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Functions of nominal classification

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ABSTRACT

Nominal classification systems are generally categorized on the basis of morphosyntactic criteria. However, the functional motivations for these phenomena do not coincide directly with their morphosyntactic properties: some functions are shared by diverse systems, and each morphosyntactic type may serve diverse communicative functions. We provide a functional typology for nominal classification, including both noun class and classifier systems. We focus on two types of functions: semantic, i.e., the use of classification markers to expand the referential power of the lexicon, and discourse/pragmatic, i.e., the use of classification markers to establish and manipulate the status of discourse referents. We identify functions that are shared by formally diverse systems as well as functions that depend on means of expression. We also review psycholinguistic evidence for the role of nominal classification in language comprehension and production.

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1. Introduction[1]

Nominal classification systems are generally categorized on the basis of morphosyntactic criteria, and studies of these systems have identified a range of communicative functions such as tracking of discourse referents or presentation of them from different perspectives (see below for discussion and references). However, the functional motivations for these grammatical phenomena do not coincide directly with their morphosyntactic properties: some functions are shared by formally diverse systems, and each morphosyntactic type may serve diverse communicative functions. Also, studies of nominal classification sometimes differ in their definitions of terms, in their goals, and in the phenomena that they focus on. In this paper we aim to provide a systematic framework for describing functional motivations for nominal classification, including both noun class and classifier systems. We identify the most important functions, relate function to means of expression, and compare functions across morphosyntactic forms. Due to space constraints we will focus on the question of functions of nominal classification itself rather than on the issue of the extent to which the principles for assigning nouns to classes are semantically motivated. We also take a synchronic perspective on nominal classification systems rather than tracing their historical origins (see, e.g., Aikhenvald, 2000, Chapters 11–13 and references therein). We draw examples from the

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[1] Abbreviations: 3.ACT.PRO, 3rd person active pronominal marker; 3.UND.PRO, 3rd person undergoer pronominal marker; ACC, accusative; ALL, allative; ANIM, anim., animate; ATT, attributive marker; AUG, augmentative; CM, common; CL, cl., class; CLF, classifier; coll., collective; CON, sentence connector pronoun; CONSEC, consecutive; CONT, continuous; COP, copula; COUNT, countable; CP, concordial prefix; DEICTIC.CLF, deictic classifier; DEM, demonstrative; DISC, discourse particle; DIST, distal; ECHO, prosodic echo vowel; ERG, ergative; EXIST, existential; FEM, fem., feminine; FUT, future; GCM, general class marker; HAB, habitual; HUM, human; IMPERF, imperfective; INAN, inanimate; INCOMPL, incompletive; INDEF, indef., indefinite; INSTR, instrumental; INTER, interrogative; LOC, locative; MASC, masc., masculine; MOD, modifier particle; NCLF, noun classifier; NCP, noun class prefix; NEG, negative; NEUT, neut., neuter; NUM.CLF, numeral classifier; OBJ.PFX, object prefix; PERF, perfective; PERS, person; pfx, prefix; PL, pl., plural; POSS, possessive; PRED, predicative; PRO, pronoun; PROX, proximal; PRT, particle; PURP, purposive; QUANT, quantifier; QUOT, quotative; REL.PRO, relative pronoun; REL.CLF, relational classifier; RELZ, relativizer; SCM, specific class marker; SG, sg., singular; SUBJ.PFX, subject prefix; SUBORD, subordinate; TAM, tense-aspect-mood marker; TH, thematic.

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major morphosyntactic types of nominal classification, using languages from diverse families, but we do not claim that our sample is representative. Like the typologies of classification systems that have been proposed over the past 10–15 years, our framework is preliminary and should be tested against a wider sample of the world's languages.

By way of an introduction, in Section 2 we clarify terminological points and consider differences between noun classes/gender and classifiers.[2] In Section 3 we provide an overview of recent research on the topic. In Sections 4 and 5 we discuss two types of functions of nominal classification: semantic functions, i.e., the use of noun class markers and classifiers to expand the referential power of the lexicon, and discourse functions, i.e., the use of classification markers to establish and manipulate the status of a referent in discourse. Finally, Section 6 reviews psycholinguistic studies of nominal classification that provide evidence for its role in language comprehension and production. In the Conclusions we summarize our findings with regard to functional commonalities among morphosyntactically diverse systems and differences related to forms of grammatical realization. We also suggest some avenues for future research.

2. Terms and definitions

2.1. What is 'function(ality)'?

In this paper we use 'function' and 'functional' along the lines that these terms have been used by linguists who espouse theoretical frameworks described as 'functionalist' (e.g., Jakobson, 1960; Dik, 1978; Halliday, 1994; Harder, 1996; Givón, 2001; Diver, 2012). Although there are many differences among these approaches, they share the goal of seeking cognitive and communicative motivations for linguistic structure. In this regard they distinguish themselves from approaches that treat grammar as based on principles that are independent of meaning, communicative interaction, or general human cognitive abilities, such as some versions of generative grammar (e.g., Chomsky, 1974; Hoekstra and Kooij, 1988; Newmeyer, 1998, Chapter 2). In particular, our use of the term 'functional' differs from the use of this word within generative approaches that divide linguistic categories into 'lexical' vs. 'functional' (i.e., grammatical), e.g., introductory textbooks such as Carnie (2013, p. 52). For one thing, nominal classification is expressed by linguistic forms that fall on both sides of this divide: many classifiers are relatively 'lexical' whereas markers of concordial agreement would most likely be described as 'functional' or grammatical. Indeed, the latter are often not regarded as 'functional' in the way we are using the term, because they are perceived to be meaningless (see below for further discussion of this point). However, we regard all the types of nominal classification discussed in this paper as 'functional' in our sense: they all contribute to communication, either by adding to the lexicon, affecting the interpretation of lexical items, helping to track discourse referents, or contributing to discourse processing.[3]

Some scholars have regarded nominal classification systems as grammatical forms that lack communicative motivation, either because the assignment of nouns to classes may be largely arbitrary from a semantic point of view, or because the use of a classifier or 'agreement' marker is seen as redundant, merely repeating information already supplied by a noun.[4] Such arguments assume a narrow conception of 'function', prevalent in the grammatical tradition inherited from Western classical views of language, namely that the function of language is to convey propositional content, or 'semantico-referential' meaning (Silverstein, 1976). Although other functions have long been recognized (see, e.g., Vološinov, 1973 [1928], pp. 99–106; Bühler, 1982 [1933], pp. 147–164; Jakobson, 1960), the referential function continues to serve as the basis for the definition of linguistic units at all levels, and other functions are ignored or seen as marginal (Silverstein, 1976). A further, related assumption is that 'meaningfulness' is to be construed in a narrow, information-theoretic sense (Shannon and Weaver, 1949): linguistic elements seen as not adding new (referential) information are regarded as redundant, hence meaningless.

Thus for example it is sometimes suggested that marking of gender on first and second person singular pronouns is communicatively useless, presumably because the gender of speech-act participants may be obvious from visual cues and is therefore redundant (Trudgill, 2011, pp. 160–161). However, given the ubiquitous social importance of gender differentiation in human societies, obligatory marking of gender on referential indices should come as no surprise. Such marking may serve to reinforce that differentiation, while also being available for creative manipulation, e.g., in reported speech or for stylistic purposes (Trechter, 1999); to signal affect (Tobin, 2001) (see Section 4.4), or to signal gender status that does not fit into a dichotomous partition, such as that of *hijra*s in India (Hall and O'Donovan, 1996).

In this paper we will take a broad view of 'function', that includes affective/social as well as referential information (see Sections 4.4 and 5.3), and information that helps with discourse processing (see Sections 5.1, 5.2 and 6). Our approach to the functionality of noun classes/gender is thus consistent with that of scholars such as Jakobson (1959), Heath (1975) and

[2] The terms 'gender' and 'noun class' have sometimes been used interchangeably (cf. Guthrie, 1948; Corbett, 1991; Aikhenvald, 2000). To avoid confusion, we will restrict the term 'gender' to the subset of noun class systems in which assignment principles are at least partly sex-based, as in German or Arabic.

[3] Some syntacticians have problematized a sharp distinction between 'lexical' and 'functional' categories, arguing that the notion 'functional category' should be regarded as multidimensional in nature (e.g., Muysken, 2008, pp. 144–145). The term 'semi-lexical', coined by van Riemsdijk (1998) for the N_1 in constructions such as Dutch *een* ***plak*** *kaas* 'a **slice** [of] cheese' (see van Riemsdijk, 1998, pp. 1–48), has been applied to mensural classifiers in languages such as Vietnamese (cf. Löbel, 2001). However, the question where to draw the line between 'lexical' and 'functional' does not affect the point we are making about the difference between our use of the term 'functional' and its use in formal syntax.

[4] See, e.g., Claudi (1997), McWhorter (2005, pp. 40–41, 74–75), Neumann-Holzschuh (2006, pp. 260–266) and Trudgill (2011, pp. 154–167) on noun classes/gender, and Greenberg (1972, p.10), Hundius and Kölver (1983, pp. 186–189) and Beckwith (1998) on classifiers. For a history of approaches to noun classes/gender in Western linguistics, see Kilarski (2007, forthcoming).

H. Seiler (1986, 1987). In the context of discourse processing, referential redundancy may be seen as an advantage rather than a liability. Although it would be impossible to claim that every conceivable nominal classification system is functional in one or more of the ways we have mentioned, based on our data it is reasonable to expect to find some functionality in all such systems.

In the rest of this section we clarify other terminological issues.

2.2. Classification of nouns vs. classification of referents

The terms 'noun classification', 'nominal categorization', and the like are widely used in an ambiguous manner. It is rarely made clear what, exactly, is being classified: nouns, as linguistic objects, or entities in the extra-linguistic world, to which nouns (also) refer? This point is made by Senft (2000a, p. 27) (see also Senft, 2007, p. 688):

> In our descriptions of classifiers in the noun phrase we usually use sentences like 'this classifier refers to this noun' or 'this classifier refers to this nominal referent'. Both sentences may be understood as a kind of 'shorthand' for 'this classifier refers to this noun which itself is used as the expression to refer to, e.g., an object in the extralinguistic reality'. However, the shorthand versions open up a 'nice' ambiguity with respect to this 'reference'.

and further (p. 36):

> The classifier that refers to a nominal referent may individuate the noun and then highlight a special (shade of) meaning which then extracts one special referent out of the sum of possible extralinguistic referents the noun can refer to if it is not specified by this classifier. If this is the case, we have to ask whether the classified noun the classifier referred to is still the same noun that is to be found in the lexicon (without being classified by one or the other or even by more classifiers). Does a classifier only refer to an object in the extralinguistic reality or does it also refer to the intralinguistic category 'noun' and change its meaning? Or, in other words, does the C[lassificatory] P[article] refer to a 'referent' in the 'real world' or to a 'noun', an entity in the lexicon of a language?

Senft himself finds it difficult to answer this question (see p. 37), and does not propose any criteria for deciding. A possible criterion is suggested by Lucy (2000, p. 331), in his concluding comments to the Senft volume (Senft, 2000b):

> [W]hen we use the phrase 'nominal classification', we should be speaking in every instance about the classification of experience (referents) unless it can be firmly established that the marking pattern is purely formal, in which case we can say that the nouns, as linguistic forms, are themselves classified.

In other words, Lucy suggests that if the choice of a classification marker is based on its semantic content, one should speak of classification of referents rather than of nouns. Conversely, if the choice of classification marker is determined by other factors, such as morphosyntactic features of a noun that identifies the same referent, one should speak of a classification of nouns.

At the same time, Lucy points out that both types of classification have an underlying functional connection: 'their contribution to adequate noun phrase reference' (Lucy, 2000, p. 329). The functional connection between systems of noun classification and systems of referent classification manifests itself in a number of ways. For example, as suggested by Corbett (1991, p. 169), similar semantic distinctions are found in both 'pronominal gender systems' and noun classification systems. In addition, according to Greenberg's Universal 43 (1963, p. 75), the existence of gender categories in the noun presupposes their existence in the pronoun.

Classification markers always serve to help identify discourse referents, either directly – by providing information about them such as gender or animacy (classification of referents, as is found in pronominal classification), or indirectly – by indexing properties of a noun that would identify the referent (classification of nouns). Because of this shared function, no classification system is ever 'purely formal', even in languages in which nouns as linguistic forms are classified. For one thing, as pointed out e.g., by Greenberg (1966, p. 81), Aksenov (1984, p. 18) and Corbett (1991, p. 8) with regard to noun classes/gender, all systems of assignment of nouns to classes have a semantic 'core' or 'basis'. Furthermore, in such languages the same classification markers are used for both semantic/pragmatic and formal purposes. For example, if a Spanish speaker were to point at a woman and say *es linda* '[she] is pretty (fem.)', one could argue that the feminine gender marker on the adjective is being used to classify the referent as female. However, if the same speaker said the same thing while listening to a song (*canción*, fem.), one would be more likely to argue that the gender marker indexes a noun of the feminine gender.

Aside from the theoretical issue just mentioned, in actual practice it is not a simple matter to decide whether a marking pattern is a classification of entities or a classification of nouns, as pointed out by Senft in the quotation above. Lucy (2000, p. 334) himself acknowledges the difficulty of deciding whether a given semantic interpretation is to be ascribed to a noun, a classifier, or the construction in which these forms appear together. We return to this point in Section 4.

Since classification markers share the function of identifying referents, we define nominal classification in a broad way as classification of nouns and/or extralinguistic entities to which nouns refer that is grammaticalized to some degree, and expressed in one or more syntactic contexts that relate to nouns. These contexts include both NP-internal contexts, such as determiners, numerals and genitive phrases, and NP-external contexts, such as verbs. We reserve the term 'noun classification' for systems that include at least some classification of nouns as linguistic forms.

2.3. Noun classes vs. classifiers

Types of lexical and grammatical classification can be arranged according to degree of grammaticalization – from the most lexical, as in verbs of ingesting, through the intermediate classifiers to the most grammaticalized noun classes. We illustrate this in Table 1.

In a fully grammaticalized system all nouns must be assigned to a class and the expression of noun class is obligatory, while in classifier systems some nouns may remain unclassified and the expression of classification may not be obligatory in all contexts. In general, noun class systems are more grammaticalized than classifier systems, but as pointed out, e.g., by Aikhenvald (2000, p. 14) and Grinevald (2002), degrees of grammaticalization can be found within both noun class and classifier systems. For our purposes it is not essential to establish a rigid distinction between these types of system. However, our term 'nominal classification', as defined above, does not include lexical categorization, which is not paradigmatic and not obligatory. For example, the choice between English verbs of ingesting, as in *drink* vs. *chew*, reflects differences in the properties of the ingested referent. However, this difference does not systematically reappear with other verbs nor is it required (cf. Aikhenvald, 2000, p. 153).

In this paper we follow Senft (2007) in using the term 'classifiers' to refer to all types of nominal classification except for noun class/gender, and we use the cover term 'classification markers' for all types of classification systems. This differs from Aikhenvald's (2000) use of the term 'classifiers' as a cover term to include both noun classes/genders and classifier systems.

Morphosyntactic typologies of nominal classification identify five major differences between noun classes and classifiers: the presence of overt marking of agreement, realization, assignment principles, the size of inventory and variability (see Dixon, 1982, 1982 [1968]; Aikhenvald, 2000, 2004; Grinevald, 2000). These are summarized in Table 2.

Only noun classes are realized in patterns usually called 'agreement': a noun's class is reflected in the form of constituents within or outside the NP and may also be marked on the noun. In contrast, the choice of a classifier is indicated once by way of an affix or an independent word. As regards assignment, in noun class languages classification markers may identify referents based on semantic properties such as animacy or sex, or the assignment of nouns to one or another class may be relatively opaque from a semantic point of view; nouns may be assigned to classes based on their phonological or morphological properties. In contrast, the choice of a classifier is not generally determined by phonological or morphological properties of nouns. Instead, it is either motivated by properties of the referent, such as animacy, physical characteristics, function and social status, or a classifier may be associated with a relatively conventionalized set of nouns (see Section 6.2). Thus although classifiers in languages like Mandarin (Chinese) are often described as semantic in nature, one cannot necessarily predict which classifier will be used based only on properties of the referent. Mandarin speakers must learn that certain classifiers are used with some nouns but not others, and children sometimes use an 'incorrect' classifier (see, e.g., Erbaugh, 1986, p. 420), even though it might make sense semantically.

As regards the size of inventory, noun classes are usually relatively few in number and form a closed set, whereas classifiers may constitute a larger open system in which the distinction between a classifier and other lexical items is not always clear-cut (see Downing, 1996, Introduction and Beckwith, 2007, Chapter 1 for discussion of this point). As regards variability, noun classes typically have well-defined, mutually exclusive membership, while in a classifier system there may be more flexibility in the use of a noun with different classifiers depending on how the referent is being presented.

Types of classifiers (non-concordial classification markers) are usually distinguished on the basis of morphosyntactic properties.[5] 'Numeral classifiers', 'group classifiers' such as English *flock* (e.g., of sheep), and 'mensural classifiers' (all termed 'phoronyms' by Beckwith, 2007), occur in the context of a 'pseudopartitive construction', i.e., a combination of specifier (a numeral, quantifier, or determiner) + classifier + Noun.[6] Noun classifiers occur in contexts other than quantification.[7] Genitive classifiers occur in possessive constructions and are typically chosen depending on the properties of the referent of the possessed noun or the relation between the possessor and the possessed. Classifiers can also appear on the verb in the form of affixes, incorporated nouns and suppletive classificatory stems. Such 'verbal classifiers' (cf. Aikhenvald, 2000, Chapter 6) classify the referent of a noun in Subject function (for intransitive verbs) or Object function (for transitive verbs). Finally, among the least common types of classifiers, deictic classifiers appear with articles and demonstratives, whereas locative classifiers appear in locative NPs.

In the following discussion we do not attempt to include all attested types of nominal classification. As pointed out by Aikhenvald (2000, pp. 13–14) classification is a gradient phenomenon, and even her whole book cannot cover every type. As we will show, some functions are shared even by formally diverse systems, while others are more closely tied to means of expression.

[5] See Aikhenvald (2000, Chapters 3–7); our 'genitive classifiers' are referred to by Aikhenvald as 'classifiers in possessive constructions'.

[6] The term 'pseudopartitive' was coined by Selkirk (1977) to distinguish noun phrases such as *a bushel of apples* from true partitives such as *three of the chapters*. Semantically, these constructions differ in that the former contains two noun phrases but identifies only a single referent whereas the latter identifies two referents. There is a copious literature on the syntax of pseudopartitives, including numeral classifier phrases. For general discussion, see Beckwith (2007, Chapter 2) and Alexiadou et al. (2007, Chapter 2).

[7] One reviewer states that noun classifiers 'seem to be functionally identical to class terms [i.e., terms used in compounds such as *berry* in *blackberry*], the only difference being that 'noun classifiers' are typically not affixed to their qualifying term.' However, the morphemes described as 'noun classifiers', e.g., by Grinevald (2000, pp. 64–65) and Aikhenvald (2000, pp. 86–90) are more grammaticalized than class terms and differ in their obligatoriness and discourse functions. For example, noun classifiers in some Mayan languages can be used anaphorically like third person pronouns (see example (11) below) or they may indicate thematic importance of the referent (see example (18)).

Table 1
Lexical and grammatical means of classification (adapted from Grinevald, 2000, p. 61).

Degree of grammaticalization		
Lexical	>>>>>>>	Grammatical
Verbs of ingesting (E *drink, chew*)	Classifiers	Noun classes/gender

Table 2
Noun class/gender vs. classifiers.

Property	Noun class/gender systems	Classifier systems
Presence of overt agreement	Yes	No
Realization	May be marked on the noun	Not affixed to the noun
Assignment principles	Semantic or semantic/phonological/morphological	Semantic or lexical
Size of inventory	Relatively small; closed system	Relatively large; open system
Variability	Noun class membership mutually exclusive	Classifier choice may reflect ways of presenting the referent

3. Review of research on functions

The topic of functions of nominal classification has been addressed from various perspectives by a number of scholars. We will not attempt an exhaustive review of this literature, but instead mention some of the most influential and well-known works on this topic.

The first attempts at typologies of nominal classification systems appear in the 1970s. The papers by Adams and Conklin (1973), Adams et al. (1975), Denny (1976), Allan (1977) and Dixon (1982, 1982 [1968]) aim at identifying common semantic properties of selected types, but also provide information about their functions involving, e.g., variable classification, individuation and anaphoric use.

Nominal classification was one of the areas addressed by the Language Universals Research and Language Typology (UNITYP) project conducted at the University of Cologne. The goal of the project was to investigate the linguistic phenomena that contribute to the function of 'apprehending the object', i.e., 'representing the concept of an object by means of language' (H. Seiler, 1986, p. 142; cf. also Serzisko, 1982; Walter, 1982). In this model a wide range of 'techniques', including numeral classification and gender agreement, are arrayed along the 'dimension' of 'apprehension', but the focus is on the contribution of these morphosyntactic phenomena to that overarching function, rather than on the various functions that can be performed by a given 'technique'. By contrast, in the present paper we focus on nominal classification as a linguistic phenomenon and explore its communicative functions, without giving priority to any particular function.

Bisang (1993, 1999) proposes a typology of classifier languages on the basis of functions of classifiers in East and Southeast Asian languages. Bisang sees classifiers as involved in the process he calls 'concretization', which includes four functions: individualization, classification, referentialization and relationalization (in possessive and relative constructions). As we will show, some of these functions are also found in noun class/gender systems.

The papers collected in Craig (1986c) deal with cognitive and cultural aspects of categorization as well as issues concerning specific nominal classification types. Several papers consider functions of nominal classification, i.e., semantic functions of gender (Zubin and Köpcke, 1986) and numeral classifiers (Adams, 1986; Denny, 1986) as well as discourse functions of numeral classifiers (Downing, 1986; Hopper, 1986).

The studies by Colette Craig (Grinevald) and Alexandra Aikhenvald reflect the emergence of a typology of nominal classification systems based on a growing sample of languages. Craig's papers on noun classifiers (Craig, 1986a,b) and the overviews in Craig (1992, 1994) and Grinevald (2000, 2004) propose a morphosyntactically based typology of classification systems, and also deal with functions of nominal classification. Her most extensive discussion of functions is in the 2000 paper, where she identifies the functions of individuation and referent-tracking as common to classifiers (Grinevald, 2000, pp. 74–76). She also draws on the work of Rijkhoff (1990) on the layered structure of NPs to relate three major types of NP-internal classification marking to the general semantic domains of 'locality', 'quantity', and 'quality', indicated by genitive, numeral, and noun classifiers, respectively. Grinevald (2000, pp. 78–79) explores functional motivations for these form-meaning correlations, but she does not address functions of noun class/gender systems.

The efforts at a typology culminated in the extensive study by Aikhenvald (2000) based on a sample of about 500 languages (cf. also Aikhenvald, 2004).[8] Aikhenvald's typology is based on a range of formal and semantic parameters, some of which have been applied in the comparison of noun class and classifier systems in Section 2.3 above. In the course of her discussion Aikhenvald gives a great deal of information about functions, especially in Chapter 12, but also in the individual chapters on specific devices, and we have drawn on her work at various points in the present paper. Our own goal is not to achieve exhaustiveness (which no paper could do), but rather to identify the most important functions, relate functions to means of expression for the most common classification types, and to compare functions across morphosyntactic forms.

[8] Note that Aikhenvald's (2000) definition of 'noun categorization' differs from ours. In her Preface she states: 'throughout the book 'linguistic categorization of a noun' is used to mean 'linguistic categorization of the referent of a noun'' (p. vii). As mentioned in Section 2.2 above, we aim to distinguish between classification of referents and classification of nouns.

Two anthologies edited by Senft (2000b) and Unterbeck and Rissanen (2000) include papers that make important theoretical points about functions of classification. In an introductory paper, Senft (2000a) uses the system of classificatory particles in Kilivila (Oceanic) as a case study to address some of the theoretical and methodological problems of analyzing a nominal classification system, including the issue, mentioned above, of whether one should speak of classification of nouns or of (extra-linguistic) referents. He begins by pointing out that classification in general has functional motivation for the human mind, and that linguistics studies 'processes of classification that are relevant for communication' (p. 11). With regard to functions, Senft lists a number of functions performed by the classificatory particles of Kilivila (more detailed discussion occurs in Senft, 1996, pp. 16–23). Senft's paper raises important questions about the analysis of nominal classification systems, but their functionality is not his main topic.

The volume edited by Unterbeck and Rissanen (2000) contains 28 papers dealing with synchronic and diachronic aspects of noun classes/gender as well as numeral classifiers and classificatory verbs. Two recurring motifs involve the tertia comparationis established on the basis of the function and semantic motivation of nominal classification systems (cf. Unterbeck, 2000a). According to several contributors, nominal classification systems have two related semantic functions, i.e., perspectivization and particularization, which correspond to some of the semantic functions we discuss in Section 4, particularly those of differentiating referents and individuation. For example, Leiss (2000) and Weber (2000) investigate gender in German from the point of view of perspectivization, or specification of 'nominal aspect'. A comparable interpretation is applied to numeral classifiers in Vietnamese (Mon-Khmer) (Löbel, 2000) and classificatory verbs in Navajo (Athabaskan) (Unterbeck, 2000b). In our paper, however, we offer a more inclusive account of functions of nominal classification, which is not restricted to specific semantic oppositions, and which also takes into consideration discourse functions of both noun classes and classifiers.

More recently, Dahl (2004, pp. 197–202) responds to claims about the dysfunctionality of gender by pointing to its cross-linguistic frequency and uniformity, diachronic stability and its frequent manifestation in discourse. Dahl also mentions the use of gender for reference tracking and disambiguation, particularly in languages with little other grammatical marking (as in Nunggubuyu (Australian), illustrated in example (10) below). In addition, he suggests that gender can be viewed as an error-checking mechanism that helps optimize distribution of information between grammatical markers – indicating categories such as gender – and lexical items.

The functionality of gender/noun classes has been approached from a diachronic perspective by Luraghi (2011), who distinguishes between two types of origin: 'gender from above' (through grammaticalization of less obligatory forms, e.g., classifiers) and 'gender from below' (from existing patterns of case or number marking). According to her, the resulting systems differ with respect to their primary function, i.e., classification (in gender from above) and referent tracking and disambiguation (in gender from below). In her article she focuses on the origin and development of gender in Proto-Indo-European as an example of increasing differentiation among animate referents as discourse relevant entities.

Issues relevant to nominal classification have also been addressed from the perspective of formal syntax. To some extent the issues discussed in that literature are theory-internal, such as debates about the precise feature structure of 'semi-lexical' heads, including some types of classifiers, and their position in phrase structure (see, e.g., discussion in Löbel, 2001 and Alexiadou et al., 2007, Part II, Chapter 2; Part III, Chapter 2). However, some formal syntax work bears on issues that concern us here, especially discussion of the relationship between classifiers and individuation, definiteness and referentiality. In what follows we address these questions from the perspective of functionality as we have defined it in Section 2.1.

In summary, previous studies of functions of nominal classification have identified a number of important functions, but have generally focused mainly on particular functions (e.g., semantic or discourse), or on particular forms of grammatical realization (e.g., classifiers vs. noun classes). In the present paper we bring together some of these disparate phenomena in order to identify functional commonalities and differences.

4. Semantic functions

Noun class markers and classifiers can be used to expand the referential power of the lexicon either by creating new lexical items or by presenting referents from different perspectives.[9] The degree to which a given classification system is used for one or the other of these functions depends on a number of factors. These include the number of classes or classifiers, the complexity and openness of the system, presence or absence of overt marking on the noun, and whether class assignment is primarily based on semantic or formal principles. Lexicon-expansion (in the sense of adding items to the lexicon) is mainly a property of the more grammaticalized systems. That is, where classifiers do not form lexical units with the nouns they identify we would not expect to find them being used to derive nouns. Such classifiers may provide a structuring principle for the lexicon, but they do so by grammatical modification of lexical units rather than by creating new ones. However, there can be transitional cases; we will discuss such cases below. In noun class languages semantic functions are expressed by way of changing overt marking on the noun or on 'agreement targets', and in classifier languages by assignment or choice of classifier.

For expository purposes we have divided semantic functions into several subtypes. The first, 'expansion of the lexicon', involves the use of nominal classification markers to create nouns. This function includes both derivational use of classification markers and cases where homophonous roots appear in more than one class with distinct but related meanings, but where it is less clear that they are related by a derivational process, such as Italian *melo* 'apple tree (masc.)' vs. *mela* 'apple (fem.)'. The second

[9] We use the term 'semantic' in a broad sense to include effects on the message that are not restricted to truth-conditional effects, and which could otherwise be referred to as 'pragmatic'.

type, 'differentiating referents', includes cases where classification markers serve to differentiate an otherwise semantically neutral lexeme, such as Mohawk (Iroquoian) *rón:kwe* 'man' vs. *iakón:kwe* 'woman' or Bearlake (Athabaskan) *Lidí seghánịchu* 'Hand me (a single box or bag) of tea' vs. *Lidí seghánịhge* 'Hand me (a cup or other shallow, open container) of tea' (see below for further discussion and sources of these examples). One especially important semantic function is that of individuation, to which we devote a special section. Finally, in the category of 'attributing properties to referents' we include cases where classification markers are used to express affective meanings such as a speaker's positive or negative attitude toward the referent.

We recognize that the boundaries between the abovementioned functions may be fuzzy at times. In some languages, some pairings of noun + classification marker are relatively lexicalized whereas others are productive, so the same language could fit into more than one of our functional categories. More importantly from a theoretical point of view, there are often disagreements about how to analyze the data. For example, if a given noun (as a linguistic form) is interpreted differently depending on which classification marker it is used with, should one analyze the noun as a set of homonyms each of which 'selects' a different classification marker, as a polysemous lexical item, or as a lexical item with a general, abstract meaning whose particular interpretation is induced by the choice of classification marker? This question comes up with regard to nouns both in noun class and classifier languages, and there is no single answer to it. In our presentation we generally organize the data according to the analyses in our sources, but we also point out areas of disagreement. Even if other scholars might categorize some of our examples differently, that does not affect our general point, which is to illustrate the range of semantic functions of nominal classification markers. Analyses in terms of homonymy, polysemy, or general/underspecified meaning can all be accommodated within our proposed framework; the differences would be in the assignment of particular examples to one rather than another of the subdivisions we discuss below.

4.1. Expansion of the lexicon

Lexical items can be created by using classification markers in derivational function, i.e., by reclassifying a given root. This use only includes examples where a process of lexeme-formation is clearly involved (in the sense of Aronoff, 1994, pp. 13–16), i.e., a process of derivation or compounding that does not involve supralexical syntax. As with derivational morphology in general, there are regular patterns but productivity and predictability of meaning may vary. We limit our discussion here to cases where class/gender assignment itself is used for derivational purposes, not, e.g., cases where derivational morphemes have inherent class assignment, such as the German diminutive suffix *-chen*, which is always neuter, or the French suffix *-tion*, which is always feminine.

Related to the derivational function is the role played by nominal classification in organizing semantically related lexical concepts into sets and using class differentiation as a means of signaling semantic contrasts. This goes beyond the grouping of particular nouns together into a class, and involves patterns of semantic relationship across classes. These patterns may not apply to every noun in a given semantic domain and may not rise to the level of regularity that would fit the definition of 'derivation', but their existence both reveals semantic relationships that transcend individual classes and can be a source for productive extension, i.e., a source for new lexical items.

We begin by giving examples of derivational use of classification markers, and then move on to the structuring function.

An example of pervasive and productive derivational use of noun class markers comes from Bantu languages, where noun class prefixes can be used to derive nouns from adjectival, verbal and nominal stems (see Mufwene, 1980; Schadeberg, 2003). In Swahili, all noun class prefixes can be used in this way, often accompanied by a derivational suffix, as in Table 3.[10]

Another example of connecting related concepts by cross-class relationships in Bantu involves the use of a stem with different noun class prefixes to express a nationality (ethnonym), the related geographic area (toponym), and the name of the related language (glossonym), as in the following examples from Luganda: *bùgandà* (Cl. 14) 'Ganda country'; *mùgandà* (Cl. 1) 'Ganda person, inhabitant of Buganda'; *lùgandà* (Cl. 11) 'Ganda language' (Snoxall, 1967).

Feminine markers in Afro-Asiatic languages have several derivational functions (see, e.g., Drozdík, 1974; Diakonoff, 1988, p. 58; Jurafsky, 1996). For example, in Classical Arabic the feminine marker *-at* is used as an intensifier, as well as a marker of a unit noun among non-humans without reference to sex, as in *ḥama:m-* 'pigeons, coll.' (with masc./fem. agreement) vs. *ḥama:m+at* 'one pigeon' (with fem. agreement); *layl-* 'night-time in general' (usually masc.) vs. *layl+at* 'one night' (fem.) (Hämeen-Anttila, 2000, pp. 600–602).

Noun class systems at an early stage of grammaticalization can also have a derivational function. Miraña (Bora-Witotoan) (Seifart, 2004, 2005) has a complex agreement system realized by six general class markers based on sex, animacy and number, over fifty specific markers and about thirty repeaters.[11] Specific class markers are productively used to derive nouns denoting parts or products of plants, as in *úhɨ-ʔo* (banana-SCM.OBLONG) 'a banana (fruit)', *úhɨ-kò* (banana-SCM.SHAFT) 'a banana plant', where class markers are suffixed to the unindividuated stem *úhɨ* 'banana(s)' (Seifart, 2004, p. 233). Two markers may

[10] Bantu noun classes are traditionally numbered so that separate, and usually adjacent, numbers are assigned to singular and plural classes. Paired singular-plural class numbers will be separated by hyphens. An exception in Swahili is Class 11/14, the result of a merger between two historically distinct classes, indicated by a slash; this class does not have its own 'corresponding plural'. Also, Cl. 9–10 arguably lack a synchronic prefix in Swahili, so are not used derivationally (see Contini-Morava, 2006).

[11] In repeater constructions the same form appears both in the function of specifier and noun (see, e.g., Aikhenvald, 2000, pp. 103–104; Enfield, 2004, pp. 120–121; Beckwith, 2007, pp. 101–102). Repeaters are found in, e.g., Lao (Tai), Thai (Tai) and Burmese (Tibeto-Burman), and are often used in construction with nouns which are not classified by classifiers 'proper'.

Table 3
Derivational uses of Swahili (Bantu) noun class prefixes (Contini-Morava, 2002, pp. 17–18).

Noun classes	Productive uses
Cl. 1–2 (*m-/wa-*)	agentive nouns from verb stems, e.g., *m-cheza-ji/wa-cheza-ji* 'player/s' (< *-cheza* 'play', including agentive suffix *-ji*.)
Cl. 3–4 (*m-/mi-*)	nominalized verbs referring to a verbal process, e.g., *mfuo* 'a hammering' (< *-fua* 'to hammer', including nominalizing suffix *-o*); extraordinary size, e.g., *m-kombe* 'very large cup' (< *ki-kombe* 'cup' [Cl. 7]), *mi-fedha* 'large amount of money' (< *fedha* 'money' [Cl. 10])
Cl. 5–6 (∅-/*ma-*)	deverbal nouns indicating result of a process, e.g., ∅-*wazo* 'idea' (< *-waza* 'think'); augmentatives, e.g., ∅-*toto/ma-toto* 'large child/ren' (< *m-toto/wa-toto* 'child/ren' [Cl. 1–2])
Cl. 7–8 (*ki-/vi-*)	deverbal nouns indicating implement associated with process, e.g., *ki-zibo/vi-zibo* 'plug/s' (< *-ziba* 'to plug up'); diminutives, e.g., *ki-toto/vi-toto* 'little child/ren' (< *m-toto/wa-toto* 'child/ren' [Cl. 1–2])
Cl. 11/14 (*u-*)	abstract nouns from adjectives and nouns, e.g., *u-refu* 'height/length' (< *-refu* 'tall/long'); *u-toto* 'childhood' (< *m-toto* 'child' [Cl. 1])

be stacked on a stem to derive complex meanings, e.g., *úhì-kó-ʔá:mɨ̀* (banana-SCM.SHAFT-SCM.LEAF) 'a leaf of a banana plant', *úhì-ʔó-βí:ùu* (banana-SCM.OBLONG-SCM.CHUNK) 'a chunk of a banana' (Seifart, 2004, p. 233).

Derivational use of classification markers in a borderline system between classifiers and noun classes is found in Australian languages of the Daly group.[12] For example, in Marrithiyel (Green, 1997) there are thirteen classifying 'generics', i.e., nouns with general meanings that can be either used as nouns in their own right or as classifiers, when used in conjunction with nouns that have more specific meaning (see also Sands, 1995; Aikhenvald, 2000, pp. 85–86; Wilkins, 2000). These are used both as the initial element in a Classifier–Noun sequence and preceding other nominal modifiers. Marrithiyel generics resemble noun class markers in that they are involved in concord and the term for a given entity is usually associated with only one marker. On the other hand, they resemble some classifiers in that they are relatively transparent semantically, and not all nouns in the language are classified. They are also morphologically diverse: some occur only as free forms, some primarily as dependent forms – either prefixes or proclitics, and some have both free and dependent alternants. In Marrithiyel the classification markers are only used with 'categories of presumably high cultural salience' (Green, 1997, p. 230). A usually unclassified noun root can occur with different classifiers to highlight a particular characteristic of the entity it usually denotes. Example (1) illustrates the creation of new lexical items from the nouns *wengi* 'cloud' and *miri* 'eye', either by way of noun class-like generics (in (a)) or noun classifier-like generics (in (b)):

(1) Use of generics in Marrithiyel (Australian) to create lexical items (Green, 1997, p. 231)

a.	*mi-wengi*	CLASS:EDIBLE PLANT-cloud	'red apple (tree)' (blooms at cloudy wet season onset)
	mi-miri	CLASS:EDIBLE PLANT-eye	'seed' (eye-shaped plant produce)
b.	*wudi miri*	NCLF:WATER eye	'waterhole, well' (water source with eye-like opening)
	sjenjsji miri	NCLF:FIRE eye	'glowing, hot central part of fire' ('eye' of the fire)

Green (1997, p. 231) describes this as a 'productive lexical pattern' and distinguishes it from "blackbird'-type constructions', i.e., from class terms based on Classifier + Adjective collocations.

Classifiers are also used derivationally in two types of complex systems: in languages with different nominal classification systems and in multiple classifier systems. The first case is found in Lao (Tai), which has numeral classifiers and class terms, which are realized as independent nouns as well as phonologically reduced and semantically more general prefixes (Enfield, 2004). The class terms have semantic properties also found in noun classifier systems, i.e., occupation, material and function. For example, a reduced form of the noun *mèè*^{1} 'mother' can be used to derive new nouns for female occupations, as in *mè*^{0}*-khaaw*^{3} 'nun' (cf. *khaaw*^{3} 'white'), *mè*^{0}*-caang*^{4} 'prostitute' (cf. *caang*^{4} 'hire someone's services') (Enfield, 2004, p. 136).

Another example of derivational use of noun classifiers in a language with different nominal classification systems comes from Mopan Maya. Mopan has both numeral classifiers and two noun classifiers that resemble gender markers except that not all nouns are classified and there is no concordial agreement. The gender markers can be productively added to Active Intransitive verb stems to render the agent of the action (see, e.g., Ulrich et al., 1978, p. 25).[13] Gender is not specified in Mopan person-marking pronouns, so using a masculine or feminine gender marker to render the agent also provides information about his/her sex (Contini-Morava and Danziger, 2011). For example in (2), the speakers have instructed a young woman to go and fetch water, and they have told her husband to go and chop wood. They then remark:

(2) Productive derivation by means of noun classifiers in Mopan (Mayan) (Contini-Morava and Danziger, 2011, data from Danziger; orthography of the Academía de las Lenguas Mayas de Guatemala (England and Elliott, 1990))

Tan-∅	*xa'ak-oo'*	*u*	*meyaj*	*kut'an-oo'*.
be.ongoing-3.UND.PRO	DISC-3.UND.PRO.PL	3.ACT.PRO	work	QUOT-3.UND.PRO.PL

[12] Derivational use of classifiers in Murrinhpatha is discussed in Walsh (1997, pp. 275–277); on the use of classification markers in Ngan'gityemerri for nominalization, see Reid (1997, p. 255).

[13] A transitive verb must first be intransitivized through object-incorporation, see *puut-ja'* 'draw-water' in example (2).

Tan-∅	***ix***	***puut-ja'-a***.
be.ongoing-3.UND.PRO	FEM	draw-water-ECHO
Tan-∅	***aj***	***si'-i***.
be.ongoing-3.UND.PRO	MASC	chop.firewood-ECHO

"So they're busy working', they said. '**Mistress water-drawer** is busy. **Mister woodchopper** is busy."

Derivational use of classifiers is also found in multiple classifier systems, where one set of morphemes is used in more than one morphosyntactic environment (cf. Aikhenvald, 2000, pp. 220–222). For example, classifiers in Arawakan and Tucanoan languages appear on the noun and provide more subtle semantic distinctions: 'these morphemes are used as derivational affixes and as noun class agreement markers, and could be analyzed as derivational or as inflectional' (Aikhenvald, 2000, p. 93). Classifiers in Tariana (Arawakan) are also used to nominalize a clause, as in *nawiki-sede-dapana* (people-NEG.EXIST-CL:HOUSE) (literally 'there are no people-house') 'house with no people' (Aikhenvald, 2003, p. 102). Classifiers in multiple classifier languages can also be used as relativizers (see, e.g., Barnes, 1990, p. 286, on Tuyuca (Tucanoan)).

As mentioned above, noun class/gender differentiation can be used to signal patterns of form-meaning relationship. Whether such cases should be analyzed as separate, but semantically related stems or as a single stem with a more abstract meaning does not affect this point.[14] The cross-class pairings may not be fully productive, but they attest to salient conceptual relationships. For example, Ferrari (2005) provides the examples in Table 4 of recurring relationships between noun stems with masculine vs. feminine gender in Italian (we have slightly reorganized and relabeled her categories).

Similar regularities are documented for Spanish and Romance more generally by Pountain (2005), who points out that in Spanish the tree:fruit distinction is productively applied to loanwords such as *aceituna/aceituno* 'olive'/'olive-tree', from Arabic (p. 332). Pountain argues that 'gender can be used in nouns which inherently refer to inanimates to encode semantic contrasts relating to features other than sex precisely because there is no risk of such nouns having an animate reading' (p. 330).

The tree:fruit distinction is a common exploitation of noun class/gender differentiation, found in genetically unrelated languages. This may also reflect a shape distinction, as trees/plants may be classified with long and thin things while fruits may be classified with round or three-dimensional things. In Swahili, for example, names of plants are usually in Cl. 3–4, whereas names of the associated fruits are usually in Cl. 5–6, as in *m-boga* 'gourd plant' (Cl. 3) vs. *∅-boga* 'gourd' (Cl. 5). Similarly to the example given above from Spanish, this pattern is pervasive enough to be extended to many loanwords designating plants, even if the source word did not begin with *m-*, as in *m-papai* 'papaya plant' (Cl. 3) vs. *∅-papai* 'papaya' (Cl. 5) (< Hindi *papai*) [data from ECM].

A slight variation on this theme is found in Arapesh (Papuan), where the terms for trees are spread over several different classes, but related terms for fruits are derived by placing the noun in the *-m/ip* class (Class V), which is the class of the general word for fruit (Fortune, 1942, p. 43). For example, *iluḥ* (Class XIII) 'type of breadfruit tree', *ilum* (Class V) 'breadfruit', *jahakụ* (Class IV) 'pometia pinnata', *jahawem* (Class V) 'fruit of pometia pinnata'.[15]

The use of gender differentiation to suggest size differences, as in several of the Italian examples in Table 4, is also common cross-linguistically. However, larger size can correlate with either gender, as pointed out by Aikhenvald (2012). For example, unlike Italian, in Hindi-Urdu it is masculine that is associated with larger size and feminine with smaller size, as in Table 5.

Another common pattern reflected in the Italian examples is the use of one class/gender for a more general or collective meaning as opposed to a more specialized, individuated meaning associated with a different class/gender, as in the examples from Modern Hebrew in Table 6 (for further discussion of the use of gender for individuation, see Section 4.3 below).

Table 4
Semantic relationships among nouns in Italian (based on Ferrari, 2005, pp. 39–40).

	Masculine	Feminine
Count:mass	*ferramento* 'iron tool'	*ferramenta* 'hardware'
	granolo 'grain'	*granola* 'the sifted whole wheat grains'
Individual:collective	*raccolto* 'harvest/crop'	*raccolta* 'harvesting, collection'
	rancio 'ration'	*rancia* 'distribution of the 'ration'
Small:large	*mestolo* 'small ladle'	*mestola* 'big ladle'
	terrazzo 'balcony'	*terrazza* 'terrace'
Inanimate:animate	*ciuccio* 'pacifier'	*ciuccia* 'breast'
	lucciolo 'sequin'	*lucciola* 'fire-fly'
Tree:fruit	*melo* 'apple tree'	*mela* 'apple'

[14] Similar examples are discussed by Corbett (1991, p. 182), who cites French *la trompette* 'the trumpet (fem.)' vs. *le trompette* 'the soldier who plays the trumpet (masc.)' and describes these as 'two separate, though related nouns and not a case of double gender'.

[15] Fortune also included terms for leaves, which are in Class IX, but Dobrin (2013, p. 39) notes that the leaf terms apparently involve a possessive construction based on the associated tree term, so would not count as a derivational use of noun class assignment per se. Thanks to Lise Dobrin (p.c.) for her help with the Arapesh examples.

Table 5
Gender and size in Hindi-Urdu (Peter Hook, p.c.).

Masculine	Feminine
ɖabbaa 'box'	*ɖabbii* 'little box'
ghaŋʈaa 'bell'	*ghaŋʈii* 'small bell'
jholaa 'bag'	*jholii* 'bag or wallet'
laaʈhaa 'large club'	*laaʈhii* 'club, nightstick'
lakaɽaa 'log'	*lakaɽii* 'stick'
paʈʈaa 'strap, belt'	*paʈʈii* 'ribbon, cloth strip'

Table 6
Derivational use of gender in Modern Hebrew (Yishai Tobin, p.c.).

Masculine	Feminine
se'ar 'hair'	*se'arah* 'a single hair'
matan 'giving, present'	*matana* 'gift, present'
xofesh 'freedom (also vacation)'	*xufsha* 'only vacation/leave'
z(e)man 'time, season, term'	*z(e)mana* 'tempo'
yaxas 'attitude, relation, treatment, proportion'	*yexasa* '(grammatical) case'

A more abstract way in which gender differentiation can structure related concepts in the lexicon is discussed by Zubin and Köpcke (1981, 1986), who apply the principles of categorization proposed by Rosch (1977) to account for the different behavior of neuter and masc./fem. genders within lexical fields in German. The authors draw on the description of neuter gender by Grimm (1890 [1831]), and point to the more general sense of the term *Geschlecht* as 'position in a hierarchical categorization'. For example, neuter gender expresses generality and collectivity as the undeveloped or undifferentiated category, being 'reserved for higher level taxa that have greater internal heterogeneity and consequently no general image for a prototypical member' (Zubin and Köpcke, 1986, p. 167). Accordingly, German superordinate terms are more likely to be neuter, e.g., *das Tier* 'animal', as opposed to lower-level terms assigned a non-neuter gender, i.e., basic level terms, e.g., *der Fisch* 'fish', *der Vogel* 'bird', and subordinate terms, e.g., *der Karpfen* 'carp', *die Eule* 'owl' (Zubin and Köpcke, 1986, p. 148). The contrast between neuter and non-neuter gender can also distinguish between a holonym and the subordinate meronyms, as in *das Gesicht* 'face' vs. *der Mund* 'mouth', *die Nase* 'nose', *das Auge* 'eye' (Zubin and Köpcke, 1986, p. 170).[16] Zubin and Köpcke (1986, p. 174) further argue that there may be a conflict between the functional motivation of grouping together entities that have similar functional or perceptual characteristics, which motivates use of neuter for superordinate terms, and using the gender system to differentiate among entities that may be referred to in similar discourse contexts, which motivates use of all three genders for maximum differentiation. Thus *das Auge* 'eye' in the example just given is taxonomically subordinate to *das Gesicht*, yet is neuter.

In summary, lexical stems may be used with different classification markers to express different meanings, which increases the lexical inventory of a language. In some cases these patterns are systematic enough that one can regard reclassification of a nominal stem as derivational; in others the patterns may be less regular but nevertheless reflect the use of class/gender for grouping and differentiation of related concepts. In either case one may question whether we are dealing with the same nominal stem or a different stem that is similar in form and meaning, but the patterns can be detected without resolving this question. In the next section we focus on examples where the meaning of the noun may be seen as neutral and differentiation is provided by classification markers. This also serves to expand the power of the lexicon, not by creating new lexical items as in the functions discussed above, but by using the grammar to enrich lexical meaning.

4.2. Differentiating referents

Nominal classification can be used to provide more detailed information about lexical items whose meanings are neutral, or unmarked for distinctions made by the classification markers. Rather than creating new lexical items as in the derivational function discussed earlier, in this case the classification markers create more finely differentiated interpretations of existing lexical items.[17]

One extremely common example of the differentiating function is the use of gender markers with an otherwise gender-neutral noun to indicate sex of the referent. This is often very productive with noun stems denoting humans, and is sometimes extended also to animals. With inanimates, variable gender classification may be less regular, though still reflecting semantic differentiation between related concepts (see Section 4.1), or it may be used to express a speaker's attitude toward

[16] Zubin and Köpcke's examples appear to contradict Aikhenvald's (2000, p. 316) statement that the assignment of nouns to genders hardly ever involves relationships of taxonomic inclusion.

[17] The term 'common gender' is often used to describe this phenomenon. For example, according to Corbett (1991, p. 181), '[c]ommon-gender nouns normally take different agreements for semantic or pragmatic reasons'.

a referent (to be discussed in Section 4.4). Other differentiating functions, usually expressed by classifiers, include attributing to the referent a wide range of properties such as animacy, physical properties or social status.

As mentioned earlier, the distinction between subcategorizing undifferentiated lexical items and creating new lexical items is not always easy to draw.[18] In general, the latter yields more idiosyncratic, unpredictable lexical meanings, whereas the former is more productive and predictable, as in the examples to follow. We begin with the use of noun classes for referent differentiation and then move on to examples of classifiers.

Variable gender assignment can be exploited to differentiate referents in semantic systems with overt marking on the noun. This may be a property of only certain groups of nouns. For example, in Mohawk (Iroquoian) nouns referring to humans do not have an inherent gender. The sex of the referent is indicated by prefixed gender markers *r-* and *iak-*, as in *rón:kwe* (person.MASC.SG) 'man' vs. *iakón:kwe* (person.FEM.SG) 'woman' (Bryant, 2003, p. 22).

In some languages variable gender assignment is employed with both animates and inanimates, in which case it indicates sex differentiation among animates and physical properties such as size among inanimates. For example, in Kxoe (Khoisan) most noun stems can be assigned to any gender, as a result of which Heine (1982, p. 198) refers to gender in Kxoe as a 'free gender system'. If the referent is animate, masculine and feminine indicate sex, whereas for inanimates they indicate large size/long shape or small size/round shape respectively, in what Köhler (1981, p. 515) calls 'une symbolique sexuelle élargie', as in the following examples:

(3) Gender differentiation in Kxoe (Khoisan) (Köhler, 1981, pp. 514–515)

a. */õǻ-mà* 'boy, son' masc. vs. */õǻ-hɛ̀* 'girl, daughter' fem. vs. */õǻ(-'à)* 'child' indef./neut.
b. *ŋgú-mà* 'big, rectangular hut' masc. vs. *ŋgú-hɛ̀* 'small, round hut' fem. vs. *ŋgú* 'hut' indef./neut.

Similar use of gender to specify sex and physical properties has been reported from other languages, such as Maasai (Eastern Nilotic) (Payne, 1998; Hurskainen, 2000, p. 682) and Alamblak (Sepik) (Bruce, 1984, p. 97). Aikhenvald (2012, p. 49) states that in Manambu (Sepik) gender choice can express relative size and quantity, and so supplements the paucity of comparative constructions.

In noun class languages class membership is relatively conventionalized (aside from variable assignment just discussed). That is, as mentioned in Section 2.3, most nouns are assigned only to one class or gender. Conventionalization of assignment of nouns is motivated by the use of noun class/gender markers on elements other than the noun: for the purposes of anaphora and grouping of modifiers with the appropriate modifieds (see Section 5.1 below), it is easier to identify the antecedent if the assignment of nouns to classes is relatively predictable. In general, use of classification markers to convey different perspectives on the referent is associated with classifiers rather than noun class markers. However, Singer (2010) shows that in a language with semantically motivated noun classes, choice of noun class marker can differentiate between senses of a noun. Mawng (Iwaidjan), an Australian language, has a semantically motivated gender system with gender indexed both within the NP and in pronominal prefixes on verbs. According to Singer, change of gender marking can result in creative construals of a referent. For example, in 'material-product agreement' an entity can be viewed as (potential) material for a human product: the noun *jampakang* 'corrugated iron', normally Masculine gender like other European artifacts, takes Edible gender marking when viewed as a building material (Edible gender includes items associated with housing) (Singer, 2010, p. 397).

As mentioned above, the function of conveying different perspectives on a referent is most often associated with languages that make use of sortal classifiers, which allow greater latitude for nouns to be used with different classifiers, tapping on semantic criteria such as animacy, physical properties, social status and function. By way of such variable classification, classifiers can add information otherwise unavailable in the noun, highlight an aspect of its meaning or provide unusual information. For instance, in the following examples from Mandarin (Chinese), different numeral classifiers lead to different interpretations of the noun:

(4) Differentiation by means of classifiers in Mandarin (Chinese) (Hsin-hsin Liang, Yucheng Gan and Xiaoran Yu, p.c.)

a. *yī* *tái* *diàn-huà*
one NUM.CLF:MACHINE telephone
'one telephone [i.e., piece of machinery]'
b. *yī* *zhǒng* *diàn-huà*
one NUM.CLF:TYPE telephone
'one kind of telephone [e.g., cordless]/kind of phone call [e.g., for New Year greeting]'
c. *yī* *kuǎn* *diàn-huà*
one NUM.CLF:STYLE telephone
'one style/model of telephone'

[18] For example, Corbett (1991, p. 67) describes Catalan *clau* 'nail (masc.)' and *clau* 'key (fem.)' as 'two lexical items, which share the same phonological form', and contrasts these with 'motion nouns' such as Spanish *hijo* 'son (masc.)' and *hija* 'daughter (fem.)', which he describes as 'two separate nouns, sharing a similar stem but with different inflections'. We would include Spanish *hij-* in the category of a semantically neutral lexical item that can be further differentiated by means of gender marking.

d. *yī* *tōng* *diàn-huà*
one NUM.CLF:COMMUNICATION telephone
'one phone call'

e. *yī* *ge* *diàn-huà*
one NUM.CLF:GENERAL telephone
'one telephone/phone call' [depends on context]

Huang and Ahrens (2003, p. 360) discuss similar examples and argue that 'contextual information [such as a classifier] will 'coerce' a sense by eliminating other possible interpretations in a richly encoded but under-specified lexicon'.

Example (4) above brings up the controversial question of the respective semantic contributions of numeral classifier vs. noun in pseudopartitive constructions. There are three related issues: (a) what is meant by 'classification', (b) the degree of flexibility in classifier–noun pairings, and (c) the apparent redundancy of classifiers that express semantic properties that are inherent in the meaning of the noun. With regard to (a), some scholars (e.g., Lehman, 1990, p. 89, fn.) argue that 'classification' should mean a relationship of taxonomic inclusion between classifier and noun. This definition would exclude examples such as 4(b) and 4(c) above on the grounds that 'telephone' is not a hyponym of 'kind' or 'style'. Beckwith (2007, pp. 99–100) takes this position also with regard to general classifiers like *ge* in 4(e), and with regard to repeaters, which are identical in form to the noun (cf. fn. 11 above), stating that such forms 'do not classify' from a semantic point of view, and in this respect resemble gender markers in Indo-European languages (p. 107). Some scholars distinguish between different types of classifiers with regard to their semantic contribution. For example, Downing (1996, pp. 91–92) argues that 'kind' classifiers, i.e. specific classifiers based around exemplar nouns, e.g., *ken* for buildings in Japanese, are less suited to add information to that given by the noun than 'quality' classifiers, which are based on a feature, e.g., *hon* 'long, slender'. However, Aikhenvald (2000, p. 320) suggests that specific (or 'kind') classifiers 'can also add information about the referent, since they allow speakers to distinguish one sense of the referent from all the others'. From this point of view even a general classifier contributes to semantic interpretation, since more specific alternatives could have been chosen: the general classifier can only be used to suggest the most obvious interpretations of the associated noun, as in (4e).

With regard to the question of flexibility in noun-classifier pairings, Beckwith (2007, pp. 103ff.) regards the pairings as relatively fixed, and analyzes the different interpretations of nouns as homonyms each of which agrees with a different classifier (see also Lehman, 1979; Hundius and Kölver, 1983; Kubo, 1996). On the other hand, some native speakers such as H. Zhang (2007) and Huang and Ahrens (2003) argue that the meaning of the noun is relatively unspecific, so the classifier points to one rather than another interpretation. Zhang (2007, p. 48) argues that flexibility of classifier use is especially important for referents that may take different shapes. For example, the Mandarin word 'moon' is used with the classifier for round things when referring to a full moon, as in *yi lun yueliang* (one NUM.CLF:ROUND moon), and with a classifier for curved/bending things when referring to a crescent moon, as in *yi wan yueliang* (one NUM.CLF:CURVED moon).

With regard to the issue of redundancy (see, e.g., Greenberg, 1972), Zhang (2007, p. 51) argues that numeral classifiers in Mandarin not only play a quantifying role but also specify the meaning of nouns and convey stylistic effects, in view of the lack of referential precision of nouns: '... a noun entity may have shifting and different semantic references, and it is often through the use of a particular classifier that the meaning becomes clear and specified.' Similarly, Wilkins (2000, p. 189) argues that generics in Arrernte (Pama-Nyungan) are not redundant but rather single out certain 'knowledge structures' connected to the associated specific noun.

The respective semantic contributions of classifier and noun may not be self-evident, as argued by Senft (2000, pp. 36–38; 2007, Section 2.3). Wilkins (2000, Sections 4–5) argues with regard to Arrernte that in a generic–specific construction, both the nouns and the construction itself are separately meaningful, and all contribute toward the interpretation. Regardless what position one takes on this question, it is clear that different noun + classifier pairings contribute to expansion of the lexicon, either by creating sets of semantically related nouns with the same phonological form, or by highlighting one rather than another interpretation of a single form.

Variable classification has been documented for all types of classifiers. The semantic effect of classifier choice depends on the properties of a given system. For example, different relational classifiers can be used with the same noun to indicate various types and degrees of possession.[19] These include, e.g., different ways in which an item can be handled, such as consumable, edible or drinkable; valuable possession; degree of kinship, as well as degree of control over the relationship between the possessor and possessed item. Since relational classifiers are restricted to alienable possession, with no classifier used for inalienably possessed items, e.g., body parts and kinship terms, the presence or lack of classifier can also be used to indicate type of possession. For example, in (5) the noun *paŋana* 'head' in Manam (Oceanic) is used without a classifier in the sense of a body part, while two relational classifiers distinguish between alimentary and general possession:

[19] See Rehg (1981, p. 183), Lichtenberk (1983, pp. 150–166), Lichtenberk (2005, pp. 340–341), Senft (1986, pp. 49–54), and Senft (1996, pp. 18–20).

Table 7
Variable classification by classificatory verbs in Bearlake (Athabaskan) (Rushforth, 1991, p. 254).

Example	Gloss
Lidí seghánịchu	'Hand me (a single box or bag) of tea'
Lidí seghánịwa	'Hand me (boxes or bags) of tea'
Lidí seghánịhge	'Hand me (a cup or other shallow, open container) of tea'
Lidí seghánịhxo	'Hand me (some, a handful of loose) tea'
Lidí seghánịhxe	'Hand me (a deep, closed container) of tea'

(5) Variable classification by relational classifiers in Manam (Oceanic) (Lichtenberk, 1983, p. 158)

a. *paŋana* *-gu*
head my
'my head (body part)'

b. *paŋana* *ʔana* *-gu*
head REL.CLF:ALIMENTARY.POSSESSION my
'my head (e.g., fish head, for my consumption)'

c. *paŋana* *ne* *-gu*
head REL.CLF:GENERAL.POSSESSION my
'my head (e.g., the head I found, cut off, etc.)'

In languages with classificatory verbs, physical properties of the object are reflected in the form of verbs denoting handling objects.[20] The examples from Bearlake (Athabaskan) in Table 7 show how the noun *lidí* 'tea' appears with different roots of the verb 'to hand', depending on the characteristic focused upon, such as shape, number, consistency and containment.

The less common deictic classifiers can also be used to contribute information about a noun. Siouan languages of the Dhegiha branch possess deictic classifiers which appear as definite articles or as compounds with deictic particles (Rankin, 2004). Twelve classifiers categorize the referent of the noun for animacy, shape and position (both for animates and inanimates), actor, number and motion (for animates), and arrangement (for inanimates).[21] Variable classification can be used to contribute information involving these semantic distinctions; the changes in meaning can be subtle, as in the following example:

(6) Variable classification by deictic classifiers in Omaha-Ponca (Siouan) (Rankin, 2004, p. 213)

a. *ą́ba* *the*
day DEICTIC.CLF:STANDING.INAN
'the day'

b. *ą́ba* *ge*
day DEICTIC.CLF:SCATTERED
'the days'

c. *ą́ba* *khe*
day DEICTIC.CLF:LYING.INAN
'the day just prior to sunrise'

d. *égiðe* *ą́ba* *akhá* *ugą́ba* *amá*
then day DEICTIC.CLF:ACTOR.SG.ANIM give.light EVIDENTIAL
'At length the day gave light, they say.'

The unmarked article for 'day' is the standing, inanimate article as in (a) 'because it is associated with the sun high in the sky ... or because it is an abstract noun and therefore goes into the unmarked class' (p. 213); in (b) the noun appears with the scattered/individuated plural article to suggest 'the separate psychological status of each time period' (p. 213); in (c) the article for long/horizontal inanimates is used for the period very early in the morning, just prior to sunrise; and finally in (d) the noun is understood as an agent.

[20] Variable classification is also found in existential verbs in Enga (Engan) (Lang, 1975, pp. 56–57; Foley, 1986, p. 90) and Qiang (Tibeto-Burman) (LaPolla and Huang, 2003, p. 134), and in classifiers realized as verbal prefixes, as in Haida (isolate) (Enrico, 2003, pp. 24–25) and Imonda (Waris) (W. Seiler, 1986, pp. 201–202).

[21] The languages also have locative classifiers in the form of compounds of definite article and locative morphemes. Both types of classifiers have developed from grammaticalized verbs 'sit', 'stand', 'lie', 'move' (Rankin, 2004).

As shown by these examples, markers of classification may be used to add information about a given referent that the noun itself leaves unspecified. Distinctions which would otherwise be conveyed by separate lexical items can be realized by reusing lexical forms with different classification markers. As a result of this, in a classifier language a given concept may be expressed grammatically rather than by means of a dedicated lexical item (Aikhenvald, 2000, p. 268). We now turn to an important function found with both noun classes and classifiers, that of individuation.

4.3. Individuation

Each of the subtypes of semantic functions that we have identified so far subsumes a variety of specific semantic effects, such as indicating sex, relative size, and the like. Individuation is a particular semantic effect that is found on both sides of the noun class-classifier divide, and also interacts with the grammatical category of number. On the noun class side, markers of noun class/gender usually signal information about number as well as class. This linkage is noted by H. Seiler (1986, p. 125), who states that it 'reflects the intimate relationship between the generalizing principle [by which objects are partitioned into classes] (gender) and the individualizing principle (number), which is characteristic for the entire dimension [of apprehension of the object]' (see also Contini-Morava, 2000). On the classifier side, it has been suggested that classifiers have an individuating function, allowing nouns to be conceived as countable objects (see, e.g., H. Seiler, 1986, pp. 77, 97). We have therefore devoted a separate section to individuation. However, examples falling in this category do not necessarily fit into just one subtype. Thus some of the Italian data discussed in the 'expansion of the lexicon' section (see Table 4) could have been included here, but we chose to keep the data together in that section in order to show the larger patterns of cross-gender relationships in Italian. In this section we provide further examples of use of classification markers for individuation, which may fall into more than one functional subtype.

The link between gender and individuation is demonstrated by a number of related phenomena in Indo-European languages, where gender is used to distinguish between individuated and non-individuated senses of a noun (see, e.g., Morris, 2000; Siemund, 2008; Kraaikamp, 2012 on Germanic languages). For example, in Central Italian dialects the count:mass distinction is expressed by way of masculine vs. neuter gender, as in *lu pane* 'the piece/loaf of bread' (masc.) vs. *lo pane* 'the bread (e.g., on the table)' (neut.); *lu pesce* 'the (live) fish (e.g., in an aquarium)' vs. *lo pesce* 'the fish (to eat)' (Haase, 2000, p. 226).

The effect of individuation is also found in the choice of an anaphoric pronoun. An example is provided by the extent of mismatches between classification of the noun by way of determiners and classification of the referent by way of pronouns in Dutch. Audring (2013) shows how masculine or common gender pronouns are used for discrete and countable referents, while a neuter pronoun is used for unbounded and uncountable referents. According to her, such variation in pronoun choice is possible for 'virtually' all Dutch nouns (p. 41). This is illustrated in example (7), which comes from a magazine of a Dutch supermarket chain. In (a) the common gender noun *rijst* 'rice' appears in a sort reading with a relative and demonstrative pronoun that match its lexical gender, while in (b) the referent described by the same noun is identified in a different context by a neuter pronoun when the author discusses the benefits of rice in general:

(7) Pronoun variation and individuation in Dutch (Audring, 2013, p. 39)

a. *Albert Heijn heeft nu* ***een*** ***rijst*** ***die*** *een nieuwe betekenis*
Albert Heijn had now INDEF.SG rice.CM.SG REL.PRO.CM.SG a new meaning
aan het woord snelkook-rijst gaat geven.
to the word instant rice goes give
Deze *hoeft niet in een pan maar in de magnetron*
DEM.CM.SG needs not in a saucepan but in the microwave
'Albert Heijn now has a rice that will give a new meaning to the word *instant*. It does not have to go into a saucepan but can go into the microwave.'

b. ***Rijst*** *heeft ontzettend veel voordelen:* ***het*** *is snel klaar, . . .*
rice.CM.SG has extremely many advantages PRO.NEUT.SG is fast done
'Rice has a great many advantages. It is done quickly, . . .' (*Allerhande*, 9, 2006)

Audring (2013, p. 39) argues that such pronominal mismatches are contextually based and do not simply reflect nominal semantics: '. . . the count-mass sensitivity of pronoun usage stems from spur-of-the-moment construal of the situation rather than from a lexical source.' At the same time, Kraaikamp (2012) points out that a distinction in terms of degree of individuation is also pervasive in the Dutch lexical gender system: higher individuation is characteristic of common gender nouns in contrast with neuter gender nouns, which tend to be less individuated.

Individuation is regarded as one of the key semantic functions of numeral classifiers. As mentioned in Section 2.3, in languages that employ numeral classifiers (often called 'classifier languages'), a pseudopartitive construction including a classifier is required whenever a noun is to be enumerated (and sometimes also with other types of specification such as demonstratives), as in Mandarin *yí-liàng jiǎotàchē* 'one-NUM.CLF.VEHICLE bicycle'. By contrast, in a 'non-classifier language' such as English, a pseudopartitive construction is only required when enumerating mass nouns or pluralities, e.g. *two slices of*

bread, a pack of wolves.[22] It has often been proposed (see, e.g., Greenberg, 1972; Denny, 1986; Dik, 1987; Chierchia, 1998) that classifier and non-classifier languages differ with respect to the conceptual status of nouns. The idea is that nouns in classifier languages are like mass nouns in a non-classifier language in that they also need to be unitized in order to be counted. The function of unitizing or individuating is usually ascribed to the accompanying classifier, or to the pseudopartitive construction that includes one.

For example, Lucy (1992, 2000) argues that classifiers play an individuating role in Yucatec (Mayan). In Yucatec, nouns are not specified as to unit and must be unitized in order to be used with a numeral. For instance, the noun *kib'* is unitized by a numeral classifier: *'un-tz'íit kib'* (one-NUM.CLF:LONG.THIN wax) 'one long-thin candle' (Lucy, 2000, p. 331). Lucy argues that the noun *kib'* should not be glossed as 'candle', since this suggests that the numeral classifier *tz'íit*, used for long and thin objects, is redundant. Instead, the classifier contributes to reference by individuating the noun and indicating the shape of the referent. Therefore, both the noun and the classifier contribute to reference, indicating the identity and the individuation status of the referent, respectively.

Although Lucy (1992) is careful to provide evidence of the conceptual status of nouns in Yucatec that is independent of the use of classifiers for enumeration of countable entities, claims that classifier languages in general lack a count/mass distinction (and consequently a conceptual distinction between objects and substances, as suggested by Quine, 1960) often appear to rest on that grammatical fact alone. A number of scholars take issue with this (e.g., Hundius and Kölver, 1983, Section 1.3; Beckwith, 2007, pp. 20–24, 91–93). From the point of view of formal syntax, Cheng and Sybesma (1999) and Li (1999) argue that there is a distinction between count and mass nouns in Chinese which is reflected in different syntactic behavior. Imai (2000), Imai and Gentner (1997), and Imai and Mazuka (2007) provide psycholinguistic evidence that a conceptual distinction between count and mass nouns exists for speakers of Japanese. Nevertheless, they also show that language structure does play a role in speakers' construal of entities as objects vs. substances even in non-linguistic tasks, and that this effect becomes more pronounced with age.

Firm conclusions about the conceptual status of nouns in classifier languages must await more detailed research, and as with the related question of the respective semantic contributions of classifier and noun discussed in Section 4.2, there is not likely to be a single answer to this question. However, the fact that constructions involving numeral classifiers play a role in explicitly individuating referents for the purpose of quantification is not in dispute. As pointed out by Downing (1996, p. 212), the function of individuation can be achieved even if the classifier itself is regarded as 'semantically empty'.

Related to the issue just discussed is the oft-cited relationship between obligatory use of numeral classifiers and lack of obligatory pluralization in numeral classifier languages, following Greenberg (1972) and Sanches and Slobin (1973). Greenberg described this as a statistical generalization, but Sanches and Slobin stated that these phenomena are in complementary distribution cross-linguistically. Aikhenvald (2000, pp. 100, 249) describes several languages as exceptions, having both numeral classifiers and obligatory number marking, such as Arawak (Arawakan), Nivkh (isolate), and Ejagham (Benue-Congo). However, number marking is not obligatory for non-human count nouns in Arawak (Taylor, 1976), while in Nivkh it is only found regularly with countable nouns in subject position (Gruzdeva, 2004, p. 300). In Ejagham the numeral classifiers are used only with some nouns (Watters, 1981, p. 313). The question whether obligatory numeral classifiers are indeed in complementary distribution with obligatory number marking on nouns, and if not, what functions numeral classifiers serve in languages with obligatory number marking, deserves further exploration. If they do indeed co-occur, it seems likely that they serve different discourse functions, as Downing (1996, Chapter 7) shows for classifier phrases vs. optional number marking in Japanese.

In summary, all types of nominal classification may be used to indicate a distinction between individuated and non-individuated entities. In noun classification systems, different genders/classes may be associated with different degrees of individuation. In classifier systems where nouns are not obligatorily marked for number, a phrase that includes a classifier indicates that the (referent of the) associated noun is to be treated as individuated for the purpose of counting or deictic reference.

4.4. Ascribing properties to referents

Finally, nominal classification can be used to express information about a speaker's attitude toward the referent. Change of noun class or classifier can convey affection, upgrade or downgrade the referent's status, as well as animate and personify an inanimate referent.[23] This function is frequently exploited in stories, legends and jokes.

For example, many Bantu languages have special noun class prefixes used to derive diminutives or augmentatives from nouns conventionally assigned to other classes, often with associated connotations of affection or contempt. In some languages, such as Swahili, existing noun class prefixes (Classes 7–8 and 5–6, respectively, cf. Table 3 above) can be re-employed for these functions. Augmentative forms of the nouns *mtoto* 'child' and *baba* 'father' are illustrated in (8), along with augmentative rather than animate concords. The resulting message is one of contempt:

[22] Beckwith (2007, pp. 160–161 et passim) objects to the term 'classifier languages' on the grounds that words like *slice* and *pack* serve the same grammatical function as so-called 'true' classifiers. He proposes the alternative term 'phoronym-dominant specifying' languages. This is a valid point, but we use the more familiar terminology here because change of terminology would not affect the sets of languages that are subsumed in the two categories.

[23] Similar points are made by Clamons (1992, 1993), who also distinguishes between the use of variable gender assignment to either differentiate referents or indicate evaluation of the referent, based on examples from Oromo (East Cushitic) as well as other noun class/gender and classifier languages.

(8) Use of derived augmentatives with augmentative concord for contempt in Swahili (Bantu) (Mohamed, 1990, p. 34; ECM's translation)

'Kwani	*huu*	*mfereji*	*wako?'*	*'Wa*	*babaako,*	*kama*	*unaye;*
because	this	faucet	yours	of	your.father	if	you.have.one
haya	***ma**-toto*	***ya**-na-**yo**-zaliwa*			*njia-ni,*		
these.AUG.PL	AUG.PL-child	AUG.PL.SUBJ.PFX-PRESENT-AUG.PL.REL.PRO-be.born			street-LOC		
nd'o	***ya**-li-vyo*	*hivi.*	***Ya**-ta-m-heshimu*				*nani;*
emph.COP	AUG.PL-COP-manner	thus	AUG.PL.SUBJ.PFX-FUTURE-ANIM.SG.OBJ.PFX-respect				who
mama	*mmoja*	***ma**-baba*	*ishirini.'*				
mother	one	AUG.PL-father	twenty				

'Why, is this water faucet yours?' 'Your father's, if you have one; **these kids that are born** in the street, that's how **they are**. Who **will they respect**; one mother, twenty **fathers**.'

In Nama (Khoisan) change of gender can be used to attribute properties to referents. Inanimate nouns are inherently assigned to either masculine or feminine gender (Hagman, 1977, pp. 22–26). In this respect Nama differs from Kxoe, in which noun stems do not appear to have inherent gender (see example (3) above). Any inanimate noun 'may be used with the suffix of the other gender to express that there is something unusual about the referent' (p. 23), such as size and often derogation (see Table 8).

A further example of the use of gender reversal to express affective messages comes from Modern Hebrew, termed 'cross-addressing' by Tobin (2001). Females can be addressed by close friends, relatives, associates, and partners (either male or female) with masculine pronouns and verb morphology, often accompanied by a 'baby talk' intonation, and they may refer to themselves this way as well. This may be 'a sign of affection, intimacy, and solidarity' (Tobin, 2001, p. 187). For example, in (9) below two twin sisters, who have been punished by being sent to their room, use masculine forms in (a) as a sign of solidarity. Gender reversal can also have an opposite effect, as in (b), where on another occasion they use masculine forms to express insult:

(9) Gender switch to indicate affection and insult in Modern Hebrew (Tobin, 2001, p. 188)

a. *rotseh* *lesaxek?*
want.MASC.SG to.play
'Ya wanna play?'

lo,	*aval*	*tixtov*	*mixtav*	*le-aba*	*ve-tivakesh*	*slixa*
no	but	write.MASC.SG	letter	to-daddy	and-ask.MASC.SG	sorry

'No, but write a letter to Daddy and apologize.'

b. *metumtam!* *mefager!* *tafsik!* *bo* *kvar!*
moron.MASC.SG retard.MASC.SG stop.MASC.SG come.MASC.SG already
'Moron! Retarded! Stop it! Come on already!'

It is interesting to note that in some languages cross-addressing can go in either direction and be used by speakers of either gender. For example, Ferguson (1964, pp. 106, 109) mentions the use of gender change as a mark of endearment by speakers of both sexes in baby talk in Arabic and Marathi (Indo-Aryan). Further, Aikhenvald (2012, p. 70) reports that in Amharic (Afro-Asiatic), addressing a woman with a masculine pronoun indicates admiration, whereas addressing a man with a feminine pronoun indicates insult.

Gender switch can also be used to focus on an unusual physical property of a referent. This is illustrated by the semantic gender system in Manambu (Sepik) (Aikhenvald, 2012). In Manambu humans are assigned to masculine and feminine gender depending on sex, while the gender of animates is based on size and shape (and occasionally on sex). In contrast, inanimates have no inherent gender: the assignment of concrete nouns depends on size and shape, with long and large objects being masculine, and small and round ones being feminine, and the gender of abstracts is based on such properties as intensity, duration and extent. Gender can thus be used to focus on literal or metaphorical size or shape, as in *val* 'canoe', which appears with masculine agreement when big, and feminine when small (p. 45). Likewise, *ab* 'head' is normally feminine

Table 8
Gender reversal in Nama (Khoisan) (Hagman, 1977, pp. 23–24).

Feminine	Masculine
'oms 'the house'	*'om-i* 'the big house, apartment, office building'
péns 'the unusually fat pen'	*pén-i* 'the pen'
sams 'the breast'	*sam-i* 'the big ugly breast'
xa˜as 'the penis'	*xa˜ap* 'the small penis'

due to its round shape; however, the noun '... may be treated as masculine when a person has a headache, since the head then feels heavy and unusually big.' (p. 47). This can also be applied to human beings: in casual conversation, feminine gender can be used as an insult for a 'smallish, fat, womanlike man', as in *kə numa du* (this.FEM.SG big.FEM.SG man) 'this fat, round man', while masculine gender can be used with a derogatory effect for a woman considered 'boisterous, large in size, and also imposing', as in *kə-də numa-də ta:kw* (this-MASC.SG big-MASC.SG woman) 'this (unusually) big, boisterous or bossy woman' (pp. 53–54).

Classifiers can also be exploited to express affective messages. Bengali (Indo-Aryan) constitutes an interesting case where certain classifiers are historically derived from gender markers. According to Barz and Diller (1985, pp. 167–168), the classifiers *ṭi* and *ṭa* are gender markers which have been reanalyzed 'as a rather vague semantic opposition between small-nice-likeable and large-coarse-devalued' (reminiscent of the contrast between certain masc./fem. noun pairs in Hindi, cf. Table 5). Thus for example the noun 'book' may be classified either as *boi-khana* (book-NUM.CLF:FLAT.RECTANGULAR) 'the book (the slab-like physical object)', *boi-ṭi* (book-NUM.CLF:COUNT.SMALL) 'the book (the nice little one)', or *boi-ṭa* (book-NUM.CLF:COUNT) 'the book (the big boring volume I must read)'. Another notable fact about Bengali is that the appearance of numeral classifiers in that language correlates with the loss of both gender and obligatory plural marking (cf. Section 4.3).

In the case of classifiers involving kinship or social status, change of a classifier can be used to convey affection or contempt, and can be exploited in verbal play. In Jacaltec (Mayan) it is an insult to use the noun classifiers *naj* 'male non-kin', *ix* 'female non-kin' with reference to an old or famous person, instead of the expected *ya7* 'respected human'. Conversely, use of *ya7* with reference to someone normally classified as *naj* or *ix* is considered as a compliment (Craig, 1986b, p. 270).

In Central Thai (Tai), the classifier for ordinary human beings (*khon*), can be replaced by the animal classifier (*tua*) when referring to 'bad people such as murderers' (Burusphat, 2007, p. 114). On the other hand, '[m]any families in Bangkok consider dogs as a member of the family, so the dogs are put into the *khon* class' (p. 122). Similar examples are given by Juntanamalaga (1988, pp. 318–319), which contradicts the claim by Hundius and Kölver (1983, pp. 186–189) that Thai classifiers have only a quantifying, and never a qualifying function. This claim is explicitly disputed by Juntanamalaga (1988, p. 318), who says that '... in many cases the speaker has some choice of selecting alternates in accordance with desired semantic or stylistic nuances.' The use of animal classifiers for derogatory reference to humans has also been reported for Vietnamese and Muong (Mon-Khmer) (Adams, 1992, p. 121), and Burmese (Tibeto-Burman) (Becker, 1975, p. 115). With regard to the latter, Becker (1975, p. 115) notes that '[p]eople have no *fixed* position in [the classifier] network. If one considered a king to be depraved, he might classify him in private as an animal, though it might be wise and safe to classify him in public as a saint.'

Other types of classifiers can also be used to convey affective meanings. For example, Sapir (1932) relates a pun in Navajo (Athabaskan) which rests on the use of classificatory verb stems 'pick up' and 'put down', normally used for round objects, with reference to a crippled person. Rushforth (1991, p. 263) provides an equivalent example from Bearlake (Athabaskan).

As we have shown, markers of nominal classification can be used for a range of semantic functions, including expressions of a speaker's subjective attitude toward the referent. We now turn to discourse functions.

5. Discourse functions

All types of nominal classification systems contribute to the organization of discourse: the presence or choice of class marking or classifier can be used to establish and manipulate the status of a referent. This is usually described as 'reference tracking'. The extent to which certain discourse functions are exploited depends on the obligatoriness of classification as well as syntactic and pragmatic factors. While it has been suggested that such functions are more typical in systems in which marking is optional (Aikhenvald, 2000, pp. 321–329) we also provide examples from grammaticalized noun class/gender languages.

We will discuss three types of functions. First, nominal classification markers can be used anaphorically or deictically to help identify a referent; in this capacity they can also help disambiguate between potential referents. Second, the availability of classification markers for anaphoric reference allows them to contribute to reference management, where the presence of noun class marking/agreement and the presence or choice of a classifier, or the position of a classifier phrase, correlates with such properties as definiteness, persistence, and prominence in discourse. Finally, classification markers can be used to introduce a new perspective on the referent.

The employment of classification markers for reference has other discourse effects as well. For example, in many languages where noun classification is indexed by obligatory pronominal prefixes on the verb, it is possible to avoid mentioning nouns explicitly unless some referential ambiguity would arise. As a result, the ratio of verbs to nouns may be relatively high (see Section 5.1). Also, the use of classification markers on modifiers such as adjectives, demonstratives and the like makes it possible for word order to be relatively flexible (see Sections 6.1 and 7).

5.1. Referent identification: Anaphora, deixis, and disambiguation

All types of nominal classification markers can be used to identify, establish, and maintain referents in discourse. In this section we focus on the identification function; we discuss the other related functions in Section 5.2. Noun class systems, as opposed to classifier systems, co-occur with grammatical agreement, i.e., a set of markers appearing on demonstratives,

verbs, and other elements that index the class or gender of the noun to which these elements refer. For the purpose of identifying a referent (or a noun that identifies the same referent), noun class need not be marked overtly on both nouns and modifiers. If the assignment of nouns to classes is relatively stable and conventionalized, the classification can be marked only on 'targets' and not on the nouns themselves (an example is German). This strongly suggests a functional relationship between these phenomena. Indeed it has often been suggested that subdivision of nouns into classes that are indexed by agreement makes it easier to identify the reference of modifiers by restricting the candidates to a noun of such-and-such a class (see Fodor, 1959; Greenberg, 1978; H. Seiler, 1986; Zubin and Köpcke, 1986; Corbett, 1991). For referent or noun identification purposes it is also not necessary for noun classes to be semantically transparent, a point reinforced by Acuña-Fariña (2009) in a review of psycholinguistic studies of agreement (see Section 6.1). In practice, however, noun classes always have some semantic coherence, even if assignment is also based on morphological or phonological properties (Corbett, 1991, Chapter 3). This is also functionally motivated: a system that makes some sense is presumably easier to learn than an arbitrary one. Dobrin (2013, pp. 180–182) points out the corresponding learnability of agreement systems based on alliteration with the noun's phonological form.

Even though concordial agreement is typically not found with classifiers, they may also be used to refer anaphorically to entities previously referred to by a noun. Both types of classification make it possible to avoid repeating the noun, with the reference maintained by the classification markers. As with concordial agreement markers, for the purpose of referent/noun identification it does not matter whether the relationship between classifier and noun is semantically motivated or arbitrary, as long as it is consistent.

In this section we include both examples of classification markers used for deixis (identification related to the context of or participants in the speech situation) and anaphora (coreferentiality with another referring expression in the discourse, e.g., a noun). These definitions are based on Lyons (1977, Chapter 15). Note that Lyons' definition of 'anaphora' differs from some other, less careful ones, in that an anaphoric expression is said to refer, not directly to an antecedent linguistic expression, but 'to what its antecedent refers to' (p. 660). This definition makes anaphora not very different from deixis, for it allows the possibility that, e.g., a pronoun can refer independently of an overt linguistic antecedent. In fact, Lyons regards deixis as a 'more basic' pronominal function than anaphora (p. 667ff.).

We begin with relatively straightforward examples of classification markers used anaphorically, then move on to the related functions of deixis and disambiguation. Some examples include more than one of these functions.

Anaphoric use of gender markers can be illustrated with the following example from Nunggubuyu, an Australian language characterized by rudimentary case marking, free word order and highly elliptical discourse (Heath, 1983). In Nunggubuyu noun class 'appears to constitute the glue which holds the system together' (p. 139). There are seven noun classes, which are marked obligatorily on the verb. Noun class affixes index participants in discourse in the absence of relational syntax. This is illustrated in example (10). In (a) the prefix on the verb carries noun class and case information, in the combination 'he/her', and so makes it possible to track referents and their case roles. Once the participants have been introduced, the sentence could be reduced to the inflected verb, as in (b), with the meaning 'he hit her':

(10) Anaphoric use of gender markers in Nunggubuyu (Australian) (Heath, 1983, p. 140)

a. *na-wa̲lyi-n^{y}un^{g}* *n^{g}u=wi-ni* *n^{g}ara-ma̲n̲i-n^{y}un^{g},* *na-r̲un^{g}gal-yun^{g}*
MASC-man-HUM.SG 3MASC.SG/3FEM.SG=hit-PAST.CONT FEM-woman-HUM.SG MASC-big-HUM.SG
'The big man hit the woman.' (literally 'man he-her-hit woman, big')

b. *n^{g}u=wi-ni*
'he hit her'

With regard to this example, Heath points out that 'big' is unambiguously linked with 'man' by its noun class marking, even though it is separated from its antecedent by the intervening verb and object; indeed he describes the adjective as an afterthought. Heath notes that 'the elaborate N[oun] C[lass] system makes possible both the striking casualness of case marking (by affixes or order) and the flexible order of constituents even within (what we consider to be) NPs and the like' (p. 141).

Noun class markers carry out the role of referent identification in Yimas (Lower Sepik) (Foley and Van Valin, 1984; Foley, 1986, p. 88). The noun class system in Yimas is complex, with around twelve classes (with some neutralization in verbal prefixes), the choice of which is based on semantic and phonological principles. Referents that are known or given are normally represented by affixes on the verbs. Noun class markers are used as anaphoric pronouns not only with an implied referent, which has been previously introduced in discourse, but also with 'culturally' established referents, e.g., in traditional stories. These need not be introduced with a full NP at all, and may be referred to throughout the discourse only by way of noun class affixes.

A similar use of classification markers to allude to a semantic domain that is associated with a particular noun class, without mentioning a noun, is found in Mawng (Iwaidjan) (Singer, 2010, pp. 401–403). In Mawng the Land gender is normally used with words related to language, stories, and knowledge. It is therefore possible to use Land gender markers alone to refer to these concepts without mentioning a noun (see Contini-Morava, 1996 for similar examples from Swahili).

A result of the use of verbal affixes for referent identification is that the verb to noun ratio in discourse may be relatively high. For example, Foley and Van Valin (1984, p. 327) estimate the ratio of verbs to nouns in Yimas discourse as eight verbs to

a noun. Singer (2010, pp. 407–408) states that the omission of nouns, leaving gender marking to carry 'the burden of reference', is a characteristic of a number of Australian languages. An analogous effect is found in classifier systems: Aikhenvald (2000, p. 333) reports that classifiers are more frequent in discourse than nouns in various South American languages.

The above examples illustrate the anaphoric use of noun class marking to identify previously mentioned or contextually identifiable referents. We now turn to examples of the use of classifiers for this purpose.

Anaphoric use of noun classifiers is illustrated in example (11)(b), from Jacaltec (Mayan). Craig (1992, p. 292) points to the ubiquitous use of noun classifiers as devices for identifying referents; she describes Jacaltec classifiers as 'the only anaphoric pronouns of the language'.

(11) Anaphoric use of noun classifiers in Jacaltec (Mayan) (Craig, 1986b, p. 264)

a. *xil* *naj* *xuwan* *no7* *lab'a*
saw NCLF:MALE John NCLF:ANIMAL snake
'John saw the snake.'

b. *xil* *naj* *no7*
saw NCLF:MALE NCLF:ANIMAL
'He saw it.'

Numeral classifiers can also be used for anaphoric reference, as illustrated by example (12)(b) from Tzotzil (Mayan). In this example, uttered by a customer buying candles in a store, the numeral classifier *ch'ix* 'longish' is used with reference to an object previously mentioned:

(12) Anaphoric use of numeral classifiers in Tzotzil (Mayan) (León Pasquel, 1988, p. 68)

a. *jay-ch'ix* *kandela*
INTER.QUANT-NUM.CLF:LONGISH candle
'How many candles?'

b. *ta* *j-k'an* *cha`-ch'ix*
INCOMPL 1PERS.ERG-want two-NUM.CLF:LONGISH
'I want two.'

Related to this use is the deictic use of classification markers to indicate a referent that is obvious from the context. For example, the customer and merchant could use the numeral classifier for longish things to refer to candles hanging in the store, even though the word 'candle' has not been explicitly mentioned (León Pasquel, 1988, p. 46).

Classifiers indicating spatial relations, types of motion events, and physical properties of objects such as shape and size are a universal feature of signed languages (Sandler and Lillo-Martin, 2006, p. 76). Classifiers in sign languages are special handshapes that subcategorize nouns or referents (e.g., 'vehicle', 'animal', 'one-dimensional object'), and are used with verbs of motion or location (Suppalla, 1986, p. 183). Sign language classifiers strongly resemble the phenomenon of noun incorporation (Sandler and Lillo-Martin, 2006, Section 5.2.1).[24] In a manner similar to classification markers in spoken languages, they are used for anaphoric reference and to maintain topic continuity. Aside from anaphora, sign language classifiers may become lexicalized and they may be used creatively in poetry and storytelling (Sandler and Lillo-Martin, 2006, pp. 86–87, 92–93).

The above examples illustrate the anaphoric use of classification markers to identify previously mentioned referents. Another, related way that classification markers can be used anaphorically is to help disambiguate between antecedents. As pointed out above, subdivision of nouns into classes narrows the potential range of reference of classification markers that index the noun. For example, (13) illustrates disambiguation by way of gender marking on a pronoun in German or on a verb in Polish. In English both NPs would have to be repeated.

(13) Use of gender to disambiguate between antecedents in German (Zubin and Köpcke, 1986, p. 174) and Polish (MK's data)

a. *Der Krug* (masc.) *fiel in die Schale* (fem.), *aber er* (masc.) *zerbrach nicht.*
Dzbanek (masc.) *wpadł do miski* (fem.), *ale się nie zbił* (masc.).
'The jug fell in the bowl, but it (the jug) didn't break.'

b. *Der Krug* (masc.) *fiel in die Schale* (fem.), *aber sie* (fem.) *zerbrach nicht.*
Dzbanek (masc.) *wpadł do miski* (fem.), *ale się nie zbiła* (fem.).
'The jug fell in the bowl, but it (the bowl) didn't break.'

[24] The grammatical status of classifiers in signed languages is controversial. Sign language classifiers differ from ordinary signs in a number of ways, such as the use of the non-dominant hand to signal information different from the dominant hand (see Sandler and Lillo-Martin, 2006, pp. 77–82). Some have argued that they are partly non-linguistic gestures (e.g., Liddell, 2003, p. 269; see also references in Morgan and Woll, 2007, pp. 1162–1163). However, it is widely agreed that these elements resemble spoken language classifiers in many respects, especially in their discourse functions.

The following example from Swahili illustrates the use of noun class concords to help group modifiers with the appropriate nouns:

(14) Use of noun class concords to group modifiers with referents in Swahili (Bantu) [example from newspaper, ECM's data]

u-jenzi	*w-a*	*ki-wanda*	*ch-a*	*∅-taifa*	
NCP11-construct	CP11-of	NCP7-factory	CP7-of	NCP5-nation	
ch-a	*ma-dawa*	*y-a*	*mi-mea*	*ch-a*	*Moshi*
CP7-of	NCP6-medicine	CP6-of	NCP3-plant	CP7-of	[place]

'the construction of the national factory of medicinal plants of/in Moshi' [lit., construction of factory of nation of medicines of plants of Moshi]

The concordial prefixes on the connective particle indicate which prepositional phrase modifies which noun, so the Cl. 7 concordial prefix on 'of' before the place name Moshi indicates that the phrase 'of Moshi' modifies a Cl. 7 noun, in this case *kiwanda* 'factory', and that reference is not being made to plants of Moshi or medicines of Moshi or the nation of Moshi (all nouns of classes other than 7 that are mentioned in the preceding context). While Claudi (1985, pp. 42–44) has suggested that [NP-internal] agreement in Swahili does not contribute to avoidance of ambiguity, the construction illustrated in (14) is common. Although some of the potential antecedents in (14) are less plausible than others for pragmatic reasons, the concordial prefixes are far from redundant.

The examples we have presented show that anaphoric use of noun class markers helps avoid ambiguity in a range of syntactic contexts. Classifiers can perform similar functions. For example, Mithun (1999, p. 108) argues that choice of a classificatory verb not only provides information about a given activity, but also establishes 'expectations about the nature of the object involved'. As a result, it can be used to disambiguate between antecedents. In example (15) from Bearlake (Athabaskan), three referents are introduced in (a) ('person', 'dog', and 'gun'). In spite of the missing arguments in the following sentences, their meaning is clear thanks to the classificatory verb used, referring to the gun as 'sticklike' or the person as 'animate'.[25]

(15) Disambiguation by classificatory verbs in Bearlake (Athabaskan) (Rushforth, 1991, p. 255)

a. *Dene* *'ı̨dídzené* *kwik'u* *t'á* *tłı̨* *whehk'é*
person yesterday gun with dog s/he.shot.it
'A person shot a dog with a gun yesterday.'

b. *Tułíta* *gots'ę́* *détǫ*
Fort.Norman to it.was.taken (sticklike)
'[The gun] was taken to Fort Norman.'

c. *Tułíta* *gots'ę́* *déhtı̨*
Fort.Norman to it.was.taken (animate)
'[That person] was taken to Fort Norman.'

As we have shown, both class-based agreement and classifiers can be used to identify referents in discourse. Classification markers can be used anaphorically, deictically, and even on their own as a substitute for explicit mention of nouns. These functions involve indexing the morphosyntactic properties of nouns and/or semantic properties of referents or classes of referents.

It is sometimes suggested that the differentiation provided by classification markers, such as pronouns, that index a small number of noun classes (e.g., the two or three typically found in gender languages) is a less effective tool for reference tracking than that provided by a larger number of classes (e.g., Heath, 1975, p. 93; Trudgill, 2011, p. 158). However, this claim is usually just asserted as if it were self-evident, without supporting argumentation. In fact, studies of topicality in discourse have shown that the referents most likely to be mentioned more than once (and therefore the ones most likely to be referred to with a pronoun rather than a full noun phrase) are animate, especially human (see, e.g., Givón, 1983, p. 22). Yet the differentiation provided by large noun class systems is overwhelmingly concentrated on subcategorization of inanimates. The presence of several inanimate classes specifically for this function could be seen as 'overkill' (Dahl, 2004, p. 201). The relative 'functional load' of small vs. large noun class systems with regard to reference tracking is an interesting, and as far as we know, still open question. However, the functions to be illustrated in the following sections can be performed just as well with a small number of classification markers as with a large one.

[25] According to Rushforth (1991, p. 256), *dene* 'person', i.e., the first animate NP in (a), rather than *tłı̨* 'dog', is understood to be the missing argument of the verb *déhtı̨* in (c).

5.2. Reference management

Related to the discourse functions discussed in the last section is that of expressing a range of messages having to do with definiteness/specificity, topicality, thematic salience and referentiality. We now turn to this function, which we will call 'reference management'. Our use of this term resembles, e.g., Merlan et al. (1997), who use it in a general way to include reference instantiation as well as reference maintenance.

A relationship between nominal classification and definitizing of the referent has been suggested by Lucy (2000, p. 337), following Silverstein (1986): 'A noun phrase typically indicates for a given referent its intrinsic type, its extrinsic individuation status, and its discourse presupposability.' These semantic components may be expressed by different formal elements, but more than one may also be 'laminated' onto a single form, such as a deictic marker, as suggested by Greenberg (1978). This shows the close connection between individuation and 'non-generic reference' (Senft, 2000b, p. 26), i.e., definiteness or specificity. According to Claudi (1985, pp. 68–72), there is by definition a close connection between gender and establishing reference, regardless of the semanticity of gender.

Aspects of reference management that depend on presence or absence of a classification marker are most typically found where class marking is not obligatory, i.e., in classifier systems. However, grammaticalized noun class languages also provide us with examples. The presence and choice of certain types of class marking may depend on whether an NP is definite, specific or topical. A correlation with definiteness/specificity is illustrated by noun class languages with double overt marking (by prefixes and suffixes). In Gurma (Voltaic) prefixes function as markers of definiteness, e.g., *niti-ba* 'men' vs. *ba niti-ba* 'the men' (Greenberg, 1978, p. 55). In Turkana (Eastern Nilotic), the presence of overt marking on nouns depends on whether the referent is specific or generic: 'The gender prefix of nouns is frequently omitted with names of animals in folk tales when the names are used in their generic sense.' (Dimmendaal, 1983, p. 221).

Choice of noun class marking can also be sensitive to discourse status. This is illustrated by the emergent noun class system in Miraña (Bora-Witotoan), which includes six general class markers and over fifty specific markers (Seifart, 2004, 2005) (their derivational use was discussed in Section 4.1). According to Seifart (2004, pp. 239–240), Seifart (2005, pp. 258–262), the choice between general and specific class markers allows several degrees of specification which can be used to indicate the discourse status of a referent, for nouns which occur with specific markers, i.e., inanimates and most animals. Example (16) comes from a story about making a blowgun. It illustrates three degrees of specification, i.e., maximal specification at first mention in (a) (noun and specific class marker, together with a pronominal expression), minimal specification in the sentences elaborating on the manufacture of the blowgun in (b–e) (pronominal reference and general class marker), and partial specification in the concluding sentence in (f) (pronoun and specific class marker), which both marks a discourse boundary, as suggested by Seifart (2005, p. 260), and takes a new perspective on the referent (how the speaker disposed of it, as opposed to its manufacture).

(16) Use of noun class marking for reference management in Miraña (Bora-Witotoan) (Seifart, 2005, p. 259)

a. *i:hú=pɛ́* ***tɛ:-nɛ*** ***tódʒi:-hɯ*** *o*
yesterday=REMOTE.PAST 3.**PRO-GCM.INAN** **blowgun-SCM.TUBE** 1SG.SUBORD
pákigwájhhɯ-kí *ájmú-múná:* *gwaʔrá-bá*
rasp-PURP white-people rasp-SCM.THREE-DIMENSIONAL
'Yesterday I sandpapered **the blowgun**, (with) the white man's rasp,'
[...]

b. *i-htú:-ɾí* *o* *míbɛ́hhɯ-ki* ***tɛ:-nɛ***
POSS.3-blood-INSTR 1SG.SUBORD wrap-PURP **3.PRO-GCM.INAN**
kóʔpɛ-né *i* *káβá:βɛ-ki*
hard-GCM.INAN 3SG.SUBORD become-PURP
'So I would with its sap (i.e., the rubber tree's), wrap **it**, so it would become hard'

c. ***a:-nɛ*** *ó* *míbɛ́kɯ-ʔíhka-ʔí* *ó* *míbɛhkú-ʔí*
CON-GCM.INAN 1SG wrap.up-HAB-PRED 1SG wrap.up-PRED
'And I wrapped **it** up over and over, I wrapped it up,'

d. ***ímí-nɛ*** ***tɛ:-nɛ*** *í* *káβá:βɛ-ki*
good-GCM.INAN **3.PRO-GCM.INAN** 3SG.SUBORD become-PURP
'so **it** would become good'

e. ***a:-nɛ*** *ó* *nuhtsókɯ-ʔi* *úβɛ́ʔkóʔ*
CON-GCM.INAN 1SG try.out-PRED good
'and I tried **it** out: good!'
[...]

f. *tɛ́tsi:tɯ́ = ʔdɯ* *á:báhá-hpi:-kɛ́* *ó*
then=TAM owner-GCM.MASC.SG-ACC 1SG
áhkú-ko-:ʔi ***tɛ́:-hɯ-βɯ*** *ajúhɯ*
give-PERF-FUT.PRED **3.PRO-SCM.TUBE-ALL** all.right
'and after that, indeed, I will give **it** to its owner all right.'

The progression from most elaborately coded NP in (a) to less explicit coding in (b–e) is consistent with Givón's (1983, pp. 17–18) scale of coding of topic accessibility: the first mention of the blowgun is both a relatively inaccessible/new topic and one that will be persistent in the discourse, whereas the subsequent mentions are low in referential distance ('look-back') from the initial mention, hence highly accessible.

As mentioned above, the use of presence vs. absence of classification markers to indicate definiteness, referentiality and topicality is more typical of the less grammaticalized classifiers, in particular noun, numeral and deictic classifiers (see Aikhenvald, 2000, pp. 322–329). The degree of overt grammatical coding of a linguistic expression that identifies a discourse referent is related by Hopper and Thompson (1984, pp. 710–711) to the kinds of entities that are most likely to play a significant role as participants in discourse:

> From the discourse viewpoint, nouns function to introduce participants and 'props' and to deploy them. To the extent that a linguistic form is carrying out this prototypical function, it will be coded as a N, and will manifest the full possible range of nominal trappings conventional in the language. Forms which fail in some way to refer to concrete, deployable entities will typically lack some or all of these trappings.

Hopper (1986) applies this argument to use vs. non-use of numeral classifiers in written Malay (Malayo-Polynesian): he states that contexts most conducive to use of a classifier are references to entities that are specific, concrete, countable, enumerated, not intrinsically quantified, persistent, presentative, and involved in past/realis events (pp. 313–314), i.e., entities that are 'potential topics' (p. 324).

Numeral classifiers in Mandarin exhibit related discourse patterns, which involve the use of classifiers in presentative structures as well as the use of a specific classifier for first mention of a referent, which is then substituted with a general classifier (see Erbaugh, 1986, p. 408). The use of numeral classifiers in presentative structures in Mandarin is documented in a study of classifiers in spoken and written narratives by Li (2000). As evidence that such referents are salient, Li reports a strong correlation between use of a classifier and presence of other modifiers such as adjectives or relative clauses, in contrast with NPs that are not classified. Li also finds a strong tendency for classifiers to occur in foregrounded (i.e., affirmative independent, as opposed to negative, interrogative, or subordinated) clauses. She provides the following example to illustrate the use of classifiers for salient referents:

(17) Use of numeral classifiers for salience in Mandarin (Chinese) (Li, 2000, pp. 1121–1122) [English translation slightly modified to highlight the relevant structures; spelling as in Li]

Chuanshuo	*zai*	*hen*	*gu*	*de*	*shihou,*	*you*	***yi-ge***	***jiao***	***Youdu***
legend.say	be	very	old	MOD	time,	there.be	one-CLF	called	Youdu
de	***difang***	*zhongnian*	*bu*	*jian*	*taiyang,*	*daochu*	*yipian*	*qihei.*	
MOD	place	all.year	not	see	sun,	everywhere	all	pitch.dark	
Zai	*nar*	*you*	***yi-zuo***	***da***	***hei***	***shan,***	*shan*	*shang*	*zhu*
in	there	there.be	one-CLF	big	dark	mountain	mountain	top	live
zhe	*xuduo*	*kepa*	*de*	*guaishou*	*Neixie*	*guaishou*	*jingchang*	*xia*	
PRT	many	scary	MOD	monster.	those	monsters	often	descend	
shan	*weihai*	*renmen.*	*You*	***yi-ge***	***juren***	***jiao***	***Kuafu,***	*ta*	
mountain	endanger	people	there.be	one-CLF	giant	named	Kuafu,	he	
yong	*guaizhang*	*he*	*guaishou*	*bodou*	*le*	*jiu*	*tian*	*jiu*	*yie*
use	cane	with	monster	fight	PRT	9	day	9	night
zhongyu	*ba*	*ta*	*da*	*si*	*le*				
finally	TAKE	them	beat	dead	PRT				

'Once upon a time, **there was a (Classifier) place called Youdu**, [where] people lived in darkness all year round. **There was a (Classifier) big black mountain** where many terrible beasts lived. The beasts often went out to harm people. **There was a (Classifier) giant called Kuafu**. He fought with the beasts with a stick for nine days and nine nights. Finally, he killed them all . . .'

In this passage three referents are introduced by presentative structures: 'a place called Youdu', 'a big dark mountain', and 'a giant named Kuafu'. Aside from the fact that each of the nouns in these phrases is accompanied by modifiers (other than the numeral and classifier), they are also each referred to at least twice more in subsequent discourse. At the same time, Li (2000, p. 1118) argues that in Mandarin referents need not be persistent in order to be salient: she states that classifiers 'could also be used to highlight NPs for the purpose of vivifying or intensifying the description without implication of significance in the thematic development of the narrative'.

Although use of numeral classifiers often correlates with introduction of new discourse participants, as in Malay and Mandarin, this correlation is likely due not to presence vs. absence of the classifier alone, but to the fact that numeral classifiers occur in a particular syntactic construction that specifies the associated noun for number. As pointed out by Hopper (1986, p. 317), counted entities 'are typically concrete, real, newly mentioned, and rhematic'. Downing (1996, Chapter 7) argues that in Japanese, classifier phrases tend to be used when introducing a new topic, whereas optional plural marking is used for subsequent reference to salient discourse participants.

In some languages, presence of a noun classifier correlates with persistent referents. For example, in Akatek (Mayan) (Zavala, 2000, pp. 137–140) noun classifiers only appear with individuated, referential nouns with third-person referents, thus excluding vocative constructions, incorporated nouns and generic/indefinite uses. In addition, their presence is sensitive to discourse status, as illustrated by the behavior of proper nouns: even though proper nouns are by definition referential and individuated, they are not obligatorily accompanied by a classifier. Instead, as shown in the narrative in example (18) below, the presence of classifiers depends on the thematic importance of the referent and type of context. Thus in (b) and (d) the proper name *Maltin* appears with the male classifier *naj* in a foregrounded context with direct speech. In contrast, further references to the participant are made without a classifier in (f) and (h) in a backgrounded context with the evidential verb 'say' (the absence of a classifier is marked with '///'). Additionally, the given/familiar status of the participant is reflected in subsequent references in (i-r) with the classifier *naj* used anaphorically. According to Zavala, such anaphoric use is only found with respect to nouns previously introduced with a noun classifier.

(18) Use of noun classifiers for reference management and anaphora in Akatek (Mayan) (Zavala, 2000, pp. 138–140) (PRO in (i-r) glosses of *naj* replaced by NCLF for clarity).

a. [. . . when it cleared up]

b.

maxtoo	*'ix*	*'ixnam*	*xutx*	***naj***	*Maltin*	*q'ano*	*jek*	*q'ap*	*tu'*
went	NCLF	old.lady	his.mother	NCLF	Martin	ask	credit	cloth	DIST

'Martin's mother went to ask for clothes on credit.'

c. [She arrived before the king]
– Father, are you here?
– Well here I am, madam.
– Why have you come?

d.

tol	*maxinxhejtej*	***naj***	*wune'*	*Maltin*	*each*	*ti'*	*mamin*
that	he.sent.me	NCLF	my.son	Martin	to.you	PROX	father

'My son Martin sent me here, father.'

e. [. . . all together they will give me the money]

f.

xhi	///	*Maltin*	*tu'*	*tet*	*xutx*	*tu'*
said		Martin	DIST	to	his.mother	DIST

'said Martin to his mother'

g. [I really hope you're right my son]

h.

xhi	*xutx*	///	*Maltin*	*tu'*
said	his.mother		Martin	DIST

'said Martin's mother'

i.

tolab'	*ojawa'*	*yijatz*	***naj***
that	you.will.give	his.load	NCLF

'He wants you to give him some merchandise.' [said the old lady]

j. [What kind of merchandise? Said the king]

k.

tol	*chawa'*	*nioj*	*q'ap*	*sek*	***naj***
that	you.give	little	cloth	his.credit	NCLF

'He wants you to give him some clothes on credit.'

l.

tol	*chiyoche*	***naj***	*chitxonwi*
that	he.wants	NCLF	sell

'that he wants to sell'

m. [Oh, said the king]

n.

tatol	*chiyoche*	***naj***	*chitxonwi*	*xin*
if.that	he.wants	NCLF	sell	then

'if he wants some to sell'

o.

chiwa'	*tet*	***naj***
I.give	to	NCLF

'I will give them to him.'

p. *chawal* *tet* ***naj***
you.say to NCLF
'You say to him'

q. *chiya'pax* *stool* ***naj***
he.give.back his.payment NCLF
'He will pay back.'

r. *man* *tuk'al* *chisq'aneltoj* ***naj***
NEG just he.ask.for NCLF
'That he doesn't just ask . . .'

The discourse status of a referent can also be manipulated by noun incorporation. According to Mithun's (1984) typology of noun incorporation, the use of incorporation to background old or incidental information is characteristic of Type III (classificatory verbs constitute examples of Type IV of noun incorporation). For example, whether a generic noun in Bininj Gun-wok (Australian) is incorporated into the verb or not depends on discourse factors: 'new, stressed, contrasted or conjoined nominals are external, while given or unstressed nominals are incorporated' (Evans, 1996, p. 73). Example (19) shows how generic nouns progress from external to incorporated status, depending on their role in discourse. The noun *-gurlah* 'pelt' is introduced and occurs once again with its classification marker as a free NP, perhaps to distinguish the first reference to pelts as the goal of putting down bait from the reference to the actually acquired pelts. But once this latter reference has been established, the noun referring to the now given pelts is incorporated into the verb without a classification marker. A new noun then introduced in the same argument frame, i.e., *warde-* 'rock, money', is not incorporated:

(19) Use of noun incorporation for reference management in Bininj Gun-wok (Australian) (Evans, 2003, p. 475)

Ngaye	*gorrogo*	*an-bang*	*nga-gurrm-i,*	*gun-gurlah*
I	before	CL.III-dangerous	1/3-put.down-PAST.IMPERF	CL.IV-pelt
a-ma-ngi.	*Gun-gurlah*	*a-ga-ni*	*djamun-djahdjam.*	
1/3-get-PAST.IMPERF	CL.IV-pelt	1/3-take-PAST.IMPERF	dangerous-place	
A-gurlah-wo-ni,	*gun-warde*	*an-wo-ni.*		
1/3-pelt-give-PAST.IMPERF	CL.IV-money	3/1-give-PAST.IMPERF		

'In the old days I used to put down (dingo) baits to get their pelts. I would take the hides to the police station. I would give them to him and he would give me money.'

According to Evans, such incorporation is typical of inanimate referents in object function: '. . . the commonest functions of incorporated generic nominals are for tracking established inanimate participants, as well as 'procedurally implicated' entities that have a short-lived discourse appearance in the context of certain activities (e.g. house-building, wood-gathering).' (Evans, 2003, p. 475).

In our discussion of reference management so far, we have focused on the discourse effects of presence or absence of a classification marker. However, in languages where nominal classification is expressed syntactically (as opposed to morphologically), the position of the classifier phrase can also affect its interpretation. For example, Downing (1996, p. 33) provides the following examples from Japanese in which different interpretations result from placement of the classifier phrase before the noun and preceding the attributive marker *no* (in (a)), after the noun with the accusative particle *o* following it (in (b)) vs. following the noun (in (c)) (see also Downing, 1996, Chapters 7 and 8):

(20) Differences in interpretation based on position of classifier phrase in Japanese (Downing, 1996, p. 33)

a. *Mai-nichi,* *mai-nichi,* ***hito-tsu****-no* *burausu-o* *kite* *sooji-o* *shite-ita*
every.day every.day **one-INAN**-ATT blouse-ACC wearing cleaning-ACC did
'Day after day, (she) did the cleaning wearing **the same blouse**.'

b. *Mai-nichi,* *mai-nichi,* *burausu* ***hito-tsu****-o* *kite* *sooji-o* *shite-ita*
every.day every.day blouse **one-INAN**-ACC wearing cleaning-ACC did
'Day after day, (she) did the cleaning wearing **only a** blouse.'

c. *Mai-nichi,* *mai-nichi,* *burausu-o* ***hito-tsu*** *kite* *sooji-o* *shite-ita*
every.day every.day blouse-ACC **one-INAN** wearing cleaning-ACC did
'Day after day, (she) did the cleaning wearing **one** blouse.'

Similarly, Cheng and Sybesma (1999) provide examples of the effects on definiteness of pre- vs. post-verbal placement of classifier phrases in Mandarin and Cantonese.

In summary, in the last two sections we have illustrated the use of nominal classification markers to identify, establish and maintain reference. As shown in this section, presence or absence of a classification marker, or position of a classifier phrase, may result from the definiteness, specificity, topicality or referentiality of the referent.

5.3. Re-presentation of referents

We now turn to examples where a noun is first associated with one classification marker, and then is recategorized. In these cases change of classification marking may be used to indicate a change in perspective on the referent. In languages with noun classes, this usually involves first identifying the referent by indexing morphosyntactic features of the noun that refers to it, then presenting new information about it by means of different classification markers. In classifier languages the process is similar (use of one classifier followed by use of a different one), but this is not usually described in terms of 'concordial agreement'. We begin with examples from languages with noun classes/gender, then provide some examples with classifiers.

With regard to syntactic context, examples of re-presentation in noun class/gender languages conform with Corbett's Agreement Hierarchy (see Corbett, 1979, p. 204; Corbett, 2006, p. 207):

attributive > predicate > relative pronoun > personal pronoun

Corbett (2006, p. 207) interprets the hierarchy as follows:

> For any controller that permits alternative agreements, as we move rightwards along the Agreement Hierarchy, the likelihood of agreement with greater semantic justification will increase monotonically (that is, with no intervening decrease).

As pointed out by Barlow (1991, p. 34), Corbett's notion of 'syntactic' vs. 'semantic' agreement is based primarily on matching vs. non-matching of formal features between the noun and agreement targets, 'rather than on a determination of whether agreement dependencies are syntactically or semantically motivated'. Barlow (1991, p. 37) proposes a pragmatic explanation for the fact that targets to the left of Corbett's hierarchy are more likely to match the morphosyntactic features of the noun, whereas those toward the right are more likely to add new information:

> The role of agreement morphemes can be viewed in two ways: as an identification (or reidentification) of the intended referent or as an elaboration of the characteristics of the intended referent. It is plausible to assume that in the initial stages of introduction of a referent in the discourse it is necessary to provide a clear identification of the discourse referent. If this is the case, it will lead to the specification of the same properties by the agreement morphemes as are indicated by the noun. Once established, however, there is the possibility of either adding new features to indicate new information about the discourse referent or identifying the primary discourse referent by use of fewer properties than were used initially.
>
> Furthermore, as the discourse continues it is reasonable to expect that there will be some decay in the salience of the noun used to instigate the primary discourse referent and a concomitant increase in the salience of actual referents and other contextual information in the discourse situation. For example, there is an increasing tendency to indicate natural gender rather than grammatical gender.

The following examples are consistent with Barlow's view of the relationship between the Agreement Hierarchy and identification/elaboration of referents in discourse.

One well-known example of this phenomenon involves German nouns of neuter gender that refer to human beings, such as *das Mädchen* 'the (neut.) girl', *das Modell* 'the (neut.) model'. The following passage comes from an interview with Alicia Silverstone in a teen girl's magazine (glossing conventions slightly modified):

(21) Recategorization of referent in German (Zubin and Köpcke, 2009, p. 241)

Interviewer: In Ihrem neuen Kassenhit 'Clueless' spielen Sie ***ein ziemlich schrilles 'material girl'.*** *Wie steht's da mit der Identifikation?*
Silverstone: ***Das*** *ist* ***ein sehr oberflächliches Mädchen, das*** *nur an Klamotten und Geld denkt – als Rollenvorbild für Kids natürlich denkbar ungeeignet. Andererseits ist* ***sie*** *sehr modern, sehr zeitgemäß – es war schon lustig,* ***sie*** *zu spielen. Interview mit Alicia Silverstone, 18 Jahre. Allegra 11/95, 189.*

Interviewer: In your new box-office hit 'Clueless' you play **a rather shrill 'material girl'** (neut.). Is there any identification going on there?
Silverstone: **That** (neut.) is **a very superficial girl** (neut.), **who** (neut.) thinks only about clothing and money – not particularly appropriate as a role model for kids. But otherwise **she's** (fem.) very modern, very contemporary – it was really fun to play **her** (fem.).

In the German translation the interviewer consistently uses neuter gender on modifiers and pronouns that refer to the *material girl*. Silverstone begins by doing the same thing with reference to the neuter noun *Mädchen* 'girl', but then switches to feminine pronouns. This can be seen as a switch in Silverstone's perspective on the character she portrays, first negative

(a bad role model), then (after the contrastive adverb *andererseits* 'otherwise') more positive (someone modern and fun to portray).[26]

A similar example, from a Swahili detective novel, involves the noun *maiti* 'corpse':

(22) Recategorization of referent in Swahili (Bantu) (Abdulla, 1968, pp. 70–71)

Kwa		*amri*		*ya*		*Spekta Seif*					
by		order		of		Inspector Seif					
maiti	***i-****li-geuzwa*			***i-****ka-sogezwa*							
body.CL9	CL.9.SUBJ.PFX-PAST-be.turned			CL.9.SUBJ.PFX-CONSEC-be.moved							
na	*kulazwa*	*chali*	*kando*	*ya*	*lile*	*jiwe*	*la*	*duara.*	*Hapo*	*tena*	
and	be.placed	supine	side	of	that	stone	of	round	then	indeed	
a-*ka-onekana*		*vizuri*	*zaidi*	*namna*	***a-****li-vyo-umizwa.*						
ANIM.SG.SUBJ.PFX-CONSEC-be.seen		well	more	manner	ANIM.SG.SUBJ.PFX-PAST-MANNER.REL-be.wounded						

'By order of Inspector Seif the **body** (Cl. 9) **was turned over** (Cl. 9) and **it was moved** (Cl. 9) and placed on [its] back next to that round stone. That is when **she was visible** (anim.sg.) more easily the way **she had been wounded** (anim.sg.).'

Here the police are investigating a murder, and when talking about the physical act of turning over the corpse, the noun is associated with the non-animate agreements that correspond to its class. However, after the corpse has been turned over and identified, and the focus of attention shifts to the nature of the wounds, the deceased is referred to using animate pronominal prefixes on the verbs 'be visible' and 'had been wounded'. This, too, suggests a shift in the narrator's perspective – indeed, the one who was wounded was a person, not yet a corpse.

The kinds of perspective shifts we have been illustrating are usually associated with human referents. However, it is also possible for inanimate referents to be recategorized. For example, in traditional stories in Menominee (Algonquian), an object attributed with personal qualities, especially that of speech, shifts to animate gender (Bloomfield, 1962, p. 28). This is illustrated in (23) in an excerpt from the Rolling Skull story:

(23) Gender shift in Menominee (Algonquian) (Goddard, 2002, pp. 202–203)

a.	*'a·now*	*kɛh*	*kekɛ·nuanenɛmuaw*	
	in.vain	of.course	I.forbade.you.PL	
	pa·hpenotamɛk	*eneh*	*we·nekan.'*	
	(that).you.PL.toy.with.INAN	that.INAN	skull	
b.	*kɛʔceh*	*pes-a·wek,*		
	near	when.INAN.was.hither.{so}		
	enewen-peh	*pes-neka·mit*	*enoh*	*we·nekan*: . . .
	then.QUOT	ANIM.SG.came.singing	that.ANIM	skull

a. "In vain I forbade you to abuse that skull [INAN]!'
b. When it [INAN] had come near, then that Skull-Being [ANIM] sang as it came: . . .'

The inanimate noun *we·nekan* 'skull' shifts to animate gender when the skull becomes a Rolling Skull and starts to sing. Thus the verb and demonstrative in (a) and the verb in the first clause in (b) are marked as inanimate, whereas the verb and demonstrative in the main clause are marked as animate.

Another type of perspective shift is illustrated by the use of gender marking in Scandinavian. Typically mass and abstract nouns, as well as plural nouns, can be used with neuter marking in the predicate. Such examples involve nouns which have a low individuation status in terms of the individuation hierarchy (Sasse, 1993). As a result, the use of neuter marking in the predicate suggests that the subject is to be viewed as unindividuated: in (24) *sill* 'herring' is interpreted either as mass/generic (with neuter marking) or more specific (with common gender marking):

(24) Predicative marking in Swedish (Widmark, 1966, pp. 4–5)

a.	*Färsk*	*sill*	*är*	*gott*				
	fresh.CM	herring.CM	is	good.NEUT				
b.	*Alldeles*	*färsk,*	*nyfångad*	*sill*	*är*	*särskilt*	*god*	
	completely	fresh.CM	recently.caught.CM	herring.CM	is	especially	good.CM	

[26] Corbett (1991, p. 183) describes nouns like German *das Mädchen* as 'hybrid nouns', i.e., nouns for which 'the agreement form to be used depends in part on the type of target involved'. Examples like (21) show that where alternation is possible, choice of gender marking reflects the speaker's perspective on the referent.

Alternative gender marking can also be used to distinguish between different senses of countable nouns, as in the following example from Norwegian, where the use of neuter marking on the adjective implies that the reference is made to the idea of having a new foreign secretary, rather than to the present foreign secretary:

(25) Predicative marking in Norwegian (Enger, 2004, p. 10)

a.	*En*	*ny*	*utenriksminister*	*hadde*	*ikke*	*vært*	*så*	*dumt.*
	a.MASC	new.MASC	foreign secretary.MASC	would	not	be	so	stupid-NEUT
b.	*En*	*ny*	*utenriksminister*	*hadde*	*ikke*	*vært*	*så*	*dum.*
	a.MASC	new.MASC	foreign secretary.MASC	would	not	be	so	stupid.MASC

Enger (2004) interprets sentences with neuter predicative marking, referred to as 'pancake sentences', as cases of 'semantic agreement'. This is a good point, but it suggests that the other type of gender marking is not semantic. We would prefer to regard both types of gender marking as semantically motivated, since the choice between them leads to different meaningful interpretations.

A somewhat different type of recategorization is discussed by Zubin and Köpcke (2009), who show that in German, cars and car brands are often referred to with masculine gender, even in contexts where related nouns of different genders are used. Analogous examples involve ships, planes and inanimates in other lexical fields. The following example comes from a magazine advertisement for a car dealership:

(26) Recategorization of inanimate referent in German (Zubin and Köpcke, 2009, p. 242)

[headline] *DIE MEILE.*
[Picture: a woman smiling out the window of a car]
[text:] *Ich suchte* ***ein kleines Auto****, – aber elegant und schick sollte* ***es*** *sein, möglichst russischgrün, niedrig in den Kosten, leicht zu parken, natürlich zuverlässig und seinen Preis wert. Da stand* ***er*** *. . . an der Meile. AutoMeile Nedderfeld. Hamburgs Mobilste Meile.* [*Hamburger Abendblatt* 143/1991]

I was looking for **a small car** (neut.) – but **it** (neut.) had to be elegant and chic, if possible Russian green, low in cost, easy to park, dependable, of course, and a good price . . . There **it** (masc.) was, at the 'Mile'.

Here the woman first imagines a generic car, using the neuter noun *Auto* 'car' and matching neuter gender on the article, adjective, and the following pronoun, but then switches to a masculine pronoun when referring to the actual car that she found, even though no masculine-gender antecedent has been mentioned. Zubin and Köpcke (2009, p. 245) argue that the mental lexicon may include productive semantic fields to which a gender may be assigned 'at the concept level', even if the field includes nouns of various genders. The gender of the lexical field may be assigned to referents by 'pragmatic projection' (p. 244), and is available for headless NPs and for use in deictic contexts as well as in contexts where a coreferential noun has been mentioned, regardless of that noun's gender.

Examples such as (26) complicate the distinction between 'syntactic' and 'semantic' agreement, since the conceptual fields described by Zubin and Köpcke are neither morphosyntactic properties of individual nouns nor semantic properties of real-world referents (cars are not male). Instead, it appears that gender can be assigned to a concept that is semantically motivated in that it is shared by the various nouns within that lexical field. In examples like (26) gender marking helps identify the referent by indexing its conceptual field, and can be regarded as 'semantic' in that the membership of the conceptual field is semantically motivated.

Referents can also be re-presented by way of choice of a different classifier. As mentioned above (see example (6)), Omaha-Ponca and other languages of the Dhegiha branch of Siouan have complex systems of classifiers. In example (27) from Ponca the choice of a classificatory definite article depends on the state of the referent of the noun 'stone': first it is conceived as a single round object and then as many scattered objects:

(27) Deictic classifiers in Ponca (Siouan) (Barron and Serzisko, 1982, p. 92)

Ki	*edítã*	*ĩ́e*	*ɸ́ã*	*gatúbe*	*ugáeqtiã-biamá*
and	from.that	stone	DEICTIC.CLF:ROUND.INAN	beaten.fine	it.was.scattered-QUOT.far.and.wide

majã	*bɸ́uga*	*águdi*	*ctewã*	*ĩ́e*	*ge*
land	the.whole	where	soever	stone	DEICTIC.CLF:SCATTERED

'From the rock which was ground very fine came all the stones which are scattered far and wide over the whole earth, wheresoever they are.'

In contrast with the languages of the Dhegiha branch, Lakota and Mandan have much less complex classification systems, with no classificatory articles (Rankin, 2004, pp. 204–205). According to Mithun (1999, pp. 195–199), this difference results in different word order patterns: departures from the basic SOV order are more frequent in Omaha than Lakota and Mandan (20.4% vs. 0.8–0.9% of clauses in a narrative sample). As shown by Mithun, the existence of a more complex classifier system allows word order in Omaha to be exploited more freely for pragmatic purposes, e.g., to foreground or background nominals.

Re-presentation can also be accomplished by means of classificatory verbs, as in the following example from Mescalero Apache (Athabaskan). Example (28) from Hoijer (1938, pp. 157–158) also cited by Rushforth (1991, pp. 258–259), comes from a story about Coyote and Blue Bunting Man.[27] In the story Coyote visits Blue Bunting Man, who asks him for tobacco, and when Coyote replies that he has none, Blue Bunting makes his own tobacco from bark brought by his wife.

(28) Use of classificatory verbs for re-presentation in Mescalero Apache (Athabaskan) (Hoijer, 1938, pp. 157–158)

a. *‘... Shę́ę́dé* *nát’oh* *shań’**įį**.’*
Friend tobacco give.it.to.me (indef. object)
“Friend, give me tobacco.” (Blue Bunting Man is speaking to Coyote)

b. *‘Dooha’yá* *nát’oh* *si’**įį*** *dihnoosh’**įį**hát’éda.’*
NEG.any tobacco it.lies (indef. object) tobacco.offering.I.will.give (indef. object) it.to.you.it.is.so.NEG
“There is no tobacco here [that] I can give you.”

c. *‘Dá’ághát’éndah* *^{n}diishį́* *ńdaa.*
well.anyhow on.the.ground sit.down
“Well anyhow, sit down on the ground.”

d. *K’adi,* *są́ń,* *’ashį́* *’aaí* *tsįbikáyí* *łi’* *ń**kaa**.’*
now wife that.therethat bark one you.bring.contents.of.container
“Now, wife, bring some of the bark from over there.”

e. *‘Káási**ką́**.’*
here.it.is (contents of container)
“Here it is.” (Blue Bunting’s wife is speaking to her husband.)

f. *‘Shań**kaa**.’*
give.it.to.me (contents of container)
“Give it to me.” (Blue Bunting is speaking to his wife.)

g. *Kányíń**ką́**.*
she.put.it.down.in.front.of.him (contents of container)
‘She put it down for him.’

h. *’Ákoo* *nágo* *’I^{n}daa’izhásheedatł’ijí* *haastįįń* *’áń* *náin**jaa**.*
and then Blue.Bunting old.man that.person he.picked.it.up (loose mass)
‘And then the Blue Bunting man picked it up.’

i. *Nágo* *níhidę́ę́zhiij.*
then he.pulverized.it
‘Then he pulverized it.’

j. *Nágo* *’izisí* *ghehyę́ę́**jaaj.***
then bag into.he.put.it (loose mass)
‘Then he put it [the bark] in a bag.’

k. *’Izisí* *łi’* *náintsoodz.*
bag another he.picked.it.up
‘He picked up another bag.’

l. *Dįį́n* *’iłch’įįyii^{n}di.*
4.times he.pressed.together
‘He pressed [the two bags] together four times.’

m. *Bighe’á* *’idałchishį́,* *naałtsoosí* *hayę́ę́**jaa**.*
inside.it thusly.he.mixed.them.all.around.there paper he.took.it.out (loose mass)
‘Putting his hand in it, he took out some paper.’

n. *Naałtsoosí* *nát’ohíyił* *yá’édįní*
paper tobacco that.was.just.tapped.into.existence
Shę́ę́dén *bidáayá* *bánch’íń’**įį**.*
Coyote before.him he.put.it.down (indef. object)
‘He put down before Coyote paper and tobacco that had not existed before.’

[27] The transcription follows that used by M. Eleanor Culley (Marybeth E. Nevins) in *Harry Hoijer’s Chiricahua and Mescalero Apache Texts* (Culley, 2013). We are very grateful to Marybeth Nevins for her help with the example.

In (a-b) tobacco is introduced into the discourse with the stem -'*ɨɨ́* for 'indefinite object', used for objects of unknown characteristics, before further characteristics of the referent are discovered. In (d) the conversation shifts to bark, referred to with the noun 'bark' and the stem *-kaa* for 'contents of a shallow, open container'. Different forms of the same stem are also used in (e–g) to maintain reference to the bark, now that the argument is no longer mentioned explicitly. The bark is referred to again in (h) and (j), this time however by way of perfective forms of the stem *-jáásh* for 'loose mass': it is now handled as a loose amount of bark, rather than as the contents of a container. Thus the choice of the classificatory stem performs two functions, i.e., reference tracking and re-presentation: the stem maintains reference to the bark despite its changed physical properties. A perfective form of the stem *-jáásh* is used again in (m), this time with reference to a loose mass of paper. Using his supernatural power, Blue Bunting Man then creates a cigarette out of paper and tobacco. The creation of a new object (a cigarette) is implied in (n) by the use of the stem -'*ɨɨ́* for 'indefinite object' (cf. examples (a-b) above). Thus the stem indicates not only what object is referred to in the absence of a full nominal, but also its changed physical properties.

In summary, classification markers can be used to present referents from more than one point of view. Once the referent has been introduced into the discourse, use of a different classification marker can provide new information about it. In noun class/gender languages re-presentation typically conforms with Corbett's Agreement Hierarchy in that NP-internal modifiers that help identify the discourse referent usually index the morphosyntactic properties of the noun that refers to it, whereas re-presentation occurs at greater syntactic distance from the noun. In classifier languages, the choice of classifier is not as constrained by syntax, but some classifier–noun combinations may become conventionalized through frequent use. One might expect that re-presentation of an entity would be pragmatically constrained to contexts in which the referent is identifiable unambiguously. Rushforth (1991, p. 264) suggests that this is true for what he calls 'nonliteral' reference in Mescalero Apache such as use of classificatory stems in a joking or metaphorical way, but it could also apply to re-presentation more generally.

6. Effects of nominal classification on language processing

If nominal classification has functional motivations, we might expect it to play a role in language comprehension and/or production. Perhaps not surprisingly, psycholinguistic studies of the processing effects of nominal classification have generally focused on the more well-studied languages (European gender languages and Asian numeral classifier languages). Although it is hard to know how much could be extrapolated from these studies to languages with other types of classification systems, we nevertheless summarize a (far from exhaustive) sample of the kinds of findings that these researchers have reported. We begin with studies of grammatical gender and follow with studies of classifiers.[28]

6.1. Studies of grammatical gender

Studies of grammatical gender have generally focused on the role of gender in language comprehension and production, but some studies have addressed the relationship between gender and mental representations of objects. For example, Boroditsky et al. (2003) report on a series of studies in which speakers' concepts of inanimate objects appeared to be influenced by the grammatical gender of nouns in Spanish and German that name those objects. Similar effects were found in tasks involving pictures rather than words. However, some researchers (e.g., Ramos and Roberson, 2011) have suggested that the observed grammatical gender effects for inanimate objects may have been affected by task demands or verbal presentation, and so reflect online linguistic access rather than an impact of gender on semantics.

Friederici and Jacobsen (1999) review studies of gender and language comprehension in various Indo-European languages, and conclude that congruent gender combinations facilitated lexical decision and naming when the target was presented auditorily (as opposed to visually), and when gender is 'phonologically transparent' (i.e., when the form of a noun is a clue to its gender); incongruent gender combinations showed an inhibitory effect on comprehension regardless of language and task type.

Schriefers and Jescheniak (1999, p. 575) cite van Berkum (1997) as estimating that a Dutch speaker, using a relatively impoverished gender system, accesses the gender of a noun approximately every 10 s in spontaneous speech. Schriefers and Jescheniak review psycholinguistic studies of gender priming, speech errors, the availability of grammatical information in the 'tip of the tongue' state, naming experiments, and experiments on the production of gender-marked pronouns in normal L1 adult language production. Studies of speech errors show that with greater than chance frequency, in substitution of one noun for another ('slips of the tongue'), the substituted noun has the same gender as the target noun. Several tip-of-the-tongue studies show that speakers are often able to retrieve the gender of a noun without being able to recall its phonological form (p. 588). The authors interpret the studies as showing that a noun's gender is accessed when it is needed for an agreement target in the noun's syntactic environment, in which case access to gender precedes phonological encoding.

In a more recent study of gender in Spanish, Wicha et al. (2004) compared Spanish speakers' event-related brain potentials (ERP) while reading sentences that included either an article + noun that was anticipated by the sentential context or one that was unanticipated, together with a congruent or incongruent gender combination of article + noun. They found that

[28] We have not included studies of classifiers in signed languages in this review. Although sign language classifiers resemble spoken language classifiers in many ways, there are also significant differences in their lexicosemantic and syntactic properties (see Sandler and Lillo-Martin, 2006, Chapter 5), and the difference in medium adds to the difficulty of drawing analogies between the psycholinguistic findings.

speakers' brains were sensitive to both semantic and syntactic (in)congruity and that their interaction affected the way a noun was semantically integrated into a sentence. They also found ERP effects as the article was being processed, even before the noun was encountered, suggesting that speakers access information about the noun's gender while anticipating which noun is most likely to occur in a given context. In a further study, Wicha et al. (2005) found that grammatical gender agreement facilitated the integration of a picture that replaced a noun in spoken sentences, and also that it aided in naming the picture in a sentence comprehension task. Since pictures, unlike nouns, do not have gender, this suggests that gender as a morphosyntactic feature may be linked to semantic level representations.

Vigliocco et al. (2005) designed a set of experiments to test whether speakers of Italian and German assessed similarity between nouns based on the 'similarity and gender hypothesis' (that same-gender words would be judged as similar in meaning because of their similar syntactic and morphophonological properties) vs. the 'sex and gender hypothesis' (that the strong correlation between grammatical gender and biological sex that is found with human nouns in gender languages would lead speakers to develop an association between gender and sex that might be extended to animal terms but not to terms for inanimate objects). They used English speakers as a baseline against which to measure effects of grammatical gender in the other two languages. Subjects were asked to assess meaning similarity between a target word and two other words of which one had the same grammatical gender as the target (in one of the gender languages) and the other did not. Grammatical gender affected the judgments of Italian speakers for animal terms but not for artifacts; however this effect was not found with German speakers. Similarly, in a speech-error experiment involving rapid picture naming, Italian speakers tended to substitute a noun of the same gender as the target, whereas German speakers did not. The authors suggest that biological sex is less consistently correlated with grammatical gender in the German three-gender system than it is in the Italian two-gender system; furthermore the forms of Italian nouns provide a stronger clue to their grammatical gender than the forms of German nouns. The gender effects observed in the abovementioned experiments disappeared in the last experiment, which involved similarity judgments of pictures rather than words. The authors conclude that grammatical gender effects are limited to verbal tasks and do not extend to tasks that do not involve verbal mediation.

Acuña-Fariña (2009) reviews several psycholinguistic studies of the effects of grammatical agreement on production and comprehension, with a special focus on gender and number. He compares results for languages like Spanish or German that have a great deal of affixal morphology with English, which has much less. He argues that both gender agreement and word order serve to build the structure of phrases and clauses, and that the former technique is reinforced by frequent use in 'well-oiled' systems such as Spanish, while lack of morphological cues to structural relations leads to greater rigidity of word order as in English (p. 415).[29] With regard to domains of agreement, Acuña-Fariña states that 'gender disappears where a fixed word order takes over [e.g., loss of gender-marking within the NP or between Subject and Verb in English], and it stays where there cannot be a fixed word order', as in the case of English pronouns (p. 417). He concludes that exactly because gender categorizations in the lexicon need not be entirely consistent from a semantic point of view, their marking on agreement targets can be a productive resource for clause-building: 'when recruited as a clause-building instrument, gender is essential in the languages where it is the main clause-building instrument precisely because it is not so strongly attached to meaning' (p. 418; cf. Section 5.1 above). Gender-based agreement not only helps build phrases and clauses, it also '... offers a wide menu of deletion of core elements [such as nouns]. This is a precious commodity in a world where the choice between radically different interpretations hinges on analyses conducted in well under half a second' (pp. 418–419).

6.2. Psycholinguistic studies of classifiers

With regard to classifiers, some studies have addressed the question whether the categories reflected in classifiers have cognitive effects for speakers. A study by Zhang and Schmitt (1998) investigated whether presence or absence of a classifier system affected perceptions of similarity between pairs of objects that were shown to speakers of Mandarin (Chinese) and English. Half of the pairs were objects subsumed under the same classifier in Mandarin, and the other half differed with respect to classifier. They found that the Mandarin speakers perceived objects that share a classifier as more similar than English speakers did, whereas the two groups did not differ in perception of similarity between objects that differed as to classifier. They conclude that presence of a classifier system has a strong effect on speakers' conceptual organization. The authors drew their list of classifiers from Chao's (1968) *Grammar of Spoken Chinese* and from a dictionary of Chinese classifiers (Zhang, 1991). They state that they eliminated classifiers that 'are not commonly used or are highly domain specific' (p. 379), and then 'randomly' chose 14 of the remaining 35 as experimental stimuli. However, they do not indicate how they determined 'common use' or whether it refers to spoken or written Chinese (and their sources apparently differed in this respect). Since it is known that only a small number of different classifiers are regularly used in conversational Mandarin (see Erbaugh, 1986; Beckwith, 2007), relative rarity of some classifiers may have affected their results.

Zhang and Schmitt's (1998) conclusion is challenged by Saalbach and Imai (2007), who argue that Zhang and Schmitt's research design was limited in scope and did not allow them to determine whether the observed classifier effect also extended to inductive reasoning or automatic processing. Saalbach and Imai conducted a series of experiments on native

[29] A similar argument is made by Köpcke and Zubin (1984, pp. 43–44), who state that gender marking in German helps in the processing of complex nominal phrases and compounds. For example, the use of the neuter article helps the hearer identify the end of the following phrase, i.e., the neuter noun *Tor* 'goal': *Das den Hamburgern durch eine unglückliche Schiedsrichterentscheidung aberkannte Tor* 'the goal which was denied the Hamburgers [team] through an unfortunate referee decision'.

speakers of Mandarin and German, involving categorization, property induction, and judgment of similarity according to a wider range of criteria than sharing/not sharing a classifier (i.e., 'taxonomic' similarity such as that between a comb and hair dryer, and 'thematic' similarity such as that between a comb and hair). They found that taxonomic and thematic similarity outweighed classifier sharing for both the Chinese and German speakers; furthermore, both sets of speakers rated shared-classifier objects as more similar to each other than to unrelated control objects. However, this latter effect was stronger for Chinese speakers than for German speakers, suggesting that Chinese speakers are sensitive to the classifier categorization of their language. A classifier effect was also found in a property-induction experiment, but not in a processing experiment involving recognition of a written word from one of the object sets following a pictorial prime. The authors conclude that for certain cognitive tasks, speakers of classifier languages have more heightened sensitivity to classifier categories than do speakers of non-classifier languages, but that it would be unwarranted to infer major differences in cognitive organization between the two groups.

Gao and Malt (2008) argue that studies of the cognitive effects of classifiers do not take into account the fact that in a language like Mandarin, classifiers do not constitute a homogeneous set from a semantic point of view. Instead, the authors divide Mandarin 'individual' classifiers (as opposed to group, container, or measure classifiers) into three sets. In the 'Well-Defined' set, 'all objects that are referred to using a given classifier share one or more features' (p. 10). In the 'Prototype' set, there is a 'typical sort of thing associated with the category' (p. 10), but the category also includes objects that are more distantly related to the 'typical' ones; an example is the classifier *tiáo*, typically used for long, thin things (ropes, braids, snakes etc.) but also for ships, news, and blankets. And finally, in the 'Arbitrary' set 'there is no set of defining features nor any prototype evoked by the classifier word' (p. 11); an example is the classifier *zūn*, used only to classify large guns and statues of Buddha. Gao and Malt collected a sample of 126 individual classifiers encountered in written and spoken Mandarin over a 10-month period, and confirmed their familiarity with six native speakers of Mandarin from Beijing. They then conducted an experiment aimed at determining the effects of classifiers from the three groups in storage and retrieval of information from memory, comparing Mandarin speakers with English speakers. Subjects were shown sets of sentences including nouns with and without classifiers, from each of the classifier types, and asked to list the nouns that they recalled. Gao and Malt found that speakers of both languages showed similar ability to recall lists of nouns overall, but that Mandarin speakers showed significantly greater 'clustering', i.e., listing of two or more nouns from the same category together, especially with nouns from Well-Defined categories. This effect was increased when the classifier was also present in the sentence. The authors conclude that the effect of knowledge of classifier categories depends on the degree to which the categories are semantically coherent.

7. Conclusions

We have shown that nominal classification systems serve two main types of functions: semantic, i.e., the use of classification markers to expand the referential power of the lexicon, and discourse/pragmatic, i.e., the use of classification markers to establish and manipulate the status of discourse referents. Most of these functions are shared across morphosyntactic types. As pointed out in Section 2.3, all types of nominal classification may help identify referents, either directly (by providing information about the referent) or indirectly (by providing information about a noun that in turn helps identify a referent). One would therefore expect there to be a lot of overlap in function, where 'function' is construed broadly to include not only referential but also social/affective and processing functions (see Section 2.1). We summarize the functions we have identified in Table 9 below.

Table 9
Summary of functions of nominal classification.

Type of function	Typical examples
Semantic functions	
Expansion of the lexicon	**Noun classes:** Patterns of cross-class relationships that yield semantically related sets of nouns, e.g., tree:fruit **Noun class** as a structuring principle for the lexicon, e.g., taxonomic superordinate vs. subordinate relations **Mainly noun classes:** Re-use of lexical forms with different classification markers to derive new nouns
Differentiating referents	**Both noun classes and classifiers:** Choice of a classification marker to yield different construals of a noun, e.g., with respect to sex and physical properties
Individuation	**Noun classes:** Expression of degrees of individuation by assignment of nouns to classes/genders or choice of pronominal gender **Classifiers:** Individuation for the purpose of counting or deictic reference
Ascribing properties to referents	**Both noun classes and classifiers:** Choice of classification marker to express speaker's subjective attitude toward the referent, e.g., affection, contempt, surprise, verbal play
Discourse functions	
Referent identification	**Both noun classes and classifiers:** Anaphoric and deictic reference; avoidance of ambiguity **Noun classes:** Aid to clause building, grouping of modifiers with modifieds **Both noun classes and classifiers:** Allusion to general semantic domain without mention of noun
Reference management	**Mainly classifiers:** Presence/absence or position of classification marking to indicate definiteness, specificity or referentiality **Mainly classifiers:** Presentative vs. continuing, persistent vs. non-persistent, foregrounded vs. backgrounded
Re-presentation of referents	**Both noun classes and classifiers:** Change of a classification marker to indicate change in perspective on the referent

One shared function is the use of classification markers to expand the referential power of the lexicon by providing finer differentiation of lexical meanings, such as sex differentiation, animacy, or physical properties such as shape or size. A second shared function is to express individuation or unitization. Individuation interacts with number both because noun class/gender and number are usually expressed by the same morphological forms, and because classifiers help create countable units from nouns that are otherwise unmarked for number. A third shared function is expression of affective meanings or speaker attitudes toward the referent, such as upgrading/downgrading and relationships among speech act participants. A fourth shared function is use of classification markers to identify referents and track them in discourse, which makes it possible to avoid repeating nouns. This allows the use of lexical nouns for topic shift or emphasis, while classification markers maintain reference to a familiar topic. Where the classification is semantically motivated, a classification marker alone may be sufficient for instantiating a particular type of referent (see Section 5.1). In a language where classification is marked pronominally on the verb, the reduced need to repeat nouns may result in a relatively high verb to noun ratio (see Section 5.1). Finally, both noun class markers and classifiers can be used to present referents from a new perspective, once they have been introduced into the discourse. When this is done by means of noun class markers, initial introduction of the referent into discourse tends to be accompanied by modifiers that match its class/gender, whereas subsequent allusions to that referent may introduce additional information about it.

At the same time, formal differences between noun classes and classifiers predictably result in differences in function. As a result of a different realization, the use of classification markers to create new lexical items is more characteristic of noun classes where nouns are overtly marked. The same is true of the use of contrasting noun class or gender assignment to express distinctions between related lexical meanings. On the other hand, distinctions which are conveyed by separate lexical items in a non-classifier language can be made by using different classifiers with a single lexical item. As a result, the presence of a rich system of classifiers may perhaps correlate with a smaller corpus of common nouns, with these distinctions realized through grammar. Another functional difference is based on the different degree of obligatoriness. In order for presence or absence of classification markers to be meaningful as an expression of definiteness, specificity, or referentiality, it must also be optional, so this signaling device is more typical of classifiers than noun classes.

The above summary of functions points to some interactions between nominal classification and other grammatical processes. One is the relationship between nominal classification and number. As various scholars have observed (see Section 4.3), the presence of numeral classifiers is generally in complementary distribution with the obligatory expression of number on nouns. Although number as an obligatory category may occur independently of other forms of nominal classification, it is worth noting in this regard that nominal classification systems typically provide information about both quality and quantity: for example, markers of noun class/gender are often portmanteaus that simultaneously indicate number; numeral classifiers involve both physical properties and arrangement as parameters. That is, degree of individuation (or lack of it) may itself be regarded as a kind of classification. Another grammatical process that partially overlaps in function with nominal classification is word order. Although word order may be used for a variety of purposes, such as indicating the role of arguments in relation to a predicate, topicalization etc., it may also serve to group modifiers together with their modifieds. As pointed out in Sections 5.1 and 6.1, classification marking on modifiers may free up word order to be used for pragmatic purposes such as foregrounding/backgrounding. Also, where classification is expressed by syntactic as opposed to morphological means, changes in the position of classification markers or the phrase containing them can be used to indicate differences in definiteness, specificity or referentiality.

We have also discussed psycholinguistic studies that bear on the functionality of nominal classification. Studies of noun classification indexed by grammatical agreement show that it plays a role in both language comprehension and production, although there are some differences among languages depending on whether the class of a noun can be inferred from its form. The phrase- and clause-building functions of class-based agreement are apparent even where categorization is semantically opaque. Studies of classifiers have tended to focus on the cognitive salience of categorization itself, and this too shows some variation based on degree of semantic consistency in the classification system.

For future research, we echo Singer's (2010, p. 386) call for more studies of nominal classification based on context-rich discourse data. Many of the phenomena we have discussed in this paper would not have been identified using only the elicited, decontextualized sentences that often serve as the basis for grammatical descriptions. Particular topics that deserve more attention with regard to noun class/gender systems include the discourse functions of agreement markers in relation to the relative semantic motivation of the system, the extent and discourse functions of reclassification of referents, and the 'functional load' of noun class/gender marking in systems with small vs. large numbers of classes/genders. With regard to classifiers, more discourse-based studies would clarify questions about degree of variability in classifier choice, the respective semantic contributions of classifiers and nouns, and the respective discourse functions of classifiers vs. number marking in languages that have both. In this latter context it would be especially interesting to compare functions between languages that have numeral classifiers with and without obligatory number marking on nouns. Another issue concerns the possible correlation between the presence of a classifier system and the size of nominal lexicon; this should be tested on corpus-based studies that compare languages with and without classifiers. With regard to psycholinguistic studies, there is a great need for research on the role of classification in language production and comprehension that involves a wider range of languages and classification types.

In conclusion, nominal classification in all its manifestations is a rich resource that speakers can draw on for a wide variety of communicative purposes. We have aimed to describe a representative set of these functions, organized in a framework that can be applied to further investigations of these phenomena among the languages of the world.

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