The semantic reduction of the noun universe and the diachrony of nominal classification

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Classifiers and noun class markers are often semantically general and semantically opaque compared to open-class nouns, and in this sense they constitute a semantic reduction of the noun universe. These two semantic characteristics also play important roles in the diachronic development of nominal classification systems. First, the need for semantically general forms for anaphoric reference may be a possible motivation for developing nominal classification in the first place. Second, opaque classification, which may, for example, emerge through coalescence of classes with homophonous markers, may be replaced by transparent classification because of the incompatibility of opaque classification and certain syntactic constructions, such as contrastive focus. Finally, opaque classification, typical of grammatical gender systems, is less likely to diffuse through language contact than transparent classification, which is typical for other types of systems, including numeral classifier systems.

1. Introduction

Nominal classification systems are language-specific, conventional reductions of the potentially infinite semantic detail provided by open-class nouns into a finite, often rather small, number of classes. This paper discusses how this central reducing aspect of nominal classification may bear, in important ways, on the diachronic development of nominal classification systems. The discussion focuses on two aspects of this semantic reduction – semantic generality and semantic opacity – and the interaction of these with morphosyntactic properties of nominal classification. Such properties include the regular collocations of nouns with classifying expressions, which ultimately define noun classes, and different morphosyntactic types of classification systems (for extensive discussion, see Aikhenvald 2000; Grinevald 2000). This discussion builds to some extent on previous research on nominal classification in the Northwest Amazonian language Bora-Miraña (Seifart 2005), putting selected aspects of that research into a new perspective and drawing on

DOI 10.1075/cilt.342.02sei

additional examples from other languages. Little research has been done so far on the interaction between semantic opacity and generality and the diachronic development of nominal classification. Therefore some of the ideas presented in this paper are speculative and exploratory.

The following section (§2) provides a definition of nominal classification. Section 3 discusses a motivation for classification systems to develop in the first place, which is based on the interpretation of semantically general classifiers as anaphora. Section 4 takes a closer look at the notion of semantic generality and introduces the terms semantic opacity and semantic transparency. These notions describe the extent to which a classifying morpheme carries appropriate 'descriptive content' with respect to the noun it classifies. I then discuss a number of ways semantically transparent classification can become opaque. A central aim here is to show how semantically opaque classification has a distributional restriction in a number of contexts, where it is often diachronically replaced by semantically transparent classification. Finally, §5 relates semantic opacity to the areal diffusability of nominal classification, suggesting that the general prediction that more strongly grammaticalized items are more resistant to borrowing than lexical items also holds for opaque classification vs. transparent classification. Section 6 concludes.

2. A definition of nominal classification

Before entering the main discussion, it is useful to provide a definition of nominal classification under the following four criteria (also applied in Seifart 2010), an adaptation of McGregor's (2002: 16–22) definition of 'grammatical superclassification':

a. nouns collocate in well-defined grammatical environments with classificatory elements (these may be free forms, clitics, affixes, etc., and these may also occur elsewhere);
b. the number of classificatory elements is larger than one but significantly smaller than the number of nouns;
c. classificatory elements show different patterns of collocation with nouns, i.e., they impose a classification (some overlap is allowed; typically, but not always, there is a relatively equal division of the nominal lexicon by classificatory elements);
d. at least a substantial subpart of nouns are classified in this way.

This definition captures the generalizing effect of classificatory morphemes (my current focus) with the requirements that there must be significantly fewer of these than the number of nouns, and that these must show different patterns of collocation with nouns. Additionally, this definition covers different morphosyntactic

instantiations of nominal classification, including strongly grammaticalized gender and noun class systems, as well as lexico-syntactic classifier systems, such as numeral classifiers. Previous definitions (e.g., Allan 1977: 285; Aikhenvald 2000: 13) tend to apply to the latter rather than to the former. In the following, I use the term 'classifying morpheme' as a cover term for the elements of classifier systems as well as of noun class and gender systems.

3. The pragmatics of semantic generality

Reference-tracking, i.e., the establishment of an anaphoric link to a previously mentioned noun, is a common function of nominal classification systems, irrespective of morphosyntactic type (see Contini-Morava & Kilarski 2013 for a comprehensive overview). The following examples illustrate the anaphoric use of Miraña noun class markers (1), of Jacaltec noun classifiers (2), and of Caddo verbal classifiers (3) (antecedent noun phrases and classifying morphemes that establish anaphoric links are in boldface).

(1) Miraña noun class markers (Boran, Peru; own data)
a. *ɯhkú-ʔi tɯhkɛ́nú tsa-nɛ́ **ahtʃú-ʔóːɯ***
take-PRED begin.NMLZ one-CL.INAN **shine-CL:CHUNK**
"… took first **one flashlight** …"
b. *aːró-náa tsáʔ **tɛ́-ʔoːɯ** péːtɛ-tú-nɛ*
but-after NEG **PN-CL:CHUNK** SUB.burn-NEG-CL.INAN
"… but then **it** (chunk, i.e., flashlight) did not work."

(2) Jacaltec noun classifiers (Mayan, Guatemala; Craig 1986: 264)
a. *swatx' ix **ix** ixim **b'itx***
made CL **girl** CL **tamale(corn_bread)**
"The girl made the tamales (corn bread)."
b. *xtsonń **ix** **ixim** yiń how-eb' sentavo*
sold **CL:FEMALE_NON_KIN** **CL:CORN** for five-PL cents
"She sold them for five cents."

(3) Caddo verbal classifiers (Caddoan, Oklahoma; Mithun 1984: 865)
a. *kas-sah-kú-n-dân-na-'na' **kišwah***
should-2.A-1.BEN-DAT-CL:GRANULAR-PL-make **parched.corn**
"You should make me some parched corn."
b. *nas-sah-kú-n-**dân**-na-'nih-áh*
when.FUT-2.A-1.BEN-DAT-**CL:GRANULAR**-PL-make-PERF
sinátti' ci:yáhdi'a'
then I_will_go_on
"When you have made it (the granular substance) for me, then I will go on."

In the following, I characterize classifying expressions as semantically general with respect to the nouns they classify, in order to relate the anaphoric use of classifying morphemes to a general principle of interpretation of semantically general nominal expressions. This, I suggest, is an important factor in the initial development of nominal classification.

I assume for discussion here (but see §3) the simple case that a classifying morpheme is a hypernym of the noun it classifies. This means that the extension of the meaning of the classified noun is a subset of the extension of the meaning of the classifying morpheme. In this view nominal classification is a taxonomy of the nominal lexicon, as illustrated in Figure 1 for a subsection of the Miraña nominal classification system.

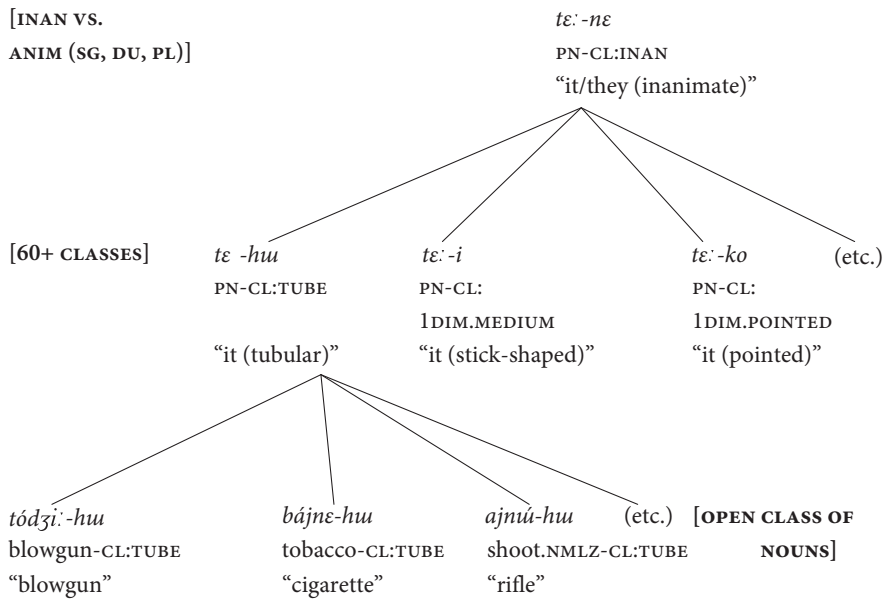

Figure 1. Hypernymic relations between Miraña nominal expressions

The lower part of Figure 1 illustrates that the open class of Miraña nouns is categorized by approximately 60 classifying elements. One of them is *-hɯ* "CL:TUBE", which in Figure 1 appears suffixed to the semantically empty (or weak) root forming third person pronouns (*tɛː-*). This expression is a hypernym with respect to the nouns which *-hɯ* "CL:TUBE" classifies, such as *tódʒiː-hɯ* "blowgun", *bájnɛ-hɯ* "cigarette", *ajnú-hɯ* "rifle", etc. The upper part of Figure 1 illustrates that these approximately 60 classes are again categorized by a small set of 'general class markers' (which may occur in the same morphosyntactic slots as specific class markers,

e.g., with the pronominal root *tɛːɾ*). These categorize the nominal lexicon into a few general classes, including an 'inanimate' class (under which the classes in the lower part of Figure 1 fall), as well as animate singular, dual, and plural classes (not shown in Figure 1).

If one attempts a componential analysis of the semantic features in the intension of classifying expressions (Nida 1975), semantic generality can be represented as the elimination of semantic components, as in (4), to illustrate the semantic reduction of the noun universe through nominal classification.[1] The expression *tɛɾ-hɯ* in (4b) is thus stripped of all semantic specifications of the noun *tódʒiɾ-hɯ* "blowgun" except for [inanimate], [singular], and [tube-shaped]. Miraña presents an additional, even more general classification device, so-called 'general class markers', which at the next higher level generalizes across all inanimate nominal expressions and all number values.

(4) a. *tódʒiɾ-hɯ* [inanimate] [singular] [tube-shaped] [hunting instrument] …
b. *tɛɾ-hɯ* [inanimate] [singular] [tube-shaped]
c. *tɛɾ-nɛ* [inanimate]

The selection of semantic features that are preserved in semantically general classifying expressions is of course language specific, but the principle of semantic generality is common in nominal classification systems: otherwise they would not classify.

Given the above, the relation between a classifier and the classified noun can be viewed from the perspective of a general rule for the interpretation of semantically general nominal expressions, represented in Figure 2 (based on Givón 1983a: 18; Ariel 1988: 84; Gundel et al. 1993: 284; Levinson 2000: 267; Chafe 1994: 71–72). According to this principle, the use of a semantically general expression which provides only partial information about a nominal referent signals that the intended referent is already present in the discourse world and that the intended referent is not a new referent (see Seiler 1986 for an early discussion of the relationship between semantic generality and anaphora).

1. Note that I do not claim to present the only possible or the only correct componential analysis. I submit, however, that any reasonable componential analysis will show that classifying morphemes are semantically more general than the nouns they classify.

semantic specificity:	semantically specific		semantically general
expression type:	lexical noun	pronoun free ---------- bound	zero
usual interpretation:	new or inactive referent, non-coreferential reading		old or active referent, coreferential reading

Figure 2. Types of referential expressions and default interpretation

Example (5) illustrates this principle, showing that a coreferential (i.e., anaphoric) reading of the semantically relatively general noun *vessel* with the semantically relatively specific preceding noun *ferry* is naturally obtained in (5a). On the other hand, a semantically relatively specific noun such as *ferry* in (5b) cannot usually receive a coreferential interpretation with respect to the semantically relatively general preceding noun *vessel*, but it would normally be interpreted as introducing a new referent. A third person pronoun such as *it* in (5c), which is semantically general, is naturally interpreted as coreferential, according to the principle shown in Figure 2.

(5) *Semantically general expressions and coreferential reading* (based on Levinson 2000: 269)
   a. *The ferry$_j$ hit the rock. The vessel$_j$ capsized.*
   b. *The vessel$_j$ hit the rock. The ferry$_{j/i}$ capsized.*
   c. *The ferry$_j$ hit the rock. The vessel$_j$ capsized. It$_j$ sank immediately.*

A componential analysis of the semantic features of the relevant expressions in (5) is given (6), illustrating that semantically relatively general expressions receive a coreferential (anaphoric) interpretation with respect to relatively specific expressions, but not the other way around.

(6) a. *ferry* [inanimate] [singular] [floating] [artifact] [public transport] …
   b. *vessel* [inanimate] [singular] [floating] [artifact] …
   c. *it* [inanimate] [singular]

There is much empirical evidence for regular patterns of allocation of the amount of semantic information in discourse according to the basic schema sketched in Figure 2. Cross-linguistic evidence for this comes, for instance, from studies in the 'topic continuity' framework (see the contributions in Givón 1983b; see also Daley 1998; Fox 1987: 137–140; Payne 1988). It should be noted that this allocation of information (and accordingly the choice for an anaphoric expression) is subject to additional factors such as the topicality of the referent (Givón 1983a) and the paragraph structure, which may warrant an otherwise unexpectedly explicit mention of

a referent to signal the end of a paragraph (Fox 1987; on the function of Miraña class markers in this respect, see Seifart 2005: 245–306). As expected from a pragmatic principle (as opposed to a morphosyntactic rule), deviations are always possible, some of them under specifiable conditions such as signaling the end of a paragraph, as just mentioned.

The semantic generality itself is at least largely if not solely responsible for the pragmatic effect of coreferential readings, i.e., not (necessarily) the part of speech distinctions, such as noun vs. pronoun, free vs. bound pronoun. This is evident from (5a)–(b), where the pragmatic principle applies to two lexical nouns, i.e., members of the same part of speech. Another piece of evidence for the primacy of semantic generality over the part of speech distinctions in determining coreferential vs. non-coreferential readings comes from Miraña, which allows for two levels of semantic generality in its pronouns, general class markers, and specific class markers. Example (7), a continuation of (1), illustrates how the two types of class markers are used in reference tracking: On the one hand, a 'specific class marker' is used in (7a), which specifies the shape of the referent. On the other hand, a 'general class marker' is used in (7b), which only specifies inanimacy (see Figure 2, above) and is therefore semantically even more general. Example (7c) illustrates how the two levels of semantic specificity in Miraña reference-tracking pronouns are exploited to mark the end of a paragraph by an otherwise unexpectedly specific expression, in this case a 'specific class marker' used to mark a paragraph boundary.

(7) a. *aːró-náa tsáʔ* ***tɛ́-ɾoːɯ*** *pɛ́ːtɛ-tú-nɛ*
but-after NEG **PN-CL:CHUNK** SUB.burn-NEG-CL:INAN
"… but then **it** (chunk, i.e., flashlight) did not work …"

b. ***aː-nɛ*** *pɛ́ːté-tú-né-dʒiːʔɛ*
CONN-CL:INAN SUB.burn-NEG-CL:INAN-BEN
"… and because **it** (inanimate) did not work …"

c. *píko-ːbɛ iːnɛ íːnú-hî-ʔadʒú-βú* ***té-ɾoːɯ***
put-CL:masc.sg HES earth-CL:2DIM.ROUND-on-ALL **PN-CL:chunk**
"… he put, eh, **it** (chunk, i.e., flashlight) on the ground."

The principle governing the coreferential readings of semantically general expressions is powerful and generally applicable. As such it helps ground the existence of nominal classification on general, communicative principles. Since it operates independently of parts-of-speech distinctions, it may predate the development of separate parts of speech that are semantically general and that serve dedicated reference-tracking functions, such as classifiers. Furthermore it may play a crucial role in shaping these. It is well known that classifiers develop from subsets of semantically general nouns. From the above discussion it follows that these may also be used for reference tracking, according to the above principle, in languages

without nominal classification. If they are used frequently in this function, they may eventually grammaticalize into closed sets of classifying morphemes (given a number of other factors, such as a dedicated classifier construction). The property of classifying morphemes as being semantically general may thus play an important role in the initial emergence of nominal classification as a reference tracking device.

The perspective on the emergence of nominal classification taken in this section additionally allows for some observations on the semantic contents of classifying morphemes as reference tracking devices. According to the principle mentioned above, dedicated anaphoric expressions (from which classifiers may develop) are semantically general and as such preserve only a subset of the semantic features present in the antecedent noun. But which features will these be? Which are the features of nouns that are appropriate as partial semantic specifications about a given referent to signal coreference? According to Givón (1976: 171), such features "represent only the top of the hierarchy of semantic features that underlie the noun universe" (see also Lehmann 1988: 61–62; Barlow 1992: 46–50). The semantics of nominal classification used for reference tracking may thus be used to explore which features are at the top of such hierarchies. Here, universal tendencies can be expected, such as the prominence of animacy and natural gender distinctions, as well as culture-specific classification preferences, such as social status (Aikhenvald 2000: 175–280).

In the domain of inanimates, it seems much less clear which features may be at the top of such a hierarchy. In the first three examples given above, the meaning components that are preserved in reference-tracking classifiers are quite diverse: shape (Miraña "chunk" for "flashlight"), material (Jacaltec "corn" for "tamale corn bread"), and consistency or configuration (Caddo "granular" for "parched corn"). Among the semantic features that are most often mentioned as being important in nominal classification of inanimates are shape, size, material, consistency, and function (Aikhenvald 2000: 275–280). However, generalizations about semantic domains have focused on differentiating morphosyntactic types of nominal classification systems, showing, for example, that the semantic domain 'edibility' is almost exclusively found in genitive classifiers and that the semantic domain 'material' is prevalent in noun classifiers (see Croft 1994; Aikhenvald 2000: 271–306; Grinevald 2000: 71–74). On the other hand, systems of various types (at least noun classes, numeral classifiers, and noun classifiers) may be used for reference tracking. Therefore it is still not clear which semantic features are most directly associated with the semantic generality of reference tracking and the emergence of nominal classification. The (reduced) semantic specification of a referent in reference-tracking classifying morphemes does not necessarily represent what is most important about this referent for the speakers, but it represents the appropriate semantic reduction for creating an anaphoric expression.

In sum, the fact that classifying morphemes are semantically general with respect to the nouns they classify can be related to a possible origin of nominal classification as a reference tracking device. On the one hand, this motivates the emergence of conventional and eventually grammaticalized morphosyntactic nominal classification systems. On the other hand, the role of semantic generality in reference tracking enables a new perspective on the selection of semantic domains encoded in nominal classification as those that are preserved in semantically general anaphoric expressions.

4. Semantic opacity and renewal

This section discusses further aspects of the semantic generality of classifying morphemes, in particular the distinction between semantically opaque and semantically transparent classification, and the role that this distinction plays in the diachronic process of the internal reorganization of nominal classification. I first discuss how semantically opaque noun class assignment can be distinguished from semantically transparent assignment (§4.1). Section 4.2 discusses briefly some aspects of the well-known fact that semantically transparent assignment can become opaque over time. Section 4.3 presents evidence for the opposite, less well-studied tendency, namely that opaque classifications can be replaced by semantically transparent classifications.

4.1 Descriptive content of classifiers, semantically transparent and opaque classification

In order to discuss the distinction between semantically transparent and opaque classification, it is useful to first introduce the notion of 'descriptive content' for a classifying morpheme (borrowing this term from Bosch 1988, who applies it to the meanings of pronouns; see below). Essentially, the descriptive content is the meaning that can be attributed to the classifying morpheme, and this is to be established for each classifying morpheme individually. As will become clear below, this notion is useful because there are differences in the extent to which classifying morphemes have descriptive content at all. A further question is how the descriptive content of a classifying morpheme relates to the meaning of the classified noun. This cannot be established once and for all for each classifying morpheme, but has to be established for each association of a classifying morpheme with a noun. Thus it distinguishes between semantically transparent vs. semantically opaque noun class assignment for each noun.

If a classifying morpheme is a free form, its descriptive content can be established in the same way as the meaning of any lexical item. If a classifying morpheme is bound, there may nevertheless be constructions in the language which allow us to isolate the descriptive content of the classifying morpheme. In Miraña, noun class markers can be combined with semantically weak pronominal stems, and these combinations can be used in a nominal or predicative function, as in Example (8) (descriptive content may also surface particularly well under contrastive focus; see below). For Miraña, this yields descriptions of the descriptive content of class markers, such as *-ʔo* "three-dimensional, oblong object" and *-ko-duu* "two-dimensional, pointed object".

(8) *Predicating the meaning of a class marker over a referent in Miraña*
a. *í-nɛ* *pá-**ʔo**-dú* *nɛ́ː-nɛ*
this-CL:INAN COP-**CL:3DIM.OBLONG**-COMP seem-CL:INAN
"This is an oblong one."
b. *í-nɛ* *pá-**ko**-dú* *nɛ́ː-nɛ*
this-CL:INAN COP-**CL:2DIM.POINTED**-COMP seem-CL:INAN
"This is a pointed one."

Having established the descriptive content of a classifying morpheme (assuming, for now, that classifying morphemes have descriptive content), the next question is whether a noun that is grouped into a given noun class by the morphosyntactic nominal classification system of the language semantically relates to the descriptive content of the classifying morpheme. If it does, one can speak of semantically transparent noun class assignment. If not, one can speak of semantically opaque noun class assignment. In Miraña, the following test can be used to assess the semantic transparency or opacity of noun class assignment. This test is based on the predicative use of class markers, i.e., on the possibility of using class markers in a nominal expression that is used as a predicate nominal to attribute the properties denoted by the class marker to the referent of the subject of that clause (see also Example (8)). If the referent of a noun can be described with a predicate nominal that includes the same class marker that is also included in this noun, then the class marker assignment can be called semantically transparent, as in Example (9). In this case, the descriptive content of the class marker 'fits' the meaning of the noun.

(9) *Semantically transparent noun class assignment in Miraña*
a. *úhi-**ʔo*** *pá-**ʔo**-dú* *nɛ́ː-nɛ*
banana-**CL:3DIM.OBLONG** COP-**CL:3DIM.OBLONG**-COMP seem-CL:INAN
"A banana is like an oblong one."
b. *kaːtúnu-**íːʔo*** *pá-**iːʔó**-dú* *nɛ́ː-nɛ*
writing-**CL:LITTLE_STICK** COP-**CL:LITTLE_STICK**-COMP seem-CL:INAN
"A pencil is like a little stick."

If the referent of a classified noun cannot be described with a predicate nominal that includes the same class marker that is also included in this noun, then the class marker assignment can be called semantically opaque, as in (10). This example is judged as awkward or semantically infelicitous by native speakers. In this case, the descriptive content of the class marker (in (10a) roughly "slender, pointed object") does not fit the meaning of the noun (in (10a) "cahuana", a drink made from manioc starch). The noun is thus associated with this class marker not (directly) by a semantic association but by convention, as is typical of grammatical gender.

(10) *Semantically opaque noun class in Miraña*

a. ??*kaʔgúnu-**ko*** *pá-**ko**-duú*
cahuana-**CL:1DIM.POINTED** COP-**CL:1DIM.POINTED**-COMP
néː-nɛ
seem-CL:INAN
Intended meaning: Cahuana is like a pointed one. (*kaʔgúnu-ko* "cahuna drink")

b. ??*kóːmɨ-**hɨ*** *pá-**hɨ**-duú* *néː-nɛ*
palm-**CL:2DIM.ROUND** COP-**CL:2DIM.ROUND**-COMP seem-CL:INAN
Intended meaning: A palm tree is like a round and flat one. (*kóːmɨ-hɨ* "palm tree")

Similar tests can be applied to other languages. For instance, Examples (11) and (12) illustrate the well-known fact that in German the assignment of animate nouns to masculine and feminine gender is semantically transparent, while the assignment of inanimate nouns to masculine and feminine gender is semantically opaque (even though it may have some motivation; see below).

(11) a. *Der Mann ist ein ER*
the man is a he.FOC
"The man is a *he*"

b. *Die Freundin ist eine SIE*
The girl_friend is a she.FOC
"The girl friend is a *she*."

(12) a. ??*Der Bolzen ist ein ER*
the bolt is a he.FOC
"The bolt is a *he*."

b. ??*Die Mutter ist eine SIE*
the nut is a she.FOC
"The nut is a *she*" (in the context of talking about tools).

Figure 3 summarizes the distinction between semantically opaque assignment and semantically transparent assignment. Note that this distinction is a matter of degree

rather than a categorical distinction. The scalar property reflects the gradual nature of the acceptability of constructions like those given for German and Miraña above. Note also that the notion of opaque assignment does not mean the absence of semantic categorization principles. On the contrary, there may well be semantic principles or semantic 'motivation' at work in opaque cases of assignment. For instance, Zubin & Köpke (1986) show that in German the vast majority of 'superordinate terms', such as *Obst* "fruit", *Werkzeug* "tool", and *Tier* "animal", are neuter gender, while the associated "basic level terms" tend to be either masculine or feminine, e.g., *Apfel* "apple(M)", *Pflaume* "plum(F)", *Traube* "grape(F)". Another semantic principle is that nouns denoting highly imageable taxa, such as tree, bush, flower, or mushroom, tend to be masculine, while nouns denoting internally diverse taxa, such as *Kraut* "herb, cabbage, etc.", tend to be neuter (see also Lakoff 1986, 1987 on Dyirbal). But this type of distant semantic motivation is of a different nature than semantically transparent assignment, which involves a straightforward 'fit' of the descriptive content of a classifying morpheme with the semantics of a classified noun. In the context of this paper, it is useful to maintain this distinction, even if it has fuzzy limits, because it plays a crucial role in some diachronic processes in nominal classification, as is shown in the following sections.

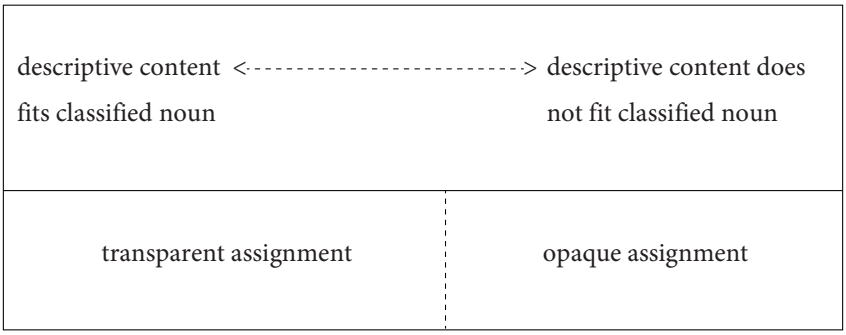

Figure 3. Semantically transparent and opaque noun class assignment

4.2 From semantically transparent to opaque assignment

Since classifiers overwhelmingly originate as open-class lexical nouns and have the semantic properties of lexical nouns, it is fair to assume that at early stages of development, nominal classification tends to be semantically transparent. How then does it become opaque? Due to lack of historical data for most languages, not many concrete processes of 'opacitization' have been described (see Erbaugh

1986; Wiebusch 2009 on Chinese; Downing 1996 on Japanese). Implicitly, at least, it seems to be often assumed that semantic extensions of noun classification categories that are found in synchronic data also correspond to diachronic development. Examples of such extensions described by Lakoff (1986) are, for instance, from fish to fishing implements and from women to birds, based on a belief that birds are the souls of deceased women (see Aikhenvald 2000: 404–408 for more examples). If the classifying morphemes retain descriptive content (e.g., 'feminine') at all, then the result of such extensions, especially if they are applied successively in chains (e.g., from 'women' to 'sun' to 'sunburn' to 'hairy mary grub', an insect that stings like a sunburn), is semantically opaque noun class assignment in the sense of §4.1. In Lakoff's (1986) terms, such nouns would be less central members of a class.

In this section, I present some data from Miraña that illustrate perhaps less well-known processes, namely, different kinds of historical 'accidents' that may also contribute to a process by which originally transparent classification becomes opaque. First, the association of a noun with a classifying morpheme may become semantically less transparent if the noun changes semantically. This may be due to changes in the physical properties of the referents themselves. For instance, the spoons and axes the Miraña people used traditionally were differently shaped from those used today (13a)–(b), while the nouns denoting them, including their noun classes, remain the same. As a result, the noun class assignments of Miraña nouns for spoons and axes are more opaque now than they used to be.

(13) *Reduced semantic motivation through change of referents in Miraña*
   a. *dɛíhhɯ-gwa*
      to_spoon_up.NMLZ-CL:2DIM.STRAIGHT
      "spoon" (*-gwa* "flat, rigid, at least one **straight** edge", traditionally pieces of wood with straight edges were used as spoons).
   b. *ɯgwáː-hɨ́*
      metal-CL:2DIM.ROUND
      "axe" (*-hɨ́* "flat and **round**", traditional stone axes are round).

A second historical process that may result in semantic opacity is when classifying morphemes become homophonous. In order to show this, I first illustrate how Miraña noun class markers most probably entered the system. This was by repeaters, i.e., the repetition of a noun in the class marker slot (14), with subsequent truncation of that noun in class marker slots (15). The form in Example (15b) is glossed as a class marker since it has effectively been extended to other nouns, although its origin as a partial repeater is still clearly recognizable.

(14) *Noun used as 'repeater' in agreement slot*
a. *íhka-**báhɯ*** *tsá-**bahɯ*** *báhɯ*
COP.SUB-**RP.FOREST** one-**RP.FOREST** forest
"There is one (stretch of) forest."
b. *íhka-**báhɯ*** *tsá-**bahɯ*** *úhɨ-**báhɯ***
COP.SUB-**RP.FOREST** one-**RP.FOREST** banana-forest
"There is one banana plantation."

(15) Phonological reduction (partial repeater)
a. *íhka-**mo*** *tsa-**mo*** *móːaj*
COP.SUB-**RP.RIVER** one-**RP.RIVER** river
"There is one river."
b. *íhka-**mɨ*** *tsa-**mɨ*** *mɨːnɛ*
COP.SUB-**CL:TRANSPORT** one-**CL:TRANSPORT** canoe
"There is one canoe."

Examples (16a)–(c) illustrate the potential emergence of an opaque noun class through the coalescence of three homophonous partial repeaters, which could potentially become a single noun class in the further development of the system. If this marker retains descriptive content at all, based on the nouns from which it grammaticalizes, i.e., 'signal drum', 'breast', or 'umarí fruit', this descriptive content would not fit many of the nouns that are associated with it, and the association of many nouns with this class would thus be semantically opaque.

(16) *Emergence of opaque class markers through repeaters in Miraña*
a. *tsa-mɯ kɯːmɯ*
one-RP signal_drum
"one signal drum"
b. *tsa-mɯ **mú**hpajne*
one-RP breast
"one breast"
c. *tsa-mɯ niːmɯ*
one-RP umarí_fruit
"one umarí (species of fruit)"

The process just described is similar to a particular way of integrating loanwords by which (initial or final, according to the systems) syllables of loanwords are reanalyzed as noun class markers. This can be observed in the Swahili Examples (17a)–(b), in which initial syllables of Arabic and Japanese loanwords have been reanalyzed as the Class 7 prefix *ki-*. According to the Swahili noun class system, these nouns are inflected for plural with class marker *vi-*.

(17) *Reanalysis of initial syllable as class marker in Swahili*
  a. *ki-tabu* (PL. *vi-tabu*) < Arabic
  "book"
  b. *ki-mono* (PL. *vi-mono*) < Japanese
  "kimono"

In sum, this section has shown that opacity in nominal classification may be a result of different processes in addition to semantically motivated extensions. Among these are semantic changes in the classified nouns, related to historical change in their typical referents, which results in greater distance between the descriptive content of the classifying morpheme and the semantics of the noun. Opacity may also arise when phonological processes intervene in the noun class assignment. This is the case when classifying morphemes become homophonous due to phonological reduction and when phonological segments of loanwords are reinterpreted as class-marking morphology. In both cases, the results are semantically less transparent subdivisions of the nominal lexicon, a different kind of semantic reduction.

4.3 Replacement of opaque classification by transparent classification

While the previous section discussed diachronic processes from transparent to opaque classification, we now turn to a process in the opposite direction, from opaque to transparent classification. This process has been reported for various languages. It will be argued that that opaque classification has an inherent tendency to be replaced by semantically transparent classification. The argument is based on the restricted distribution of opaque classification, when compared to transparent classification, in three constructions: (i) contrastive focus constructions, (ii) reference tracking after longer stretches of discourse, and (iii) in agreement on certain targets. The focus in this section is on the replacement of noun class or gender assignment, in particular in the context of agreement marking and reference tracking.

I begin by giving two examples of diachronic processes of the re-classification of nouns with opaque class assignment. First, in Miraña, animal names (faunal nouns) are assigned to shape-based 'specific' noun classes. These nouns are semantically opaque, i.e., they fail the test given above. The class assignment is evident from classifier forms that are recognizable as suffixes on the nouns, e.g., *kúːmɯ-hɨ* (turtle-CL:2DIM.ROUND) "turtle". However, these classes are used on noun class agreement with such nouns only in traditional songs (18), which instantiate archaic speech (also in other respects). In contrast, in spontaneously produced contemporary Miraña only animate 'general' class markers are used for agreement marking with such nouns on any target (19). This is a clear example of the replacement of opaque classification by transparent classification.

(18) *Opaque class with animal name in Miraña traditional song*
*mamáβɛ-**hɨ́**=pɛ* *kúːmɯ-**hɨ́***
learn-CL:2DIM.ROUND=PST turtle-CL:2DIM.ROUND
"He learned, the turtle."

(19) *Re-classification with transparent class in contemporary Miraña*
a. *ajː-**di*** *múhɯ-ːbɛ* *kúːmɯ-**hɨ́***
DIST-CL:M.SG be.big.SUB-CL:M.SG turtle-CL:2DIM.ROUND
"that big turtle"
b. *ajː-**di*** *múhɯ-ːbɛ* *niːmú-**ko***
DIST-CL:M.SG be.big.SUB-CL:M.SG bird.sp-CL:1DIM.POINTED
"that big bird (genus *Crax*)"

The second example comes from Swahili, which, like many other Bantu and Niger-Congo languages, has a complex noun class system. Most noun classes involve a considerable degree of opacity, although more or less distant semantic motivations can be discerned for most of them (Contini-Morava 1994, 1997). Class 1 (and its plural counterpart Class 2) are different in that they are semantically transparent, i.e., they are used almost exclusively for humans. Olstad (2011) has quantitatively substantiated the intuition that some Swahili classes (among them Class 5) are more opaque than others, especially Class 1/2. So-called 'alliterative agreement' (agreement marking on multiple targets by the same marker that is also present on the noun) is a pervasive and presumably relatively old pattern in Bantu (and some other Niger-Congo languages). However, in a number of modern Bantu languages, agreement with nouns that have semantically opaque assignment is now optionally or even preferably marked with semantically transparent noun classes. This is illustrated in Examples (20a)–(b) where the noun *zee* "old man", which is lexically assigned to Class 5 (in a semantically opaque way), can now also be associated with the semantically transparent human Class 1/2 for agreement marking.

(20) *Re-classification of animates with transparent class in Swahili (Bantu)*
(Heine 1982: 195; see also Wurzel 1986: 84; Katamba 2003: 113)
(Class 1 is human class)
a. *zee* *yu-le*
old_man(CLASS5) CLASS1-that
"that old man"
b. *zee* *li-le*
old_man(CLASS5) CLASS5-that
"that funny/extraordinary/extremely old man"

Heine (1982: 195) notes that the distribution of the opaque class with respect to (20) is restricted when compared to the semantically transparent agreement marking: "semantic agreement is unmarked as opposed to automatic agreement, which is

marked … By means of the automatic agreement, the meaning of the derivative noun class is emphasized and/or modified."

A similar process can be observed in the Bantu language Lingala (Example (21)). In this case, it is inanimate nouns which are re-classified as belonging to the (overwhelmingly inanimate) Class 7. To the extent that Class 7 is (or is becoming) a semantically transparent class for inanimates, this is another case of a re-classification from opaque to transparent. The re-classification is occurring, according to Heine (1982: 195), in the spoken language and in particular in the progressive urban varieties of Kinshasa.

(21) *Alliterative noun class agreement in conservative Mankandza Lingala and Re-classification of inanimates with transparent inanimate Class 7 in progressive Kinshasa Lingala (Bantu)* (Bokamba 1977: 187–188; see also Aikhenvald 2000: 400)

a. *mu-nkanda* *mu-ko-kweya*
CLASS3-book/letter CLASS3-TAM-fall
"A/the book will fall down."

b. *mu-nkanda* *e-ko-kweya*
CLASS3-book/letter CLASS7-TAM-fall
"A/the book will fall down."

Why is there a recurrent tendency to replace opaque assignment with transparent assignment – particularly in certain constructions? I would like to suggest here that opaque assignment has distributional restrictions in certain linguistic contexts (when compared with semantically transparent assignment) and that these restrictions may lead to the gradual replacement of opaque assignment with transparent assignment.

The first context in which the use of opaque assignment is restricted is in pronouns under contrastive focus. This is discussed below with examples, first from German, which has semantically transparent gender assignment of animates and semantically opaque assignment of inanimates (masculine, feminine, neuter). Although semantic principles can be detected within gender assignment of inanimates (see §4.1), this is clearly of a different nature than the semantically highly transparent assignment of animate, especially human nouns (masculine vs. feminine, based on natural gender). Bosch (1988: 224–225) has observed that gender-marked pronouns cannot be used with contrastive focus to anaphorically refer to inanimate participants in German (22a), all of which have opaque assignment. However this is perfectly acceptable for gender-marked pronouns with animate antecedents, all of which are transparently assigned to a gender (22b). As Bosch (1988: 225) observed, contrastive focus requires expressions with a descriptive content. I may add here that it requires descriptive content that matches the semantics of the antecedent noun.

(22) *Opaque assignment and contrastive focus in German* (Bosch 1988: 224–225)
   a. *Wenn du die Mutter*(F) *von dem Bolzen*(M) *lösen willst, dann musst du* ⁇*IHN*(M) *festhalten und* ⁇*SIE*(F) *nach rechts drehen*.
   "If you want to loosen the nut from the bolt, you must hold ⁇IT (pronoun marked for masculine, intended reference to bolt) and turn ⁇IT (pronoun marked for feminine, intended reference to nut) to the right."
   b. *Der Mann*(M) *hatte Streit mit seiner Freundin*(F), *weil SIE*(F) *noch in eine andere Kneipe gehen wollte, aber ER*(M) *keine Lust mehr hatte*.
   "The man had a row with his girl friend, because SHE (pronoun marked for feminine, intended reference to girl friend) wanted to go on to another pub but HE (pronoun marked for masculine, intended reference to man) didn't feel like it any more."

The same restriction can be observed in Miraña, where there is semantically transparent assignment of some inanimate nouns but opaque assignment of other inanimate nouns and to nouns denoting animals (see above). As in German, the use of a pronoun with contrastive focus is not acceptable (or less acceptable) if the assignment is opaque (23a), but it is perfectly acceptable if the assignment is transparent (23b)

(23) *Opaque assignment and contrastive focus in Miraña*
   a. *tsáihuú-ɯ* *niːmú-ko-o* ***tohpá-ɯ***
   once-REM currassow-CL:1DIM.POINTED-and **pigeon-CL:3DIM.ROUND**
   úmɛ́nɛ́bá *ʔadʒú-ri* *áː-mútsi-dí-tʲú-ɯ*
   log top-LOC CONN-CL:M.DU-ANIM-ABL-REM
   ⁇***tɛ́ː-ɯ-rɛ*** *áːkité-ʔi*
   PN-CL:3DIM.ROUND-FOC fall-PRED
   "A Currassow (family *Cracidae*) and a pigeon (species *Crypturellus cinereus*) were sitting on a log. Of these two, ⁇IT (pronoun marked for CL:3DIM.ROUND-class, intended reference to pigeon) fell down."
   b. *tsáihuú-ɯ* *úhɨ-ʔo-o* ***kúni-ɯ***
   once-REM banana-CL:3DIM.OBLONG-and **potato-CL:3DIM.ROUND**
   mɛ́ːtsá *ʔadʒú-ri* *áː-nɛ́ː-kɯ-tú-ɯ*
   table top-LOC CONN-CL:INAN-DU-ABL-REM
   tɛ́ː-ɯ-rɛ *áːkité-ʔi*
   PN-CL:3DIM.ROUND-FOC fall-PRED
   "A banana and a potato were sitting on a table. Of these two, IT (pronoun marked for CL:3DIM.ROUND-class, intended reference to potato) fell down."

A second context where semantically opaque assignment is disfavored is anaphoric reference if the anaphoric expression is separated by longer stretches of discourse

from its antecedent. It has been observed – also for German – that third person pronouns can be used only with difficulty after longer stretches of discourse if the assignment of the intended antecedent is semantically opaque. As Comrie (1994: 4) puts it,

> [I]n German, for instance, use of a masculine singular pronoun to refer across a long stretch of text to an inanimate antecedent of masculine gender is likely to cause bewilderment rather than retrieval of the appropriate referent, even if there are no intervening masculine singular referents.

It is the opaque assignment of inanimates, and not the animacy distinction itself, that is responsible for this restriction. This can be shown by comparison with Miraña, which has semantically transparent assignment of some inanimate nouns, as just mentioned. In Miraña texts, it is perfectly normal and common to use class-marked third person pronouns anaphorically to refer back to inanimate antecedents (Seifart 2005: 300–304). For example, *tɛ:-hɯ* (PN-CL:TUBE) "it (tubular)" is used in one text to refer back to *ajnú-hɯ* (shoot.NMLZ-CL:TUBE) "rifle" minutes after its last mention with a full noun phrase and after a number of other intervening inanimate participants. This is possible because of the semantically transparent assignment, i.e., the matching of the descriptive content of the noun class morphology with the semantics of the classified noun.

Contrastive focus constructions and reference tracking over longer stretches of discourse may be among the first contexts where semantically transparent assignment is used in addition to opaque assignment, introducing alternative class membership for a given noun. Which other contexts may be affected by this gradual replacement can be captured with the Agreement Hierarchy (Corbett 1991: 225–230), which describes a restricted distribution of opaque classification if there is a choice between an opaque class and a transparent one for agreement marking. According to the Agreement Hierarchy, opaque class agreement ('syntactic agreement' in Corbett's 1991 terms) is increasingly unlikely towards the top of the Agreement Hierarchy (Figure 4). Note that this hierarchy is probably also roughly congruent with the linear distance of the classifying element (or agreement target) from the classified noun (or head noun) in most cases.

ATTRIBUTIVE MODIFIERS	<	PREDICATES	<	RELATIVE PRONOUNS	<	PERSONAL PRONOUNS

Figure 4. The Agreement Hierarchy (Corbett 1991: 225–230)

The diachronic hypothesis derived from the observations above in combination with the Agreement Hierarchy is that opaque assignment is gradually replaced by transparent assignment along the positions of the Agreement Hierarchy. Such replacement would thus first take place in personal pronouns – and in this position, perhaps first when these are used in contrastive focus and reference tracking over longer distances. Next, relative pronouns, predicates, and then attributive modifiers would be affected. An illustration of this process in Irish is given in Frenda (this volume). The endpoint of such a process may be a complete obsolescence of opaque classification, the only remnants of which may be fossilized class morphology on nouns, as in Miraña faunal nouns (see Wurzel 1986 on the repeated decay and renewal of nominal classification).

This section has discussed a number of pieces of evidence for a synchronically observable restriction in the use of opaque classification in certain constructions where transparent classification can freely occur. These include contrastive focus, anaphoric reference after longer stretches of discourse, and agreement on different targets. These restrictions are interpreted as a motivation for a diachronic process of re-classification by which opaque assignment is replaced by transparent assignment to a different class.

5. Differential diffusability of nominal classification

The previous sections discussed the role of semantic generality and semantic opacity in the internal development of nominal classification. This final section briefly considers the role of semantic opacity in contact-induced diachronic changes of nominal classification, in particular the differential diffusability of nominal classification systems of different types (for a morphosyntactic typology of nominal classification, see Aikhenvald 2000; Grinevald 2000). By 'diffusion' I mean the convergence of structures under the influence of contact, usually without the transfer of forms (i.e., loan words or loan morphemes).

Opaque assignment is a characteristic typically associated with particular types of nominal classification systems, namely with strongly grammaticalized systems such as small, obligatory noun class and gender systems. Opaque assignment is much less prevalent in other types of classification systems, i.e., in large and often semi-open classifier systems (in the narrow sense of 'classifier'). For instance, Aikhenvald (2000: 229) claims that "the choice of a classifier in a multiple classifier language is always semantically based," and this distinguishes multiple classifiers, as one kind of system of the type 'classifiers', from noun classes and genders, as another type of classification system.

In recent years, growing evidence has become available that some types of classification systems are diffused more easily than others. In particular, there is now quantitative evidence that classifiers are more prone to diffusion than genders and noun classes (Nichols 2003: 299–303; Wichmann & Holman 2009: 54–55; see also Nichols 1992: 132). These types are defined as clusters of a number of characteristics, but I suggest here that the difference in semantic opacity between these two types may be responsible for this difference in diffusability. This is consistent with 'borrowability' scales (see Wilkins 1996 for a summary) used in language contact research; these predict that elements with a higher degree of grammaticalization are less likely to be borrowed (although these scales usually refer to forms, not structures). Accordingly, classification systems that retain lexical semantic characteristics, i.e., descriptive content and semantically transparent assignment, are more likely to be diffused than systems with semantically opaque assignment, which is more closely associated with grammatical systems. The recruitment of classifier forms from native nouns, a requirement of structural convergence without borrowing of form, may also be facilitated by lexical-like meaning rather than semantically opaque forms.

6. Summary and conclusion

This paper has discussed various diachronic implications of semantic generality and semantic opacity, two key features of nominal classification. First, the pragmatics of semantically general forms in reference tracking provides a possible motivation for developing classification in the first place. Second, the possible emergence of opaque classification was discussed, and an account was suggested of how and why opaque assignment could be replaced by transparent assignment. Finally, the role of opacity (as closely associated with strong grammaticalization) in the diffusability of nominal classification was discussed. These issues show that semantic generality and semantic opacity may play an important role in the diachronic development of nominal classification systems.

Acknowledgments

I am grateful to Søren Wichmann and Bill McGregor as well as two anonymous reviewers for helpful comments on earlier versions of this paper. I am also grateful for funding from the Max Planck Institute for Evolutionary Anthropology's Department of Linguistics headed by Bernard Comrie.

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