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97. Count/mass distinctions across languages
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This article examines the opposition between count and mass in a variety of languages. It starts by an overview of correlates of the count/mass distinction, illustrated by data from three types of languages: languages with morphological number marking, languages with numeral classifiers and languages with neither of these. Despite the differences, the count/mass distinction can be shown to play a role in all three systems. The second part of the paper focuses on the Sanches-Greenberg-Slobin generalization, which states that numeral classifier languages do not have obligatory morphological number marking on nouns. Finally the paper discusses the relation between the count/mass distinction and the lexicon.

1. Outline

The first question to ask when looking at the count/mass distinction from a cross-linguistic point of view is whether this distinction plays a role in all languages, and if so, whether it plays a similar role. Obviously, all languages include means to refer both to individuals (in a broad sense) and to masses. However, it is a matter of debate whether the distinction between count and mass plays a role in the linguistic system of all languages, whether it should be made at a lexical level, and whether all languages are alike in this respect.

In English the count/mass distinction shows up in a number of contexts. Count nouns have a singular and a plural form while mass nouns cannot be pluralized unless they shift to a count interpretation. Numerals and certain other quantity expressions (*several*, *many*) can only be used with plural nouns, while others need a singular count noun (*each*, *a*) or a mass noun (*a bit*). If a numeral combines with a mass term, one has to add a measure word, as in *two glasses of wine*. This strategy is similar to the way numerals combine with all nouns in so-called numeral classifier languages such as Mandarin Chinese. In Mandarin, the use of the numeral forces the presence of a so-called numeral classifier, that is, an expression that indicates a unit of counting or a measure:

(1) a. sān   běn   shū   [Mandarin]
         three CL^{volume} book
     b. liǎng jìn   mǐ
         two   CL^{kilo} rice

Yet another type of strategy can be found in Tagalog (Austronesian, Philippines, Schachter & Otanes 1972). This language lacks number morphology, on a par with Mandarin, but the use of a numeral does not trigger insertion of a classifier. A general overview of the main correlates of the count/mass distinction in these three types of languages will be given in section 2.

According to Greenberg (1972/77: 286) languages that make use of numeral classifiers in their "basic mode of forming quantitative expressions" never have compulsory number marking on the noun (see also Sanches & Slobin 1973). It is important to realize that the implication goes only one way, as there are languages that have neither morphological number marking nor numeral classifiers, such as Tagalog. The Sanches-Greenberg-Slobin generalization and the relation between number and numeral classifiers will be the topic of section 3.

Section 4 focuses on the relation between the count/mass distinction and the lexicon. A central issue is the status of nouns such as *furniture*, which are in many respects similar to nouns that may be argued to have a "count" interpretation in numeral classifier languages.

2. Correlates of the count/mass distinction
2.1 Number morphology and the interpretation of count and mass terms

In many languages, including English, number marking is an important correlate of the count/mass distinction. For count expressions, both a singular and a plural can be formed, and sometimes also a dual or other number categories (trial, paucal). Mass terms may take number morphology only if they receive a count interpretation (see also section 4.1 below). For example, a noun like *gold* can be turned into the plural form *golds*, but then it gets a count interpretation such as 'types of gold' or 'gold medals'. Morphological number marking on the noun is only one of the many ways of marking plural. In several languages clitics are used, or number is morphologically marked on a determiner rather than on the noun (see Corbett 2000, Dryer 2005).

It has often been shown that number marking in English does not exactly correlate with mass and count concepts (see Pelletier & Schubert 1989). There are nouns with a count interpretation that are morphologically mass in the sense that they do not have a singular and a plural form. Examples are *furniture* and *cattle* in English (note that the noun *cattle* is used in some varieties of English as an invariable count noun such as *sheep* or *fish*). These nouns will be called collective mass nouns (cf. Krifka 1991). Plurals and mass nouns have similar semantic properties (cf. article 48, *Mass nouns and plurals*). More in particular, they both have the property of cumulative reference. As argued by Quine (1960), if two items can be called *water*, the item they form when put together can be called *water* as well. Link (1983: 303) adds to this that the same is true for bare plurals, as illustrated by the following sentence: "If the animals in this camp are horses, and the animals in that camp are horses, then the animals in both camps are horses".

Singulars lack cumulative reference. The plural object formed of one teapot and another teapot should be called "teapots", not "a teapot". This can be accounted for in a model where singulars denote sets of atomic individuals, while plurals denote sets of individuals plus all possible sums of these individuals and mass nouns denote all possible sums of substance (cf. Link 1983, Krifka 1986, 1991, article 48 *Mass nouns and plurals*).

Even though mass nouns and plurals share the property of cumulative reference, it has been argued by a number of authors that they differ from each other with respect to their minimal parts. In the case of count nouns, it is in principle clear what units we are talking about (but see Pelletier & Schubert 1989: 342, Rothstein 2010, Nicolas 2004). Mass nouns, on the other hand, have been said to refer homogeneously. Homogeneous reference is defined as the combination of cumulative and divisive reference. Divisivity is the downward counterpart of cumulativity, and implies the absence of minimal parts: given a quantity of water, one can take a subpart of it, and that subpart will be water as well. Quine (1960) already pointed out that the concept

of divisivity is problematic: there are parts of water that are too small to count as water, and this is even more clearly so in the case of furniture. Authors who claim that mass nouns have homogeneous reference usually make a difference between linguistic properties of meaning and the real world: homogeneity is not a property of the substance water, but rather of the linguistic representation of water. According to Bunt (1985: 46) mass nouns do not single out any particular parts and as such do not make any commitments concerning the existence of minimal parts. In the same spirit, Lønning (1987: 8) claims that "it is not critical if mass terms really refer *homogeneously* […]. Rather what is of importance is whether they behave as if they did and what it means to behave in such a way."

The claim of homogeneous reference has been challenged by Chierchia (1998a,b), who does take the real world properties of nouns such as *furniture* into account in his linguistic model. Chierchia argues that all mass nouns correspond to structures that have minimal parts, even though these minimal parts may be more or less vague. In this respect mass nouns are similar to plurals, which explains the existence of pairs such as *footwear* and *shoes*.

Chierchia argues that languages such as Mandarin lack true singulars: all nouns are mass nouns and as such they trigger insertion of a numeral classifier. As plural formation depends on the presence of nouns with a singular denotation and cannot apply to mass nouns, the language is predicted not to have plurals (for an extensive discussion of Chierchia's proposal and of the relation between kind denotations, the occurrence of bare argument nouns and numeral classifiers cf. article 45, *Bare Noun Phrases*, article 47, *Genericity* and article 96, *Semantic Universals and Typology*). In reaction to Chierchia's claims, it has been pointed out that some languages have plural count nouns even though they seem to lack real singulars. Brazilian Portuguese *criança* 'child/children' formally alternates with a plural form (*crianças* 'children'), but its meaning is number neutral rather than singular, that is, the use of this form does not imply singularity, but is neutral with respect to the singular/plural opposition. Within Chierchia's framework the number neutral interpretation is identical to a mass interpretation. Given that the number neutral nouns do not have singular reference, they would be predicted not to pluralize, and to behave like mass nouns, contrary to fact (see Munn & Schmidt 2005 and article 45, *Bare noun phrases*).

2.2 Count environments

In certain environments count interpretations are forced. This is particularly clear for numerals, even though other expressions may impose similar requirements (see section 2.3). This section discusses three ways in which nouns can adapt to the presence of a numeral. Section 2.2.1 focuses on English and other languages in which numerals trigger the presence of number morphology. Section 2.2.2 discusses numeral classifiers. Finally, section 2.2.3 considers a system in which the numeral combines with number neutral nouns without any overt marking of countability.

2.2.1 Morphological number marking

In English, numerals typically combine with plural count nouns or, in the case of *one* with a singular count noun (e.g. *two books*, *one book*). If a mass term is used in this type of context, it either has to undergo a shift to a count interpretation and behave like a count noun (*two wines*), or a special structure has to be used that includes an expression indicating a unit of counting or a measure. This expression is usually a noun with number morphology, as in *two liters of water* or *three pots of honey*. The nouns that may be used in this position form an open class of items indicating for instance a conventional measure (*a kilo of sugar*, *a liter of wine*), containers or

contained quantity (*a cup of coffee*, *a box of books*), shape (*a slice of bread*), collection (*a bunch of flowers*) and arrangement (*a pile of wood*) (cf. Allan 1977, Lehrer 1986). Following Grinevald (2005), these expressions will be referred to as measure terms. Measure terms are in many respects similar to classifiers, but do not form part of a general system of classification.

In English, where count and mass nouns are easily distinguished from one another by plural marking, measure terms are usually compatible with both mass nouns and plurals. In case they combine with a plural, they have scope over the pluralities: in *two boxes of books*, each box contains of a plurality of books. Some measure terms are even restricted to plurals; examples are *bunch*, *crowd* and *flock*.

There are no measure terms that combine with singular nouns in English. It will be argued below that this results from a cross-linguistic generalization that applies to both measure terms and numeral classifiers: all of these expressions combine with nouns that have cumulative reference. As English singulars lack cumulative reference, they cannot be used in this type of context. Note that measure terms differ in this respect from *type* and *kind*, as in *two types of car* (cf. article 47, *Genericity*). Languages vary in the type of structures they use for measure terms (see for instance Koptjevskaja-Tamm 2001, Rothstein 2009). Even within Germanic two different types can be distinguished. Whereas English uses a pseudo-partitive construction (*two pots of honey*), Dutch and German use structures without a genitive preposition (*twee potten honing* lit. 'two pots honey'). Moreover, Dutch and German do not always require the presence of the plural morpheme on the measure term, as in *twee liter wijn* lit. 'two liter wine'. However, only a small number of measure terms can used this way. In general non classifier languages tend to treat their measure terms as ordinary count nouns in the sense that they need to be marked for number.

2.2.2 Numeral classifiers

As already illustrated in (1), numerals in languages such as Mandarin trigger the insertion of a so-called numeral classifier. Numeral classifiers can be either mensural or sortal. Mensural classifiers are similar to the measure terms discussed in the previous section (Allan 1977, Grinevald 2004). Both Grinevald and Allan insist on the fact that measure terms and mensural classifiers should be distinguished from one another. Mensural classifiers are part of a larger system of classification as they co-exist with sortal classifiers. One can add to this that some classifier languages only have sortal classifiers. In the numeral classifier language Mokilese (Austronesian, Micronesia, Harrison 1976:106), measure words behave as count nouns, and need classification themselves: *jilu-w poaun in koahpihen* lit. 'three-CL[general] pound of coffee'/ 'three pounds of coffee' (morpheme boundary added, cf. (4) below).

Sortal classifiers specify units "in terms of which the referent of the head noun can be counted" (Grinevald 2005: 1020). Sortal classifiers may indicate shape (long object, round object, flat object), an essential property (woman, man, animal, plant) or function (drinkable, for transportation) (see also Allan 1977, and Aikhenvald 2000). Whereas mensural classifiers usually constitute a rather large set, the number of sortal classifiers varies from language to language. In Totzil (Mayan, Mexico, Grinevald 2004), several hundred numeral classifiers have been identified, only eight of which are sortal, while Mandarin has several dozen sortal classifiers (Li & Thompson 1981). Even though it is clear that English does not have sortal classifiers, expressions such as *head* and *piece* in *two head of cattle* and *three pieces of furniture* come rather close (cf. Greenberg 1972/77, Allan 1977: 293).

According to Grinevald (2005), sortal classifiers indicate a unit of counting while appearing to be semantically redundant in the sense that they specify an inherent

characteristic of the noun they modify. In many classifier languages there is one classifier that functions as a general classifier, which is semantically bleached and tends to combine with a large set of nouns in the language. An example is Mandarin *ge*, the classifier normally used with the noun *rén* 'person', which tends to replace more specialized ones (Li & Thompson 1981). There are also many languages in which the sortal classifier may be left out without a change in meaning (see for instance Jacob 1965 and Adams 1991 on Khmer, an Austro-Asiatic language spoken in Cambodia).

It is usually predictable which sortal classifier should be used, even though Becker (1975) shows that creative language users such as writers may use the same noun with different (sortal) classifiers, thus emphasizing different aspects of the meaning of the noun. Similarly, classifiers may trigger different meanings of a polysemous noun (cf. Zhang 2007).

Cheng & Sybesma (1998, 1999) show that syntactic structures containing sortal classifiers ("count-classifiers") differ from those containing mensural classifiers ("massifiers" or mass-classifiers in their terminology). Sortal classifiers, contrary to mensural ones, do not allow for the presence of *de*, a marker typically found at internal phrasal boundaries inside a noun phrase, and they cannot be modified by adjectives. This is illustrated for the sortal classifier *zhī* 'CL^{branch}' and the mensural classifier *xiāng* 'box' in (2):

(2) a. sān   (*xiǎo) zhī   (*de)   bǐ   [Mandarin]
         three   small CL^{branch} DE   pen
         'three pens'
     b. liǎng   (xiǎo) xiāng (de)   shū
         two   small   box   DE   book
         'two boxes of books'

Cheng & Sybesma argue that "massifiers" (mensural classifiers) are ordinary nouns that under specific conditions may fill a classifier slot.

Classifiers may have different relations to the noun and to the numeral (cf. Greenberg 1972/77, Allan 1977 and Aikhenvald 2000). In many languages, they are fused with the numeral (e.g. Nivkh (Nivkh, Siberia, Gruzdeva 1998), Japanese (Downing 1996) and Mokilese (Austronesian, Micronesia, Harrison 1976)). In other languages (e.g. Mandarin) they constitute a separate lexeme between the noun and the numeral and have been argued to form a constituent with the noun phrase first (cf. Cheng & Sybesma 1999). This pattern occurs in e.g. Thai (Tai-Kadai, Thailand), Tashkent Uzbek (Altaic, Uzbekistan) and Assamese (Indo-European, India) (cf. Aikhenvald 2000). The classifier and the numeral are always adjacent. It is possible, however, that the classifier forms a prosodic unit with the noun rather than with the numeral, as shown by Ikoro (1996) for Kana (Niger-Congo, Nigeria), but this is the exception rather than the rule (Aikhenvald 2000).

A classified noun is usually number neutral. When used as a bare noun, Mandarin *shū* 'book(s)' may be used to refer to one or several books (cf. among many others Krifka 1995, Rullmann & You 2006). The next section discusses a type of language with number neutral nouns that does not make use of numeral classifiers.

2.2.3 Number neutral nouns without numeral classifiers
In many languages of the world numerals combine directly with number neutral nouns (cf. Gill 2005). Even though this type of strategy is rarely taken into account in the literature on the count/mass distinction, the difference between count and mass does

play a role in this type of languages as well (cf. Wilhelm 2008, who reached similar conclusions to the ones presented here on the basis of facts from Dëne Sųłiné, Athapaskan, Canada). The following examples from Tagalog (Austronesian, Philippines, Schachter & Otanes 1972: 143, 208) illustrate the use of numerals with count and mass nouns. In the latter case a measure term is inserted (a ganta corresponds to three liters):

(3) a.   dalawang   mansanas   [Tagalog]
          two+LINKER   apple
          'two apples'
     b.   dalawang   salop na   bigas
          two+LINKER   ganta LINKER   rice
          'two gantas of rice'

Schachter & Otanes indicate that Tagalog nouns are number neutral, even though in many contexts the plural marker *mga* may be added (interestingly not with numerals, as they note on page 142). However, they insist on the fact that there is a count/mass distinction in the language: "Tagalog makes a distinction between pluralizable and unpluralizable nouns that is like a distinction made in English. [...] In general, Tagalog count nouns correspond to English count nouns and refer to items that are perceived as distinct units: e.g., *bahay* 'house', *baro* 'dress', *bata* 'child'." (Schachter & Otanes 1972: 112) As for mass nouns, Tagalog and English are similar as well, even though nouns such as *furniture* tend to be count nouns in Tagalog. One might speculate that collective mass nouns, which have a count meaning but the morphology of a mass noun, typically occur in languages with an obligatory system of singular/plural marking, as the lack of number marking distinguishes them from other nouns with count interpretations (cf. section 4 below).

2.3   Selectional properties of determiners
Numerals are not the only expressions that may trigger number morphology on nouns or insertion of a classifier. Quite in general, determiners impose restrictions on the nouns they combine with (the term determiner will be used in a very broad sense for quantifying expressions as well as definite and indefinite determiners). In English, *several*, *few*, *many* and *different* only combine with plural nouns on a par with the numerals above *one*, while *a*, *every* and the numeral *one* select singular nouns. Interestingly, there do not seem to be any determiners that combine with all count nouns (singulars and plurals) and not with mass nouns. At least in English, determiners that combine with both singulars and plurals also combine with mass nouns (*some*, *any*, *the*, *no*), and as such they are not sensitive to the count/mass distinction.
A very large class of determiners combines with mass nouns and plurals. This class includes *a lot*, *more*, *less*. Most of these determiners can also be used as adverbs indicating the quantity corresponding to an event, as in *John slept a lot*. These "adverbial" determiners have been claimed to be sensitive to the property of cumulative reference (cf. Doetjes 1997, 2004). A small class of determiners is restricted to mass nouns, and these usually allow for adverbial use as well (*a bit*, *much*, *little*). In English these expressions are in complementary distribution with a plural selecting determiner (*much – many*, *little – few*, *a little/ a bit – a few*). One way of looking at these "mass only" determiners is to assume that their incompatibility with plurals is due to blocking by the plural selecting alternative.

Mandarin distinguishes between determiners that force insertion of a classifier, determiners that allow for the optional presence of a classifier and determiners that disallow classifiers. Not only numerals, but also demonstratives and certain quantificational determiners (e.g. *jǐ* 'how many', 'a few') require the presence of a numeral classifier. With certain other determiners the classifier is either absent or optional depending on the dialect (cf. *hěn duō (%wǎn) tāng* 'much soup' or 'many cups of soup', *hěn duō (%běn) shū* 'many/a lot of books'). Mandarin speakers from the North tend not to allow for a classifier at all (sortal or mensural), while speakers from the South optionally insert a classifier. Furthermore, some speakers reject the use of a sortal classifier (*běn*) while accepting the use of container words such as *wǎn* in their container reading, but not when used as a measure. Despite the dialectal differences, these determiners are similar to *a lot* and *more* in English in the sense that they combine directly with mass nouns and count nouns, and as such can be said to be insensitive to the count/mass distinction. Interestingly, Mandarin also has a counterpart of *a bit*. The form *yī diǎnr* 'a little' never allows for insertion of a classifier, and is typically used with nouns that have a mass or an abstract denotation (Iljic 1994). The form alternates with *jǐ* 'a few', which always triggers insertion of a classifier.

As for Tagalog, Schachter and Otanes (1972) state that expressions such as the cardinal numerals, *iilan* 'only a few', *ilan* 'a few' and *hindi iilan* 'not a few, quite a few' are used with count nouns, while for instance *kaunti* 'a little' and *hindi kaunti* 'not a little, quite a lot' typically combine with mass nouns. Other expressions, such as *marami* 'a lot', are insensitive to the count/mass distinction, and combine with count nouns and mass nouns alike.

As shown in table 1, determiners in all three languages may be sensitive to the count/mass distinction.

	count	mass	indifferent
English	*one* (singular noun), *a few* (plural noun)	*a little*	*a lot*
Mandarin	*yī* 'one', *jǐ* 'a few' (CL + number neutral noun)	*yī diǎnr* 'a little'	*hěn duō* 'a lot'
Tagalog	*isa* 'one', *ilan* 'a few' (number neutral noun)	*kaunti* 'a little'	*marami* 'a lot'

Table 1: Selectional properties of determiners (examples)

3. The Sanches-Greenberg-Slobin generalization
3.1 Number and classifiers

An important universal associated with the count/mass distinction concerns the relation between number and classifiers (for universals in general, cf. article 13, *Methods in cross-linguistic semantics* and article 96, *Semantic Universals and Typology*). In 1972 Greenberg postulates that languages without compulsory number marking on the noun may have obligatory use of numeral classifiers, referring to an unpublished paper by Sanches from 1971, later published as Sanches & Slobin (1973). Sanches originally states the generalization as follows (Greenberg 1972/77: 286): "If a language includes in its basic mode of forming quantitative expressions numeral classifiers, then […] it will not have obligatory marking of the plural on nouns." Moreover, Sanches claims that classified nouns are normally singulars. According to Greenberg, it rather seems to be the case that the classified noun is normally not marked for number. In what follows it will become clear that Greenberg's version of the observation is on the right track: classifiers are used predominantly with number neutral nouns. Greenberg argues that the loss of number

marking on nouns in a language may lead to the emergence of a numeral classifier system, in which case the classifier construction is modelled after structures containing a measure term.

The Sanches-Greenberg-Slobin generalization seems to be quite robust. When examining this universal, two aspects of the generalization should be kept in mind. In the first place, the generalization is implicational and only holds one way. Thus, it is not the case that languages without obligatory number marking on the noun will have a general system of numeral classifiers. The examples of Tagalog in section 2.2.3 illustrate this point. In the second place, the generalization speaks about "marking of plural on nouns". As will become clear below, this should be taken literally in the sense of morphological number marking. Other types of number marking do not count (e.g. number morphology on a demonstrative or number marking by means of an independent morpheme cf. Dryer 2005). Moreover, the morphological number marking should be compulsory. Yucatec (Mayan, Mexico; Allan 1977: 294) is an example of a numeral classifier language with optional number morphology on the noun, which may be used even in the presence a classifier: *oš tul maak(oob)* lit. 'three $CL^{animate}$ person(s)'/ 'three persons'.

In the literature, several counter-examples to the Sanches-Greenberg-Slobin generalization have been mentioned, including for instance Nivkh (Nivkh, Siberia), Ejagham (Benue-Congo, Nigeria/ Cameroon) and Southern Dravidian languages (India) (cf. Aikhenvald 2000). However, none of them constitutes a clear case of a language with obligatory number marking on the noun and a general system of numeral classifiers. Nivkh does not have compulsory number marking (Gruzdeva 1998: 17) while Ejagham is not a numeral classifier language (see section 2.4 below). As for Southern Dravidian Languages, Haspelmath et al. (2005) provide information on a number of languages of this genus, but do not classify any of them as a numeral classifier language with obligatory morphological number. Further research, providing detailed information about the relevant facts in potentially problematic languages, is necessary. Given the accessible data so far, it seems that if counter-examples exist, they are typologically extremely rare.

Several types of languages are of special interest for gaining a better understanding of the generalization. Section 3.2 discusses languages that have both obligatory number marking and obligatory use of numeral classifiers. Section 3.3 investigates optional use of classifiers in languages with obligatory number marking on nouns. In section 3.4 a mixed system will be discussed in which classifiers and number seem to co-occur. Section 3.5 concludes and reconsiders the Sanches-Greenberg-Slobin generalization in the light of the presented data.

3.2.   Obligatory plural marking and obligatory classifiers

An example of a language with obligatory number marking and obligatory use of numeral classifiers is Mokilese (Austronesian, Micronesia; Harrison 1976; in the cited examples relevant morpheme boundaries have been added). Mokilese makes use of a limited set of classifiers. Singular indefinites are marked by suffixation of the classifier. The general classifier *-w* is preceded by the numeral *oa-* 'one', suggesting that this numeral may have been dropped in cases where it is absent: *pukk-oaw* (*puk + oa-w*) lit. 'book-one-$CL^{general}$'/ 'a book', *koaul-pas* lit. 'song-$CL^{long\ object}$'/ 'a song'. A plural indefinite is marked by a separate morpheme *-pwi*, which alternates with the classifiers (*woal-pwi* lit. 'man-PL'/ '(some) men'). In case a numeral is used, the numeral fuses with the appropriate classifier and the use of *-pwi* is excluded. This shows that *-pwi* is more similar to a plural indefinite determiner such as French *des* in *des livres* 'books', than to the English plural suffix *-s*.

(4)   a.   mwumw jilu-w/   jil-men   [Mokilese]
             fish   three-$\text{CL}^{general}$ three-$\text{CL}^{animate}$
             'three fish'
    b.   suhkoa rah-pas
             tree   two-$\text{CL}^{long\ object}$
             'two trees'

The pattern found in Mokilese for indefinites is similar to the pattern found in Mandarin. The Mandarin numeral *yī* 'one' may be left out in direct object position, yielding a sequence of a classifier and a noun with a singular indefinite interpretation (cf. Cheng & Sybesma 1999). Mokilese *-pwi* resembles the element *xīe* in Mandarin, which is sometimes called a 'plural classifier' (but see Iljic 1994 for differences between *xīe* and classifiers). *Xīe* can be preceded by the numeral *yī* 'one' but it is incompatible with all other numerals: *(yī)/ *sān xīe rén/bǐ* lit. '(one)/*three PL person/pen'/ 'some persons/pens'. This property is reminiscent of elements such as *few* in English, that do combine with the indefinite determiner *a* but not with numerals (*a few pens* vs. *two few(s) pens*).

However, Mokilese differs significantly from Mandarin with regard to the way in which demonstratives are used. Whereas Mandarin demonstratives trigger insertion of a classifier, demonstratives in Mokilese show up as suffixes and are obligatorily marked for number, as shown in *woall-o* (*woal* + *-o*) lit. 'man-that'/ 'that man', *woall-ok* (*woal* + *-ok*) lit. 'man-those'/ 'those men'. Thus, the singular/plural opposition in this language is marked obligatorily, but it is marked on the demonstrative rather than on the noun. Consequently, the Mokilese data are in accordance with the Sanches-Greenberg-Slobin generalization.

The Mokilese data illustrate that morphological number on a noun differs from morphological number marking on a demonstrative. One could argue that Mokilese nouns are always number neutral, as in the case of Mandarin. Number marking plays a role at a different level: the demonstrative determiner has a singular and a plural form, not the noun. The presence of number marking on the demonstrative should not be taken to be a reflection of agreement with an invisible category for singular or plural on the noun, as the comparison with other classifier languages strongly suggests that Mokilese bare nouns are semantically and morphologically number neutral.

3.3   Optional classifiers and obligatory number

The Sanches-Greenberg-Slobin generalization is about languages that make obligatory use of numeral classifiers. In order to find out why languages make use of classifiers, languages with optional use of numeral classifiers are also an important object of study. Optional classifiers are very frequent cross-linguistically. Haspelmath et al. (2005) list almost as many languages with optional classifiers as languages with obligatory ones. Some languages with optional classifiers have a set of sortal classifiers and thus resemble Mandarin and Mokilese (e.g. Khmer, Austro-Asiatic, Cambodia; Jacob 1965). Other languages have only one optional sortal classifier, which is sometimes also called an enumerator (e.g. Hausa, Chadic, Nigeria; Newman 2000).

This section focuses on languages with optional classifiers that also have morphological number marking which in some contexts is obligatorily present. The first language that will be considered is Armenian (Indo-European, Turkey/ Armenia; Borer 2005, Bale & Khanjian 2008, Minassian 1981). Borer (2005: 94), citing

Michelle Siegler (p.c.), gives the paradigm in (5) for Western Armenian (Turkey). Eastern Armenian (Armenia) is similar in the relevant respects.

(5) a. Yergu (had) hovanoc uni-m   [Western Armenian]
         two   (CL) umbrella have-1SG
     b. Yergu (*had) hovanoc-ner uni-m
         two   (*CL) umbrella-s   have-1SG

The data in (5) show that the numeral combines with a non-plural noun, with a plural noun or with a classifier followed by a non-plural noun, while plural marking on the noun following the classifier is excluded. Note that even though the use of the plural is optional with numerals and in a number of other contexts, it is obligatory in non generic noun phrases containing the definite article (cf. Minassian, 1980: 81–82 for Eastern Armenian). However, Bale & Khanjian (2008) show that the non-plural form is not a singular but rather a number neutral noun, which means that it denotes an atomic join semi-lattice rather than a set of atoms. This is in accordance with the observation above that classifiers do not combine with real singulars, which lack cumulative reference. The data in (5) reflect the patterns discussed for Mandarin, Tagalog and English above. (5a) corresponds to the patterns found in Mandarin (classifier plus number neutral noun) and Tagalog (number neutral noun), while (5b) is similar to the pattern found in English.

Borer accounts for the data in (5) in a syntactic way. In her view, a count interpretation has to be syntactically licensed by the presence of a so-called "divider". Both classifiers and number may act as dividers, but as there is only one syntactic slot available, stacking of dividers is excluded, ruling out the combination of a classifier and a plural. In order to account for the optionality of the classifier in (5a), Borer assumes that numerals in this language may function as dividers (Borer 2005: 117-118). Contrary to Borer, Bale & Khanjian (2008) offer a semantic explanation for the impossibility of the use of a classifier (5b). They argue that plurals in this language are real plurals in the sense that their denotation excludes the atoms (cf. article 48, *Mass nouns and plurals*). Under the assumption that the classifier needs atoms in the denotation of the noun it combines with, it is incompatible with the plural form.

From the perspective of the Sanches-Greenberg-Slobin generalization, the Armenian facts are particularly interesting, as they show that (optional) classifiers are not impossible in a system in which number marking is in some cases obligatorily marked on the noun. Languages with obligatory plural marking tend to lack number neutral nouns, but in some linguistic systems the two may co-occur. Sortal classifiers are typically found with nouns that are neither singular nor plural, as indicated by Greenberg (cf. section 3.1).

However, it is not the case that combinations of classifiers and plural nouns are completely excluded, contrary to the predictions of Borer. There are also languages that present all four possibilities given in (5). An example of such a language is Hausa (Afro-Asiatic, Niger, Nigeria; Zimmermann 2008), as illustrated in *kujèeraa/kùjèeruu (gùdaa) huɗu* lit. 'chair.SG/PL (CL) four'/ 'four chairs'. According to Zimmermann, various facts indicate that Hausa non-plural nouns are number neutral rather than singular. Moreover, he argues that the plural in Hausa does not include the atoms. If this is right, the pattern is not only unexpected under Borer's syntactic account of the Armenian data in (5), but also under the semantic analysis of Bale & Khanjian.

The mixed properties of Armenian and Hausa seem to correlate with the existence of number neutral nouns in these languages. Hausa is of special interest, as this language uses the classifier also with plural nouns (cf. also the Yucatec example in section 3.1).

It is unclear at this point under what conditions plural nouns can co-occur with sortal classifiers.

3.4 Mixed systems

It is clear from the preceding discussion that the distinction between languages such as English, Mandarin and Tagalog illustrated in section 2 is a very rough one, which does not account for the many existing intermediate cases. The patterns in Armenian and Hausa discussed in the previous section illustrate the fact that a numeral can be used in various ways with the same noun in a single language. There are also mixed systems where part of the lexicon has a singular/plural opposition, whereas a large class of other nouns with count interpretations need insertion of an expression that resembles a sortal classifier in order to be combined with a numeral.

This is the case in Ejagham (Niger-Congo, Cameroon, Nigeria; Watters 1981), which is taken to be a numeral classifier language by for instance Aikhenvald (2000). Ejagham uses a noun class system that encodes, among other things, the opposition between singular and plural, resulting in obligatory plural marking on the nouns that fall in these classes. Numerals agree in noun class with the noun they modify, as in *Ǹ-díg mɔ́-d* lit. '3-rope 3-one'/'one rope' and *à-ríg á-sá* lit. '6-rope 6-three'/'three ropes', where 3 and 6 refer to a singular and a corresponding plural noun class respectively (Watters 1981: 469, 471).

The language also has quite a large class of nouns with count interpretations that are members of a single noun class, which means that they do not introduce a singular-plural opposition. When these nouns are combined with numerals, a unit counter is used, which Watters calls a classifier (Watters 1981: 309-313). Many words for fruits, roots, trees, plants and vegetables are in this class, while most of their English counterparts are marked for number. The system strongly resembles a numeral classifier system. Watters distinguishes five different "classifiers", some of which can also be used as independent nouns. However, as noted by Aikhenvald (2000), the "classifiers" in this language are in a plural or a singular noun class, and the numeral agrees with the classifier in noun class. This is illustrated by (6). The classifier used in this example belongs to noun class 5 if it is singular and to noun class 9 if it is plural; GN is a (tonal) genitive linker:

(6) a. ɛ̀-rɔ́m   ´   í-čɔ́kùd   jɔ́-d   [Ejagham]
         5-CL^fruit   GN   19-orange   5-one
         'one orange'

     b. Ǹ-dɔ́m   `   í- čɔ́kùd   ɛ́-bá'ɛ́
         9-CL^fruit   GN   19-orange   9-two
         'two oranges'

The expression of singular and plural on the "classifiers" shows that they behave like ordinary count nouns in the language, and as such should not be considered to be sortal classifiers but rather count nouns that function as unit counters, on a par with *piece* in English (cf. the discussion in section 2.2 and Greenberg 1972/77). Ejagham thus seems to have a large number of collective mass nouns, that is, nouns that are similar to *furniture* in English in the sense that they do not have a singular and a plural form, even though from a semantic point of view they have a count interpretation. Ikoro (1994) argues that the unit counters used for part of the lexicon in Ejagham and the numeral classifiers generally used in the numeral classifier language Kana (Niger-Congo, Nigeria; Ikoro 1994) have a common origin, suggesting that collective mass

nouns may well have played an important role in the genesis of the numeral classifier system of Kana (cf. Greenberg 1972/77).

3.5   Consequences for the Sanches-Greenberg-Slobin generalization

In the preceding sections a number of languages have been looked at in view of the Sanches-Greenberg-Slobin generalization, which states that numeral classifier languages do not have obligatory marking of the plural on nouns. It has been argued in the preceding sections that the presence of number neutral nouns in a language seems to be the crucial factor for the presence of sortal classifiers, as illustrated in several ways.

In the first place, the generalization itself insists on the compulsory nature of number morphology: languages with optional number marking on the noun may have numeral classifiers (e.g. Yucatec, Mayan, Mexico; Allan 1977). If number is an optional category on the noun, the non-plural noun should have a number neutral denotation and cannot be a true singular, as it can also be used to denote pluralities.

In the second place, languages with number marking that is not realized as a morphological affix on the noun may have numeral classifiers. This possibility was illustrated on the basis of the numeral classifier language Mokilese (Austronesian, Micronesia; Harrison 1976), which marks number obligatorily on the demonstrative. At the level of the noun, number does not seem to play a role, and it makes sense to assume that bare nouns in this language are number neutral.

In the third place, a language may have obligatory number marking on nouns in certain contexts, while also having number neutral nouns. This seems to be the case in Armenian (Indo-European, Turkey/Armenia, Borer 2005, Bale & Khanjian 2008, Minassian 1980). The language has number neutral nouns, and optionally inserts a sortal classifier between a numeral and a number neutral noun.

The way the Sanches-Greenberg-Slobin generalization is formulated does not make reference to number neutral nouns, but rather to obligatory marking of plural on nouns. The case of Armenian shows that in some languages number neutral nouns may occur in a system with obligatory plural morphology on nouns. What does not seem to exist are languages with general use of numeral classifiers (i.e. sortal classifiers may or must occur with all nouns that have a count interpretation) and a systematic morphological singular-plural opposition, excluding number neutrality. This distinguishes between languages such as English, which has true singulars as well as obligatory plural marking on nouns, and languages such as Armenian where plural nouns alternate with number neutral forms rather than with (semantic) singulars.

Interestingly, one could say that number neutrality also plays a role in systems with a strict singular-plural opposition. In English *furniture*, *cattle* and *footwear* arguably have a number neutral interpretation, and the same is true for a large class of nouns in Ejagham (Niger-Congo, Cameroon/ Nigeria; Watters 1981). In order to use numerals with these nouns, one has to insert a count noun that functions as a unit counter.

At this point, a number of questions need further investigation. First, more languages need to be studied in order to see whether there are systematic differences between languages with obligatory use of numeral classifiers and languages with optional numeral classifiers. For instance, one may wonder whether there are obligatory numeral classifier languages with one single numeral classifier (cf. the systems of optional classifier insertion in Armenian and Hausa).

A second issue concerns the possibility of having numeral classifiers with nouns that are morphologically plural, as in Yucatec (section 3.1) and Hausa (section 3.3). Plural marking in combination with a classifier is the exception rather than the rule, and it is

not clear at this point whether this pattern ever occurs in a language without number neutral nouns. More languages need to be studied in order to gain insight into this issue.

A further question that needs to be answered is why the generalization exists. Even though some proposals have been made in the literature, this is still an open question. In the syntactic literature, it has been argued that both classifiers and number may have a similar function in a language. As already indicated in section 3.3 above, Borer assumes that classifiers and number morphology function as so-called dividers. She claims that count interpretations need to be syntactically licensed by the presence of a divider. As there is a single syntactic slot for the divider, the classifier and number morphology compete for the same syntactic position, which predicts that they are mutually exclusive. Similarly, Doetjes (1997) argues that both classifiers and number morphology function as grammatical markers of countability. Numerals need the presence of a grammatical element that signals the presence of minimal parts in the denotation of the noun. In this view, classifiers and number morphology have the same syntactic function.

From a semantic point of view, plural morphology and classifiers do not seem to have the same function. If it is true that the classified noun is number neutral, the denotation of the number neutral noun in a numeral classifier language is very close if not identical to that of a plural noun in a language with a systematic distinction between singular and plural (cf. article 48, *Mass nouns and plurals* for arguments in favor of including the atoms in the denotation of plural nouns in English). Classifiers have been argued to be "singularlizers", in the sense that they map an atomic semi-lattice into a set of atoms (Chierchia 1998b: 347, Cheng & Sybesma 1999: 521). This does not predict an alternation between classified nouns and plural nouns, unless one were to assign singular interpretation to plurals in the context of numerals, in which case the plural marker would reflect agreement rather than semantic plurality (cf. Ionin & Matushansky 2006, who argue in favor of such an approach). If one were to accept such a proposal, it would still not explain why, in the absence of classifiers, languages tend to use plural or number neutral nouns with numerals.

On the other hand, if mass nouns and count nouns have different reference properties, as proposed by Bunt (1985), one could say that numeral classifier languages lack a count-mass distinction: all nouns are mass, and as such, the classifiers are necessary in order to provide a measure or unit for counting. The next section will argue that such a view cannot be maintained. Both numeral classifier languages and languages with obligatory morphological number marking present evidence in favor of the idea that the count/mass distinction plays a role at a lexical level.

4.   Count versus mass in the lexicon

In the literature on the count/mass distinction, a central question is to what extent the correlates of the count/mass distinction have to do with lexical properties of nouns. According to a lexicalist point of view (see among others Gillon 1992), there are count nouns and mass nouns in the lexicon of a language such as English. A different point of view, recently defended by Borer (2005), takes the count structures in syntax to be triggers for a count interpretation of nouns that are lexically mass (see also Sharvy 1978). The reason for the existence of "unitarian expression approaches", as Pelletier & Schubert (1989) call them, is the fact that most nouns can be either mass or count, depending on the context (e.g. *Kim put an apple in the salad* versus *Kim put apple in the salad*).

This section explores the semantic properties of count nouns and mass nouns, or rather, count meanings and mass meanings. Section 4.1 investigates meaning shifts

from mass-to-count and vice versa and section 4.2 comes back to the status of count and mass in the lexicon in languages such as English. Section 4.3 extends the discussion to other types of languages, focusing specifically on numeral classifier languages, as these languages have been claimed not to have a lexical count/mass distinction (cf. Denny 1986, Lucy 1992 among others), while others refute this claim (cf. for instance Cheng & Sybesma 1998, Doetjes 1997).

4.1   Shifts

Nouns that one would like to call "count nouns", can easily be used with a mass interpretation. In order to illustrate this, Pelletier (1975/79) introduces the concept of the "universal grinder", suggested to him by David Lewis:

> "Consider a machine, the "universal grinder". This machine is rather like a meat grinder in that one introduces something into one end, the grinder chops and grinds it up into a homogeneous mass and spews it onto the floor from its other end. […] Now if we put into one end of a meat grinder a steak, and ask what there is on the floor at the other end, the answer is 'There is steak all over the floor' (where steak has a mass sense). […] The reader has doubtless guessed by now the purpose of our universal grinder: Take an object corresponding to any (apparent) count noun [...] (e.g., 'man'), put the object in one end of the grinder, and ask what is on the floor (answer: 'There is man all over the floor').   (Pelletier 1975/79: 6)

Pelletier concludes that basically any noun, provided the right context, may have a mass interpretation.

Nouns that one would like to call "mass nouns" frequently allow for a count interpretation as well. Most if not all mass nouns in English have a "type of" reading which is count. So, *two golds* may mean two types of gold and two *two wines* two types of wine. Bunt (1985: 11) calls this the "universal sorter". Moreover, mass nouns can often be used to refer to a typical object made of the stuff the mass noun normally refers to, or a portion of N-mass. In the case of *gold* this can be for instance a gold medal, as in: *He won two Olympic golds*, while the noun *wine* can be used for a glass of wine.

One might conclude from this that basically all nouns can be used in mass and in count contexts, and that these contexts force a count or a mass interpretation. This in turn begs the question whether we want to have a distinction between mass nouns and count nouns in the first place. Before addressing this question, some more cases of count-to-mass shifts and mass-to-count shifts will be considered (cf. Doetjes 1997, Nicolas 2002).

Going back to Pelletier's universal grinder, it is clear that it grinds physical objects. However, there are also count nouns that refer to abstract objects. These usually do not allow for grinding. Take for instance the noun *aspect*. Can one put an aspect in the grinder? And if there is aspect all over the floor, what does that mean? The same is true for other abstract count nouns such as *characteristic* and measure nouns such as *mile* and *kilometer*.

As for mass-to-count shifts, the type reading and the portion reading seem to be rather common and productive. However, not all languages allow for these readings for all nouns. Take for instance the example of Dutch. In the first place, certain classes of mass nouns lack count readings all together. Dutch does not have a count noun *gold*: *twee gouden 'two golds' being unacceptable. The same is true for other material nouns in Dutch, such as *hout* 'wood'. In the second place, there are nouns that do have a type reading, but lack a portion reading. In that case, the portion reading can usually

be derived by adding the diminutive marker *–tje* (cf. *twee wijnen* lit. 'two wine+PL'/ 'two types of wine' vs. *twee wijntjes* lit. two wine+DIM+PL/ 'two glasses of wine'). Turning to other types of mass-to-count shifts, namely the ones that result in a reading of the kind *object made of N*, it is usually not predictable at all what the meaning of the count noun will be. Take again the English noun *gold*. Even though this word can refer to a gold medal, it is much harder if not impossible to use it in order to refer to a gold necklace.

4.2   The semantics of count nouns and mass nouns
The fact that nouns normally have both count and mass meanings led to question whether it is necessary to assume a distinction between mass nouns and count nouns in the lexicon.

Sharvy (1978) tentatively argues that English might be "like Chinese" and lack count nouns all together in the sense that all nouns need insertion of a classifier. The structure of *two beers* would be one with an empty classifier for *glass*, and the plural morphology on *beer* would originate from the covert classifier. Recently, Borer (2005) makes a similar claim, without assuming the presence of a covert classifier. In her view the presence of count syntax (as realized by number morphology and classifiers) triggers a count reading of a noun phrase: "all nouns are born unspecified for any properties, including count or mass, and [...] as a default, and unless more structure is provided, they will be interpreted as mass" (Borer 2005: 108).

Given the restrictions on the shifts discussed in the previous section, it is far from obvious that the count/mass distinction is absent at the level of the lexicon. In the first place, there are nouns that are always mass or always count. Moreover, when shifts take place, one often has the impression to be able to indicate a direction in which the meaning shifts. Another important question is what kind of object a given noun may refer to. Take the noun *chicken* and assume that this noun is lexically mass. The question is then how to predict what meaning one obtains if this noun is used with count syntax, as in *three chickens*. Why would this not mean, in a relevant context, *three drumsticks*? Under the assumption that the shifts discussed above represent lexical rules, lexical restrictions are expected, both on the possible interpretations of a noun and on the availability of count and mass readings.

The count/mass distinction can be implemented in the lexicon in different ways (cf. Pelletier & Schubert 1989). One could assume that the lexicon contains both a count noun *chicken* and a mass noun *chicken* which are [+count] and [–count] respectively. Alternatively, there might be a single noun with several senses that may introduce criteria for counting or not, but that are not marked syntactically by a feature [± count]. In the latter case, count syntax would force the choice of a sense of a word that introduces a criterion for counting. Mass syntax would be used in the absence of such a criterion.

A central point of discussion in this context is the status of collective mass nouns. As often noted in the literature on the mass count distinction, *shoes* and *footwear*, *coins* and *change* have very similar meanings. Given that collective nouns seem to provide a criterion for counting, what prevents them from being used in a count environment? In the spirit of Bunt and Lønning one could say that even though *footwear* and *shoes* are nouns that can be used to refer to the same objects, *footwear* represents this meaning as if it has homogeneous reference, while *shoes* provides a linguistically relevant criterion for counting.

However, there are reasons to assume that the nouns *footwear* and *furniture* provide a criterion for counting which is linguistically relevant (see for instance Chierchia 1998a,b, Doetjes 1997, Nicolas 2002, Chierchia 2010). For instance, *a pair of*

footwear and *a pair of shoes* can be opposed to #*a pair of water*. The interpretation of this type of nouns in the context of degree words, and in particular comparative *more*, is even more telling. As shown in (7), the evaluation of the quantity of objects indicated by *more* depends on whether *more* is used with a mass noun or a plural (see Gathercole 1985, Doetjes 1997, Barner & Snedeker 2005):

(7)   Peter ate more chocolates than John   ↮
          Peter ate more chocolate than John

In order to evaluate a sentence with *more* one needs a criterion for evaluating the quantity. When the plural *chocolates* is used, this must be the number of separate chocolates. As for *more chocolate*, the global quantity is evaluated, probably in terms of weight or volume. Thus, if Peter has eaten 5 big chocolates and John 6 quite small ones, the first sentence in (7) is false and the second true.
Barner & Snedeker (2005) show on the basis of a psycholinguistic experiment that the following equivalence holds:

(8)   Barbie has more pieces of furniture than us   ↔
          Barbie has more furniture than us

The contrast between (7) and (8) indicates that collective mass nouns such as *furniture* impose a criterion for counting when combined with *more*, while non collective mass nouns do not, which demonstrates that not only count nouns but also collectives involve a criterion for counting.
This complicates a view according to which count and mass are not represented in the lexicon as features but rather as properties of meanings. It is clear that *furniture* behaves like a mass noun in the sense that it does not take number morphology and does not allow for direct modification by a numeral. If a count sense created by a mass-to-count shift in the lexicon automatically results in count syntax, it is strange to assume that *furniture* has count semantics and yet no access to count syntax.
One way to stick to a "senses approach" to the count/mass distinction, while taking into account the existence of count senses without count syntax (as in the case of *furniture*), is to assume that collective mass nouns enter the lexicon with a count meaning and lexical incompatibility with number (cf. Chierchia 2010 for a similar view). This might be related to the group interpretation associated with these nouns (cf. Borer 2005: 103, note 13). As such, they could be seen as the mass counterparts of group nouns such as *committee* (cf. Chierchia 1998a: 86). Assigning an exceptional status to these nouns makes it possible to assume that count meanings result by default in the obligatory use of number morphology in syntax, unless they are lexically specified as being incompatible with number. This correctly predicts that a collective meaning is always the core meaning of a noun, and cannot be obtained by a shifting process. Whenever the meaning of a noun shifts towards a count meaning in a language with obligatory morphological number marking on nouns, the noun will be marked for number.
The borderline between collective nouns and non collective ones is by no means a simple one to draw. Consider cases such as *a drop of water* and *a grain of sand*. One may wonder whether the criterion for counting introduced by *grain of sand* and *drop of water* is introduced by the noun or by *grain* and *drop*. The *more*-test might offer a way out: it does not seem to be possible to say: #*This small heap actually contains more sand than that big heap over there* implying that the small heap contains more grains of sand.

4.3   "Count nouns" in numeral classifier languages

A related question is whether nouns in numeral classifier languages can be lexically count. The idea that Mandarin would be a language without a lexical mass-count distinction has been made for different reasons. In what follows it will be shown that the arguments that are offered in the literature are not valid and that there is evidence in favor of a lexical count/mass distinction in a language such as Mandarin.

A first reason why it has been assumed that numeral classifier languages do not distinguish between count nouns and mass nouns is the obligatory presence of classifiers in the context of numerals with both mass and count nouns, which is reminiscent of the insertion of measure terms with mass nouns in languages such as English. However, as shown in section 2.2.2 above, it is not true that mass nouns and count nouns introduce exactly the same structures, as one has to distinguish between sortal and mensural classifiers. The former typically combine with nouns that have a count interpretation (cf. Cheng & Sybesma 1999, Grinevald 2004).

According to some authors, classifiers are responsible for the presence of atomic structure in a very concrete way. Denny (1986) and Lucy (1992) argue for instance, that languages such as English have a lexical count/mass distinction while classifier languages do not, assuming that number marking does not introduce units of counting while classifiers do introduce such units. Based on psycholinguistic experiments among speakers of the numeral classifier language Yucatec (Mayan, Mexico), Lucy claims that his Yucatec subjects have a substance oriented way of viewing the world as compared to speakers of English.

Even though such a "parametric" view may seem appealing at first sight, the evidence in favor of this type of approach is not very strong. As shown by Li, Dunham & Carey (2009), a new set of experiments sheds serious doubts on Lucy's interpretation of his results, and shows convincingly that being speaker of a numeral classifier language does not affect one's perspective on substances and objects in the world.

From a purely linguistic point of view, the parametric approach is problematic as well (cf. Doetjes 1997). Some classifiers provide no information about what the atoms would be, and in this respect they do not differ from number morphology. Many classifier languages have for instance a so-called general classifier, which may replace other sortal classifiers, and does not contain any information about the units that are to be counted (e.g. Mandarin *ge*). Yet, it always triggers a count interpretation of the noun (see also Adams 1991). Moreover, numeral classifier languages often do not use classifiers in combination with expressions corresponding to large numbers. Rather, these expressions behave like classifiers themselves and are similar to English nouns such as *pair* and *dozen*. Again, no criterion for counting is present, yet a count meaning of the noun is necessarily present.

This is not to deny that in certain cases the choice of classifier may decide which meaning to pick for a polysemous noun. Zhang (2007) cites for instance the example of the noun *kè*, which means either class or course depending on the context. In the first case, the classifier *táng* is selected and in the second case *mén*. Similar cases of polysemy exist in non classifier languages. The Dutch noun *college* 'course, class' can have the same two interpretations as Mandarin *kè*. It is to be expected that a numeral classifier language with a rather large collection of sortal classifiers may pick different classifiers for different meanings of a polysemous noun, and this type of data should not be mistaken for evidence in favor of a mass interpretation of the noun at a lexical level.

Finally, it has been claimed that classifiers need to be present in order to trigger a count meaning (see in particular Borer 2005). However, it turns out that count meanings may impose themselves in the absence of a classifier. This is particularly

clear in the case of a grinding context. As shown by Cheng, Doetjes & Sybesma (2008), grinding is not possible in the following sentence:

(13)   qiáng-shang dōu shì gǒu   [Mandarin]
         wall-top   all be dog
         'There are dogs all over the wall'
         NOT: 'There is dog all over the wall'

This type of data is hard to understand if one assumes that the noun *gǒu* does not provide a criterion for counting. The lack of grinding in Mandarin is quite interesting in view of the fact that numeral classifier languages have been a model to explain the fact that in languages such as English nouns may shift so easily from count to mass interpretations and vice versa, and confirms the idea that grinding should be seen as a lexical operation.

As a whole, it seems clear that there are reflections of the count/mass distinction in numeral classifier languages. They are not only present in syntax, but there are also reasons to assume that lexical entries of nouns may provide a criterion for counting or not depending on the meaning of the noun. What these languages lack is not nouns with count semantics, but rather nouns with a difference between a singular and a plural form. In this sense they resemble languages such as Tagalog, in which nouns are number neutral. If this is right, the difference between Mandarin and Tagalog is not a lexical difference but rather a difference in the type of requirements certain elements in the language (numerals, demonstratives) impose on the nouns they combine with.

5.   Concluding remarks: count and mass across languages

From the data discussed above it seems that languages do not differ in having count meanings and mass meanings at a lexical level. However, they differ in the type of syntax triggered by count and mass meanings, in particular with respect to numerals. Numerals need something to count. As such, in order to combine them with a noun that has a mass meaning, either a measure term or mensural classifier has to be used, or the noun must shift towards a (usually lexically determined) count meaning. In case a noun has a count meaning, several things may happen depending on the language. In a language such as Tagalog nothing happens: the numeral combines directly with the noun. In a language such as English, nouns with count meanings are usually marked for number. If so, number marking is necessary in combination with the numeral. Finally, in numeral classifier languages such as Mandarin, nouns with a count meaning are not marked for number, and in order to use such a noun with a numeral, a sortal classifier has to be inserted. Even though this basic classification is useful, it is important to realize that languages may have mixed properties.

Quite in general, the patterns that have been discussed are in accordance with the Sanches-Greenberg-Slobin generalization: the general use of classifiers is restricted to languages without compulsory number marking on the noun. This has been related to the fact that these languages normally do not have number neutral count nouns while classifiers combine predominantly with number neutral nouns. Nouns that are morphologically marked for plural are usually incompatible with classifiers, but some exceptions exist (Yucatec, Allan 1977; Hausa, Zimmermann 2008). In both languages, number marking on a classified noun is optional. What does not seem to exist is a language in which the use of a numeral triggers both obligatory insertion of a classifier and obligatory plural morphology on the noun.

The reasons behind the existence of the Sanches-Greenberg-Slobin generalization are not clear at this point, given that number neutral nouns and plurals are usually assumed to have very similar if not identical denotations. Somehow both plurals and classifiers seem to "foreground" the atoms, to use Chierchia's (1998a) terminology. Further research needs to make clear what this foregrounding is and under what conditions plural nouns may co-occur with sortal classifiers.

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