b), on the other hand, the event of the secondary clause is an incidental break-off point, not in any way intended by the agent of the main clause but simply interrupting the re-working of the essay.

These semantic contrasts show that finite clauses of purpose, reason and intended endpoint are instances of E-subordination just like the complement constructions discussed in the previous section, and that mood use in these contexts can be treated accordingly. If a language uses mood in one of these subordinate clauses, it is bound to a participant in the main clause rather than to the speaker, just like in complement clauses. There is interesting formal evidence for this in the fact that in some languages the conjunctions used in these constructions are shared with or formally related to the complement domain, especially constructions of represented speech, which are specialized in explicit links to the main clause agent (see Ebert 1991; Heine and Kuteva 2002: 265–267). In Lezgian (Haspelmath 1993), for instance, one way to encode reason and purpose is to use the conjunction *luhuz*, which has as its "original meaning 'saying/having said'" (Haspelmath 1993: 390). Thus, the clause of reason in (12), which represents the old woman's personal motivation for putting the lock on the door, is not related to the main clause by a conjunction specific to reason or some related semantic domain, but rather by *luhuz*.

(12) Lezgian (Nakh-Daghestanian, Lezgic; Haspelmath 1993: 391)
   a ɋari.di zun kaka-jar čünüx-iz ata-nwa-j-di
   that old.woman(ERG) I:ABS egg-PL steal-INF come-PRF-PTCP-SBZ
   ja luhuz rak'-ar.a-l čefte hald-na
   COP saying door-PL-SRESS lock put.on-AOR
   'That old woman put the lock on the door because [she thought that] I had come to steal the eggs.'

We find similar cases in our Australian data. In Ngiyambaa (Donaldson 1980), for instance, purpose constructions under different-subject conditions typically contain both a deontic mood (purposive) and a conjunction glossed as "linguistic evidence", illustrated in (13).

(13) Ngiyambaa (Australian, Pama-Nyungan; Donaldson 1980: 284)
maying-gu wi: bangiyi
person-ERG fire[ABS] burn.PST
girbadja-dha=lu wirring-girri
kangaroo[ABS]-LINGEVID=3ERG cook-PURP
'The person burnt a fire so that she could cook a kangaroo.'

The function of the conjunction suffix here is to "make it the expressed personal intention of the subject or agent of the first clause … that the event indicated by the second clause must take place" (Donaldson 1980: 285). This way, the combination of mood and conjunction provides a transparent reflection of the composite nature of these constructions: the deontic mood introduces a modal feature into the subordinate clause, and the conjunction links this back to the agent of the main clause, which together produce a purposive interpretation.

Another example comes from Mparntwe Arrernte (Wilkins 1989), where the intended endpoint construction uses a proprietive marker, as in (14).

(14) Mparntwe Arrernte (Australian, Pama-Nyungan; Wilkins 1989:196)
re artne-pe-kwete-artne-ke, m-ikwe
3SG.S cry-FREQ-still-RDP-PST.COMPL mother-3.KINPOSS
petyalpe-tyeke-kerte.
come.back-PURP-PROP
'He kept on crying until his mother returned.'

The general function of this marker is to mark control, i.e., in a construction in which X relates to Y-*kerte*, it is the case that "What Y does is what X wants it to do" (Wilkins 1989: 196). In this sense, the proprietive serves to link back the mood used in the subordinate clause to the agent of the main clause, from whose perspective the mother's return is desired.

Thus, what these examples show is that the domain of E-subordination is not restricted to complement constructions, but also includes adverbial constructions like finite clauses of purpose, reason and intended endpoint. Mood use in these subordinate clauses can easily be unified with independ-

ent uses of mood, in the sense that the modal attitude marked by the mood is assigned to a participant in the main clause rather than to the speaker. Note that, just like with I-subordination, this analysis challenges the traditional account of subordinate mood in terms of unreality. The event described in the clause of intended endpoint in (14), for instance, is realized, yet the structure uses a mood category that has modal uses in main clauses, specifically desired realization of an event. This cannot be explained under the unreality view, but it can be explained in terms of E-subordination, because the relevant entity for the binding of modal attitudes is not the speaker (from whose perspective the events are indeed realized), but a participant in the main clause (from whose perspective they are not).

4. Conclusion

The basic argument developed in this paper is that it is necessary to distinguish between two different types of subordination, reflecting different types of illocutionary asymmetry within the complex sentence. In I-subordination, the subordinate clause lacks internal illocutionary structure, while in E-subordination, the subordinate clause is integrated into the illocutionary structure of the main clause. Distinguishing between these two types allowed us to sort out a few puzzles in the analysis of subordination, both in formal and in functional terms.

On the formal side, it was shown that the distinction can make sense of conflicting formal criteria for subordination, like positional mobility versus clefting in Germanic languages. In addition, it can also predict and explain the distribution of subordinate mood forms, including those referring to realized events, where traditional accounts of mood run into difficulties. On the functional side, it was shown that the distinction could make sense of conflicting functional accounts of subordination, like non-assertion versus integration, and that it could tease apart seemingly similar uses of mood in subordinate clauses, by showing how the semantic relation of mood in E-subordination to main clause uses differs from that in I-subordination.

If we look beyond the domain of complex sentences, the analysis proposed here is also relevant to our understanding of mood categories more generally. The analysis is preliminary, in the sense that it does not deal with a representative sample of languages, but it provides a promising hypothesis for further typological work, in that it covers not only the typical uses of mood in irrealis contexts, but also the more problematic uses in realis contexts, like temporal clauses or intended endpoint clauses. While other mod-

els resort to non-categorical solutions (like Givón's 1994 scalar definition of unreality) to deal with such cases, the present study can deal with these in a more straightforward way. By focusing on the functional basis of the subordinate constructions that use mood, the analysis proposed here can explain such unexpected uses of mood, either as a reflection of illocutionary neutralization or as a reflection of illocutionary integration and the associated binding of the mood category to a participant in the main clause.

Table 2. Alternative accounts of mood use in subordinate clauses

Types	Alternative accounts		Use of mood
	Reality status	Subordination	
Temporal	Realized	I-subordination (presupposition)	+ (factive)
Conditional	Unrealized	I-subordination (supposition)	+ (subjunctive)
Unreal complement	Unrealized	E-subordination	+
Purpose, reason, intended endpoint	Either	E-subordination	+

Table 2 summarizes the argument about the typology of mood and subordination developed in this paper. The second column represents the traditional approach, which relates mood use to the reality status of the subordinate clause. The third column represents the alternative approach developed here, which shows that mood use in subordinate contexts can be predicted more accurately by looking at the different types of subordination and their functional basis than by looking at the reality status of the subordinate clause.

Notes

1. I am grateful to Barbara De Cock, to two anonymous reviewers and to the editors of this volume for very useful comments on a previous version of this paper. The usual disclaimers apply. The following abbreviations are used in the glosses: 1 first person, 2 second person, 3 third person, A transitive subject, ABS absolutive, AOR aorist, COMP complementizer, COMPL completive, COP copula, DAT dative, DEF definite, DS different subject, ERG ergative, FACT factive, FREQ frequentative, FUT future, INF infinitive, IRR irrealis, KINPOSS kin possessive, LINGEVID linguistic evidence, LOC locative, MIN minimal, M masculine, O object, PL plural, PROG progressive, PROP proprietive, PRF perfect, PRS present, PST past, PTCP participle, PURP purposive, QU question, RDP reduplication, REM re-

mote, S intransitive subject, SBJV subjunctive, SBZ substantivizer, SG singular, SRESS superessive, TOD today, UA unit-augmented, VCLF verb classifier.

2. It should be noted that E-subordination is a necessary but not a sufficient condition for links to a participant in the main clause. As shown in Section 2, there are temporal clauses, like *after*-clauses in English, that allow E-subordination but do not have links to a participant in the main clause. Such structures allow E-subordination as an information-structural option, whereas structures like the ones discussed here are inherently E-subordinated, probably due to the semantics of the interclausal relation. See Verstraete (2004) on the relation between E-subordination, information structure, and interclausal semantics.

References

Bolkestein, Machtelt
1991 Causally related predications and the choice between parataxis and hypotaxis in Latin. In *New Studies in Latin Linguistics*, Robert Coleman (ed.), 427–451. Amsterdam/Philadelphia: Benjamins.

Bossong, Georg
1979 Typologie der Hypotaxe. *Folia Linguistica* 13: 33–54.

Brøndal, Viggo
1972 The problem of hypotaxis. In *Syntactic Theory 1. Structuralist*, Fred Householder (ed.), 23–30. Harmondsworth: Penguin. [Translation of Le problème de l'hypotaxe, in *Mélanges linguistiques et philologiques offerts a M. Aleksandar Belic*, 1937.]

Cristofaro, Sonia
2003 *Subordination*. Oxford: Oxford University Press.

Donaldson, Tamsin
1980 *Ngiyambaa*.Cambridge: Cambridge University Press.

Ebert, Karen
1991 Vom Verbum dicendi zur Konjunktion. In *Von Europa bis Ozeanien – von der Antonymie zum Relativsatz*, Walter Bisang, and Ulli Rinderknecht (eds.), 77–95. Zürich: Seminar für Allgemeine Sprachwissenschaft.

Emonds, Joseph
1970 Root and structure-preserving transformations. Ph.D. diss., Massachusetts Institute of Technology.

Foley, William, and Robert Van Valin
1984 *Functional Syntax and Universal Grammar*. Cambridge: Cambridge University Press.

Givón, Talmy
1994 Irrealis and the subjunctive. *Studies in Language* 18: 265–337.

Haspelmath, Martin
1993 *A Grammar of Lezgian*. Berlin/New York: Mouton de Gruyter.
Haspelmath, Martin, and Ekkehard König (eds.)
1995 *Converbs in Cross-Linguistic Perspective*. Berlin/New York: Mouton de Gruyter.
Heine, Bernd, and Tania Kuteva
2002 *World Lexicon of Grammaticalization*. Cambridge: Cambridge University Press.
Hengeveld, Kees
1998 Adverbial clauses in the languages of Europe. In *Adverbial Constructions in the Languages of Europe*, Johan van der Auwera (ed.), 335–419. Berlin/New York: Mouton de Gruyter.
Jespersen, Otto
1924 *The Philosophy of Grammar*. London: Allen & Unwin.
Keenan, Edward
1971 Two kinds of presupposition in natural language. In *Studies in Linguistic Semantics*, Charles Fillmore and Terence Langendoen (eds.), 44–52. New York: Holt, Rinehart & Winston.
Koptjevskaja-Tamm, Maria
1993 *Nominalizations*. London: Routledge.
McGregor, William
1988 Mood and subordination in Kuniyanti. In *Complex Sentence Constructions in Australian Languages*, Peter Austin (ed.), 37–67. Amsterdam/Philadelphia: Benjamins.
1990 *A Functional Grammar of Gooniyandi*. Amsterdam/Philadelphia: Benjamins.
McKay, Graham
2000 Ndjébbana. In *Handbook of Australian Languages. Volume 5*, Robert M. W. Dixon, and Barry Blake (eds.), 154–354. Oxford: Oxford University Press.
Palmer, Frank
1986 *Mood and Modality*. Cambridge: Cambridge University Press.
1987 The typology of subordination: Results, actual and potential. *Transactions of the Philological Society* 1987: 90–109.
2001 *Mood and Modality*. 2nd ed. Cambridge: Cambridge University Press.
Quirk, Randolph, Sidney Greenbaum, Geoffrey Leech, and Jan Svartvik
1985 *A Comprehensive Grammar of the English Language*. London: Longman.
Roberts, John
1988 Amele switch-reference and the theory of grammar. *Linguistic Inquiry* 19: 45–63.

Tikkanen, Bertil
1995 Burushaski converbs in their South and Central Asian areal context. In *Converbs in Cross-Linguistic Perspective*, Martin Haspelmath, and Ekkehard König (eds.), 487–528. Berlin/New York: Mouton de Gruyter.

Tomlin, Russell
1985 Foreground-background information and the syntax of subordination. *Text* 5: 85–122.

Townsend, David, and Thomas Bever
1977 *Main and Subordinate Clauses: A Study in Figure and Ground*. Bloomington: Indiana University Linguistics Club.

Verstraete, Jean-Christophe
2004 Initial and final position for adverbial clauses in English: The constructional basis of the discursive and syntactic differences. *Linguistics* 42: 819–853.

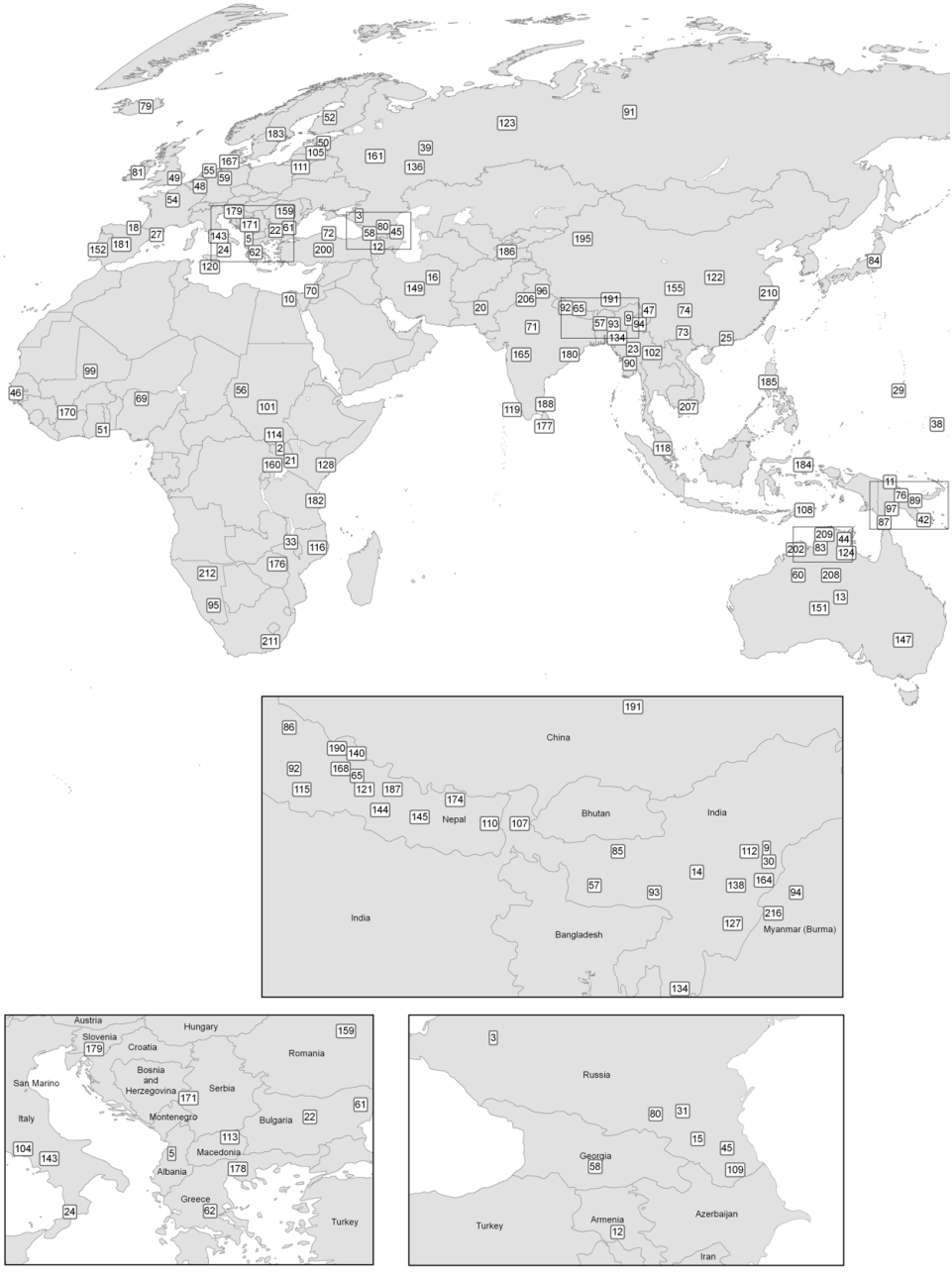
Wilkins, David
1989 Mparntwe Arrernte (Aranda): Studies in the structure and semantics of grammar. Ph.D. diss., Australian National University.

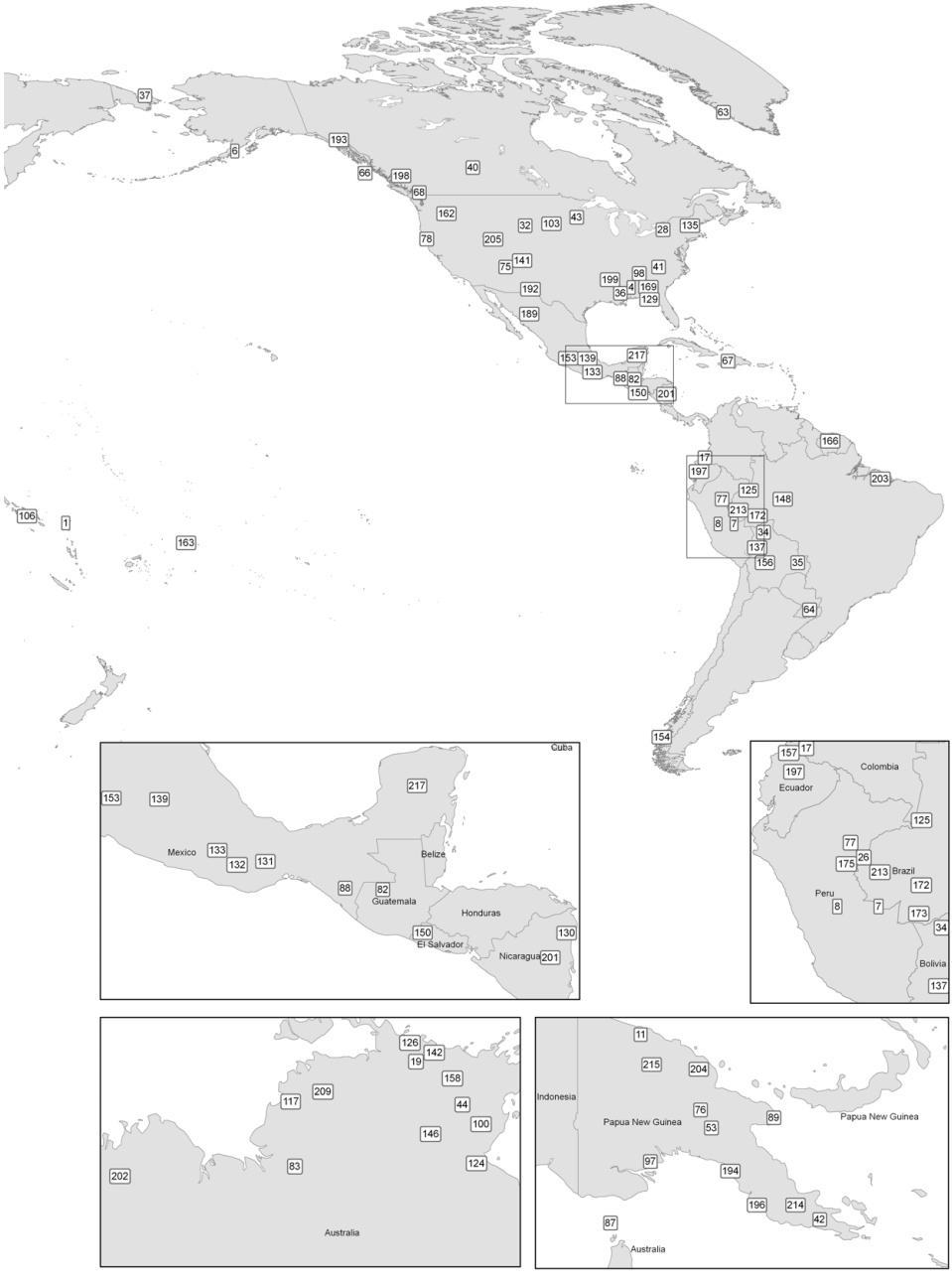
Winter, Eugene
1982 *Towards a Contextual Grammar of English. The Clause and its Place in the Definition of the Sentence*. London: Allen & Unwin.

Appendix: Map of languages

The following list contains all languages reported by the authors of this volume as occuring in their chapters. The map on pages 386–387 shows their approximate location. Wherever possible, the language names in the database of *The World Atlas of Language Structures* (*WALS*) (Haspelmath et al. [eds.] 2005) are used. In case authors have had reasons to depart from this, *WALS* names are given in parentheses. Languages not found in the *WALS* database are marked (with † in case of ancient languages not found in *WALS*). The purpose of the map is to give readers an idea as to where each language is spoken, but it is not meant to be a report of a scholarly study of linguistic geography. The languages are numbered from 1 to 217 and they are marked with these numbers on the map. We thank Ljuba N. Veselinova for having drawn the map.

1. Äiwoo [*WALS*: Ayiwo]
2. Acholi
3. Adyghe (Temirgoy)
4. Alabama
5. Albanian
6. Alutiiq
7. Amahuaca
8. Amuesha
9. Ao
10. Arabic (Egyptian)
11. Arapesh
12. †Armenian (Classical) [*WALS* distinguishes three varieties of modern Armenian]
13. Arrernte (Mparntwe)
14. Assamese
15. Avar
16. †Avestan
17. Awa Pit
18. Basque
19. Bininj Gun-Wok
20. Brahui
21. Bukusu
22. Bulgarian
23. Burmese
24. Calabrian [not in *WALS* as a separate variety of Italian]
25. Cantonese
26. Capanahua
27. Catalan
28. Cayuga
29. Chamorro
30. Chang
31. Chechen
32. Cheyenne
33. Chichewa
34. Chimane [*WALS*: not distinguished from Mosetén]
35. Chiquito
36. Choctaw
37. Chukchi
38. Chuukese
39. Chuvash
40. Cree (Plains)
41. Creek
42. Daga
43. Dakota
44. Dalabon [*WALS*: Ngalkbun]
45. Dargwa
46. Diola-Fogny


China
Bhutan
India
Nepal
India
Bangladesh
Myanmar (Burma)
Austria
Slovenia
Hungary
Croatia
Romania
San Marino
Bosnia and Herzegovina
Serbia
Italy
Montenegro
Bulgaria
Macedonia
Albania
Greece
Turkey
Russia
Georgia
Armenia
Azerbaijan
Turkey
Iran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106
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Cuba
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139
Mexico
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132
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Belize
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Guatemala
Honduras
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El Salvador
Nicaragua
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Colombia
Ecuador
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Peru
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100
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215
204
Indonesia
76
89
Papua New Guinea
53
Papua New Guinea
97
194
196
214
42
87
Australia

47. Dulong
48. Dutch
49. English
50. Estonian
51. Ewe
52. Finnish
53. Fore
54. French
55. Frisian
56. Fur
57. Garo
58. Georgian
59. German
60. Gooniyandi
61. †Gothic
62. Greek (†Classical, †Homeric, Modern) [WALS distinguishes two modern varieties]
63. Greenlandic (West)
64. Guaraní
65. Gurung
66. Haida
67. Haitian Creole
68. Halkomelem
69. Hausa
70. Hebrew (Modern)
71. Hindi
72. †Hittite
73. Hmong Daw
74. Hmong Njua
75. Hopi
76. Hua
77. Huariapano [not in *WALS*]
78. Hupa
79. Icelandic
80. Ingush
81. Irish
82. Jakaltek
83. Jaminjung
84. Japanese
85. Kachari
86. Kaike [not in *WALS*]
87. Kala Lagaw Ya
88. Kanjobal [*WALS* distinguishes two varieties]
89. Kâte
90. Kayah Li (Eastern)
91. Ket
92. Kham
93. Khasi
94. Khiamniungan [not in *WALS*]
95. Khoekhoe
96. Kinnauri
97. Kiwai
98. Koasati
99. Koyra Chiini
100. Kriol [*WALS* distinguishes two varieties]
101. Krongo
102. Lahu
103. Lakhota
104. †Latin
105. Latvian
106. Lavukaleve
107. Lepcha
108. Leti
109. Lezgian
110. Limbu
111. Lithuanian
112. Lotha
113. Macedonian
114. Ma'di
115. Magar
116. Makua
117. Malakmalak
118. Malay
119. Malayalam
120. Maltese
121. Manange [not in *WALS*]
122. Mandarin
123. Mansi
124. Mara
125. Matis
126. Maung
127. Meithei
128. Meru [not in *WALS*]

129. Mikasuki
130. Miskito
131. Mixe (Coatlán)
132. Mixtec (Chalcatongo)
133. Mixtec (San Miguel el Grande)
134. Mizo
135. Mohawk
136. Mordvin (Erzya)
137. Mosetén
138. Nagamese [*WALS*: Naga Pidgin]
139. †Nahuatl (Classical)
140. Nar-Phu
141. Navajo
142. Ndjébbana
143. Neapolitan (Old) [not in *WALS*]
144. Nepali
145. Newar (Dolakha) [*WALS*: Newari (Dolakha)]
146. Ngalakgan [*WALS*: Ngalakan]
147. Ngiyambaa
148. Paumarí
149. Persian
150. Pipil
151. Pitjantjatjara
152. Portuguese
153. Purépecha
154. Qawasqar
155. Qiang
156. Quechua (Cochabamba)
157. Quechua (Imbabura)
158. Rembarrnga [*WALS*: Rembarnga]
159. Romanian
160. Runyoro-Rutooro
161. Russian
162. Sahaptin (Umatilla)
163. Samoan
164. Sangtam [not in *WALS*]
165. †Sanskrit
166. Saramaccan
167. †Saxon
168. Seke [not in *WALS*]
169. Seminole
170. Senadi
171. Serbian-Croatian
172. Shanenawa [not in *WALS*]
173. Sharanahua
174. Sherpa
175. Shipibo-Konibo
176. Shona
177. Sinhala
178. †Slavonic (Old Church)
179. Slovene
180. Sora
181. Spanish
182. Swahili
183. Swedish
184. Taba
185. Tagalog
186. Tajik
187. Tamang
188. Tamil
189. Tarahumara (Central)
190. Thakali
191. Tibetan (Dege, Kyirong) [*WALS* distinguishes three varieties]
192. Tiwa (Southern)
193. Tlingit
194. Toaripi
195. †Tocharian [not in *WALS*]
196. Tok Pisin
197. Tsafiki
198. Tsimshian (Coast)
199. Tunica
200. Turkish
201. Ulwa [*WALS*: not distinguished from Sumu]
202. Ungarinjin
203. Urubú-Kaapor
204. Usan
205. Ute
206. †Vedic
207. Vietnamese
208. Warlpiri

209. Warray [*WALS*: Waray (in Australia)]
210. Wu [*WALS* has (only) Changzhou Wu]
211. Xhosa
212. !Xun (Ekoka)
213. Yaminahua
214. Yareba
215. Yimas
216. Yimchungrü [not in *WALS*]
217. Yucatec

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