EXPANDING AND EXPLAINING CLASSIFIER TYPOLOGIES

by

Scott M. Duede

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The thesis of **Scott Mathias Duede**

has been approved by the following supervisory committee members:

Edward Rubin	, Chair	**June 12, 2012** Date Approved
Aniko Csirmaz	, Member	**June 12, 2012** Date Approved
Randall Eggert	, Member	**June 12, 2012** Date Approved

and by **Edward Rubin** , Chair/Dean of

the Department/College/School of **Linguistics**

and by David B. Kieda, Dean of The Graduate School.

ABSTRACT

There has long been an assumption of a bilateral divide of languages into nonclassifier languages and classifier languages, i.e., those languages that do not use numeral classifiers when counting nouns and those that do use numeral classifiers. While this assumption holds for most languages, it cannot account for languages such as Armenian, which optionally allow for numeral classifiers to appear when nouns are counted, and also cannot account for languages such as Paiwan, a so-called poor-classifier language, which has numeral classifiers for certain noun classes and not for others. I propose that by adopting Borer's method of dealing with numeral classifiers and plural morphology as two expressions of the same underlying phenomenon, and by spelling out a specific syntactic mechanism for achieving the process outlined by Borer, we find a theory that is able to account for the full range of possibilities (i.e., nonclassifier, classifier, classifier-optional, and poor-classifier languages).

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CHAPTER 1

INTRODUCTION

There has been much discussion of so-called classifier languages, with efforts to understand them better being found in works such as Aikhenvald (2000), Grinevald and Seifart (2004), Li, Barner, and Huang (2008), and Wu (2009). Generally, the literature assumes that there actually exists a binary distinction; that there are nonclassifier languages and classifier languages. Li, Barner, and Huang (2008) build on this assumption, dividing languages like English into the nonclassifier language group, and languages like Mandarin Chinese and Japanese into the classifier language group (Li, Barner, and Huang 2008:251). This binary distribution follows naturally from a generalization made in T'sou (1976):

> The study of nominal classifier systems suggests an important hypothesis that the use of nominal classifiers and the use of plural morphemes [is] in complementary distribution in natural language. More correctly, it suggests that either a) a natural language has either nominal classifiers or plural morphemes, or b) if a natural language has both kinds of morphemes, then their use is in complementary distribution.
> (T'sou 1976:1216)

Borer (2005) and Tang (2004), however, show that there are languages that do not neatly fit among either the classifier or nonclassifier languages, and even apparently violate T'sou's (1976) generalization. Rather than expanding the set of language types, then, as Tang (2004) suggests doing, it would be ideal to unify classifier languages,

nonclassifier languages, and languages that do not fit in either group under one system with the explanatory power to predict the behavior of all of them together.

In order to accomplish this, I will lay out the shared features of nonclassifier languages, then show how they contrast with classifier languages. I will then present data for Armenian, a language Borer (2005) shows capable of behaving either way, and data from Paiwan, a language Tang (2004) argues is not adequately described as either a nonclassifier or a classifier language, but is, as that paper terms it, a poor-classifier language. Once all these data are presented, I will give an overview of the theoretical apparatus provided in Borer (2005) to reconcile the Armenian data with the nonclassifier/classifier distinction. Finally, I will provide an analysis of the actual syntactic machinery that could realize the system Borer (2005) describes. In so doing, I will show how Paiwan can also be made to work in the framework Borer (2005) provides. After this, I will discuss some remaining questions, advantages gained by adopting this analysis, and a future course of study.

CHAPTER 2

LANGUAGE TYPES

2.1 Nonclassifier Languages

In nonclassifier languages, there are no numeral classifiers. nonclassifier languages employ plural morphology when nouns are being counted, following a pattern similar to English, as the following data show.

(1) one cat

(2) five cats

(3) the cat

(4) some cats

The above exemplar phrases refer to complete specimens of a kind of animal, regardless of the specific number. The following example shows a slightly different case; that of a noun unmodified by determiner or numeral but still bearing a plural morpheme.

(5) cats

While not specifically enumerated, *cats* has been rendered a count noun. The noun without determiner, numeral, or plural morpheme (i.e., in this case, *cat*), would not necessarily refer to any specific cat. I will be following Borer (2005) and assume that the noun, lacking any plural morphology, numeral classifier, or overt determiner or

numeral, would be a mass noun (Borer 2005:88). A noun that refers to the concept or qualities of the noun, rather than specific instances of that noun, is a mass noun, as in the following example:

(6) Is cat eaten in any country?

cat above refers to no specific animal, only the class of animals denoted by the noun.

The difference between the way *cat* or *cats* is understood in the preceding examples and the way *cats* is understood with no overt numbers or determiners is the distinction between count nouns and mass nouns. According to Borer (2005), *cat*, again in the absence of overt determiners or visible counting, would be a mass noun, while *cats* would be a count noun. Count nouns mention discrete, unitized instances of a noun, whereas mass nouns lack any such specification of actual instances. Plural morphology is used to make the mass/count distinction, dividing the noun up into separate, countable units.

2.2 Classifier Languages

For a generally accepted definition of numeral classifiers, I turn to Aikhenvald (2000). Numeral classifiers are i) classifiers that are independent lexemes, or ii) classifiers that are attached to numerals, or iii) classifiers that are attached to the head noun (Aikhenvald 2000:98). Senft (2000) offers a further subdivision in Aikhenvald's (2000) numeral classifiers: Sortal classifiers divide a noun into countable units in terms to classes the noun is conceived of belonging to, and mensural classifiers do this by dividing into countable units purely by quantity. These numeral classifiers are the same thing referenced as "nominal classifiers" in T'sou (1976). From this point in, I will refer

to all such classifiers as "numeral classifiers," but will still discuss the differences between Senft's (2000) sortal and mensural classifiers.

In classifier languages such as Mandarin Chinese, there is no plural morphology. Instead these languages use numeral classifiers to accomplish the functions performed by plural morphology as described in the previous section. The following Mandarin examples are typical of numeral classifiers in other so-called classifier languages.

(7) yi zhi mao
one CL cat
'one cat'

(8) wu zhi mao
five CL cat
'five cats'

(9) yi xie mao
one several cat
'some/several cats'

(10) mao
cat
'(a/the/some) cat(s)'

There is no morphological change when *mao* refers to one or many cats. The addition of a classifier is what distinguishes a mass noun *mao* from a count noun *zhi mao*. The difference between single and plural instances of cat is left only to the numeral or specifier. If the noun is counted, the classifier (*zhi*) is present, otherwise the noun is a mass noun, indeterminate in quantity, as in Li and Thompson (1989).

Classifiers are used to make the mass/count distinction. Classifier languages always have a generic classifier. Mensural classifiers function in the same role as the measure words of nonclassifier languages as previously outlined, but they also take no plural morphology. Mensural classifiers, just like measure words, are typically derived from

existing nouns, so, as we will see, they should need plural morphology to make other things countable.

2.3 Armenian

Armenian is a difficult case in terms of categorizing as nonclassifier language or classifier language. Plural morphology is possible in Armenian for all nouns, but classifiers are optional, as the following data show from Borer (2005) show:

Cardinal, classifier, no plural

(11) Yergu had hovanoc uni-m
Two CL umbrella have-1SG
'I have two umbrellas'

Cardinal, no classifier, plural

(12) Yergu hovanoc-ner uni-m
Two umbrella have-1SG
'I have two umbrellas'

*Cardinal, classifier, plural

(13) Yergu had hovanoc-ner uni-m
Two CL umbrella have-1SG
(Borer 2005:95)

Borer (2005) points to the Armenian word "had" as one example of the Armenian system of numeral classifiers, not measure words: They do not take plural morphology. The important factor for Borer (2005) is that they are incompatible with plural morphology. Furthermore, the critical factor in distinguishing a nonclassifier language from a classifier language is that, by definition, nonclassifier languages will not have numeral classifiers. Armenian is not a good fit as a nonclassifier language, then, since examples like (11) clearly have numeral classifiers. Armenian can hardly be called a

classifier language either, though, given that its nouns do not, strictly speaking, require classifiers; Armenian nouns can take a plural marker when being counted instead of employing a numeral classifier, as in (12). Armenian is thus a problem for the bilateral distribution of languages as either nonclassifier or classifier languages: If these are the only two options available, where does Armenian go? When Armenian nouns take a numeral classifier, they cannot also take plural morphology, and vice versa, so the generalization about the mutual exclusivity of plural morphology and numeral classifiers that T'sou (1976) makes can still be preserved, even if the two-category system of classifier and nonclassifier languages cannot be preserved.

2.4 Poor-classifier Languages

In Tang (2004), the poor-classifier language Paiwan is shown to be outside of the nonclassifier language/classifier language paradigm altogether. A plural morpheme is available and a classifier is available for one noun class, the human nouns (hereafter [+Human]). For all other nouns, the class of nonhuman nouns (hereafter [Nonhuman]), neither a plural morpheme nor a numeral classifier seems to be available, and these nouns all appear bare, meaning that they have nothing to indicate whether they are mass nouns, or count nouns with the [Countable] and [Divided] features.

The following data show that, for most Paiwan nouns, there is neither a plural morpheme or numeral classifiers available.

(14) sepat a vatu
four A dog
'four dogs'

(15) ita a kun
One A skirt

'one skirt'

Paiwan nouns apparently can appear without anything to mark them as divided or countable, making Paiwan very difficult to group either with the nonclassifier or classifier languages. Tang (2004) provides no analysis of the function of the *a*, but makes clear that it is not related to either classification or plurality, which, given that the topic at hand is only classification and plurality, is sufficient analysis for our purposes. Nouns in nonclassifier languages should have a plural morpheme available, and that is lacking in Paiwan. Classifier languages should have numeral classifiers available when nouns appear with numerals, and Paiwan also lacks for numeral classifiers. So far, Paiwan is as difficult to group with either nonclassifier languages or classifier languages as Armenian, though for the opposite reason: while Armenian nouns can behave like either type of language, Paiwan so far can behave like neither.

Like Armenian, Paiwan does not group in with the nonclassifier languages or the classifier languages. Unlike Armenian, though, Paiwan also appears to break the pattern of T'sou's (1976) generalization, which has otherwise held universally, as discussed in Chapter 1: There are nouns in Paiwan which never take a numeral classifier when explicitly counted with a numeral, and these same nouns have no visible plural morphology. Before getting into those data, however, it is important to establish that some nouns do, in fact, take classifiers. Below are some data from Tang (2004) to show how the classifiers of Paiwan work.

(16) *(ma-)/*mane-cidil a kakeDian (Tang et al. 1998)
MA- MANE-one A child
'one child'

(17) *(ma-)/*mane-sepat a kakeDian
MA- MANE-four A child

‘four children’

(18) *(mane-)/*ma-Lima a kakeDian
MANE- MA-five A child
‘five children’

(19) *(mane-)/*ma-tapuLu a kakeDian
MANE- MA-ten A child
‘ten children’
(Tang 2004:389)

In these data, we see that “ma” or “mane” is required to appear. Tang (2004) argues that “ma-” and “mane-” are interchangeable forms of the classifier that marks the class of humans in Paiwan. The two forms differ, according to Tang (2004), in the numbers that they appear with, but both are used to mark the [Human] class of Paiwan nouns. Tang observes the following of Paiwan:

a. It has [+Human] classifiers like ma- and mane-.

b. It does not have overt plural markers like English –s or Chinese –men.

(Tang 2004:382)

For human nouns then, Paiwan seems to behave like a classifier language. It would not be in line with T’sou for a language to be split across the two language groups for different noun classes, however, and even if we allowed this, according to Tang (2004), nonhuman Paiwan nouns do not appear to function quite like nouns should behave in a nonclassifier language.

In Paiwan, as in Armenian, then, we have a language that does not properly fit into the nonclassifier language/classifier language paradigm. Tang (2004) refers to Paiwan as a poor-classifier language, but increasing the number of language groups is a less-satisfying solution to the problem than developing theoretical machinery to predict the actual behavior of the language. Also, Armenian seems able to fit into both, and

therefore neither, of the nonclassifier/classifier language groups. In the next chapter, I will begin to explain the partial solution to these problems laid out by Borer (2005), and will also show where that system is deficient in its ability to account for the behavior of Paiwan.

CHAPTER 3

BORER, NONCLASSIFIER LANGUAGES, CLASSIFIER LANGUAGES, AND ARMENIAN

Given that Armenian and Paiwan cannot be grouped with either nonclassifier languages or classifier languages, the system of dividing all languages into one or the other of these groups must be inadequate to describe the full range of human language. Borer (2005), which pointed out the Armenian data in the first place, offers a unified approach that does not require the dividing of languages into the nonclassifier and the classifier languages. Borer's (2005) system will be important in moving toward a solution that can deal with the apparent irregularities presented in Armenian and Paiwan.

Borer (2005) makes the claim that all nouns are, in the lexicon, mass, and for those nouns that will be count nouns, some additional element is required to render them mass no longer. In other words, mass is the default state for nouns. In order to be countable, the mass base form must be combined with something that does the job of rendering the noun divvied up into logical units that can thereafter be counted. Before nouns are so divided, attempting to count distinct instances of a noun is impossible, given the assumption that all nouns start as mass nouns. There is merely the notion of the noun, not units of the noun. There are nouns like *dog* which are more logically rendered

countable than other nouns like *water*. Nevertheless, *dog*-like nouns can be rendered mass, and *water*-like nouns can be rendered count. It is not that either type of noun is count in the lexicon, then; all nouns have to start in some form, and Borer (2005) makes the claim that that starting form is mass (Borer 2005:93).

Further, Borer (2005) claims that this divvying function, this portioning out of noun mass into logical units, is accomplished by plural morphology or by the projection of classifiers. In this way, plural inflection and classifier projection are two types of the same phenomenon. In this form, Borer's (2005) claim clearly relates to T'sou's (1976) previously discussed notion. Borer (2005) actually goes one step further, saying that "plural inflection is classifier inflection, thus accounting for the complementary distribution between classifier inflection and plural inflection, now reduced to the fact that they are simply distinct instantiations of the classifier system" (Borer 2005:95). Plural inflection and classifier projection are, therefore, two instances of the same type: that type is classifier projection, and plural morphology is just a special case of the more general classifier projection phenomenon. They are two different spell-outs of the same features, realized differently in different languages. For Borer (2005), there is no essential difference between the numeral classifiers of Mandarin Chinese and the number marking on nouns (i.e., singular/plural) in English.

Let us now look at some further aspects of Borer's (2005) account, which we will build on later in providing a better characterization of the range of phenomena being explored here. Borer (2005) requires two head features to deal with the mass/count distinction and actual counting of nouns:

> Under the system we have been developing here, and assuming the classifier head to be the open value $\langle e \rangle_{DIV}$, with DIV standing for

> divided, we note that the paradigm in (6b–d) receives a direct explanation if we assume that the plural suffix and the independent classifier can both assign range to $<e>_{DIV}$, and that the distinction between them stems from the fact that the 'plural' marker is a spell-out of an abstract head feature on a moved N-stem, while the 'classifier' is an independent f-morph. (Borer 2005:95)

Differences between these two 'spell-outs' or instantiations of is not important. I will focus on the itself.

If plural morphology is really a type of classifier, it must be demonstrated that in a language that lacks entirely for numeral classifiers, we can justifiably postulate the existence of the same syntactic structure as in a classifier language. Borer (2005) does this with English:

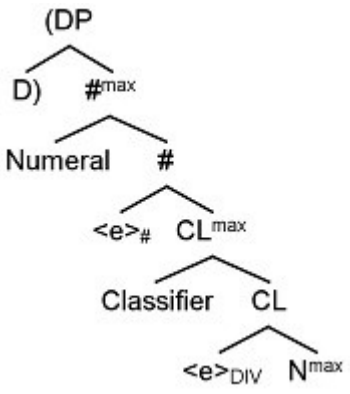
> I suggested that all nouns are born unspecified for any properties, including count or mass, and that as a default, and unless more structure is provided, they will be interpreted as mass. If this is indeed the case, then we must postulate in English, as evidenced in Chinese, a portioning-out structure, a CL_{max} headed by a CL^0, to give rise to count interpretation. (Borer 2005:108)

A good place to start looking for these portioning-out structures might be in DP, where we already know portioning out of some kind is performed. So why would *a dog* or *the dog* not receive a mass interpretation? Well, obviously these are not mass due to the presence of *a* or *the*. *The* can appear with mass nouns (e.g., *the waters*), but notice that this renders that ordinarily-mass noun counted: *The waters* refers to disparate bodies of water unitized so that they are all taken as a single unit. Why is *the three dogs* or *three dogs* acceptable, but not **the three dog* or **three dog*? (Borer 2005:109). Borer (2005) answers thus:

> In English, it is the plural inflection and the singular indefinite articles which are in effect the classifiers partitioning N mass, serving exactly the same function as Chinese classifiers. (Borer 2005:109)

What might be unclear here is that plural inflection and articles in English do not agree with any of the semantic features of the noun, and the classifiers in Mandarin are known to do so. This difference between the two languages deserves further examination, then: Why the rich system of agreement in Mandarin? Why should classifier languages have such a multitude of different classifiers for different classes, where a nonclassifier language such as English only have a single form of the definite article, and only arbitrarily irregular differences in the plural morphology?

I will be assuming the same syntactic structure for the Classifier Phrase as Borer (2005).



(Borer 2005:96)

 in the head of CL^{max} is either a head feature, which will attach to the noun as plural morphology, or an independent classifier f-morph, which will appear in this spot in the structure. Borer (2005) assumes this to be the structure for all languages, whether there is an overt classifier or not.

What Borer (2005) lays out is couched more in semantics than syntax, but more specifics about how these ideas work within the syntactic structure of a language is provided:

> To make the account more concrete, syntactically, we will assume that the assignment of a double range by a single morpheme, be it a or each, can be accomplished through the successive merger of each or every, or a or one, with the two distinct occurrences of the complex open value, $<e>_{\#(DIV)}$ and $<e>_{DIV(\#)}$, the first projecting CL^{max}, and the second projecting #P. (Borer 2005:113)

Borer (2005) provides a way of unifying nonclassifier and classifier languages by explaining that the two language groupings are really two sides of the same coin. The theory would be more powerful, however, if there were some rhyme or reason as to whether a language prefers plural morphology or numeral classifiers for rendering nouns divided and countable. Also, in the case of Armenian, we still have to wonder if there is some meaninful difference between a noun appearing with plural morphology, and a noun appearing with a numeral classifier. Furthermore, Borer (2005) fails to predict the behavior of Paiwan, in which the majority of nouns do not appear to require either plural morphology or numeral classifiers where Borer (2005) predicts one or the other should be mandatory.

Borer's theory could be improved if it built on the normal processes and assumptions underlying standard feature checking operation, some formalized way to understand the interaction of new units being added to a syntactic structure with the structure built up so far. Features typically require feature checking. Borer's (2005) system already seems compatible with such an approach: Certain features need to be present in a structure if a noun is going to have a count interpretation. This resembles the way we might talk about feature checking between a verb and its subject, for example: Certain features need to be present in the syntactic structure if (for example) a third person singular subject and a particular form of the verb will agree and be properly interpreted. The difference between suggesting a feature checking operation in Borer's

(2005) theory of dividing and counting nouns and suggesting a feature checking operation for subject/verb agreement is that while we have a formalized way to talk about the feature checking between verb and subject, no such formalization is provided in the discussion around feature checking in Borer (2005) for the feature checking between numeral and count noun.

Borer (2005) still fails to correctly predict the Paiwan data. We will need to build up a theory that accounts for the Paiwan nouns that appear to lack either plural morphology or numeral classifiers.

CHAPTER 4

THE SYNTACTIC SPECIFICS

4.1 The Need for Syntactic Machinery

Borer (2005) provides a good way of merging the way nonclassifier and classifier languages are understood. Borer (2005) is, however, still vague as to the syntactic machinery that explains the actual behavior of numeral classifiers and plural morphology. Borer (2005) provides a general principle: Numeral classifiers and plural morphology are both manifestations of the presence in the syntactic structure of features that unitize and allow for the counting of lexically mass nouns, as has previously been explained.

This general principle will not suffice as a complete explanation of the phenomenon, however, as it fails to account for a language like Paiwan, a poor-classifier language. Why, given only the theoretical framework in Borer (2005), would there be a language in which members of only one class of nouns, human nouns, manifest with a classifier? Borer (2005) can provide no real answer. Indeed, while there is an explanation of what might make it possible for Armenian to allow for either numeral classifiers or plural morphology, Borer (2005) does not supply any real explanation as to why that variation should exist in the language. Generalizing even

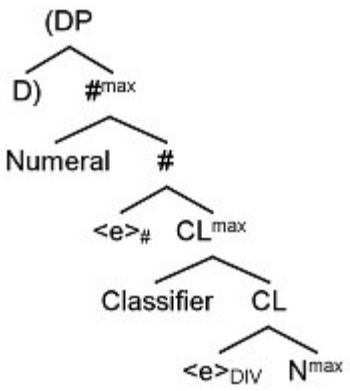
further, Borer (2005) does not provide any complete picture as to why a language should prefer plural morphology to a system of numeral classifiers or vice versa.

This lack in Borer (2005) seems to be a simple lack of syntactic machinery. This chapter will address this lack of theoretical mechanics, and in so doing, will provide answers for the questions posed above: Why should a language prefer one realization of the Dividing and Counting functions over the other, why do some languages have both plural morphology and numeral classifiers available, and finally, why should languages like Paiwan, so-called poor-classifier languages, require numeral classifiers in a very restricted domain (i.e., for only human nouns), and apparently have neither numeral classifiers nor plural morphology available for all other nouns.

To answer the questions Borer (2005) leaves unanswered, I will first lay out the theoretical assumptions needed for the syntactic machinery that will be employed, and will then demonstrate the operation of that syntactic machinery in the case of each of the types of language that have been highlighted, namely the nonclassifier languages, the classifier languages, the languages like Armenian in which either plural morphology or numeral classifiers may be used, and the poor-classifier languages.

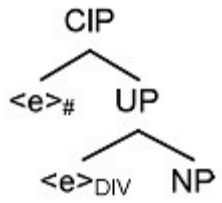
4.2 The Necessary Theoretical Machinery

We will begin by slightly modifying the syntactic structure of DP offered in Borer (2005):



The numeral classifier, when there is a numeral classifier, is an independent f-morph that bears the [Countable] head feature. This f-morph sits in the head of the Classifier Phrase, rather than the Numeral Phrase above it. In those cases where there is no numeral classifier, the head of the Classifier Phrase contains only the [Countable] head feature, with no independent f-morph. The difference between a structure with a numeral classifier and a structure with plural morphology instead, then, is the nature of the [Countable] head feature. In nonclassifier languages, the feature is not associated with its own independent f-morph, and in classifier languages, it is on an independent f-morph. The exact mechanics behind this difference will be spelled out in greater clarity in the following sections of this chapter.

Because it is the [Countable] feature in the Classifier Phrase head now, we must answer the question as to where the [Divided] feature goes in the structure. For this, I will posit the existence of a Unit Phrase between NP and the Classifier Phrase. It is in the head of this phrase that the [Divided] feature is to be found, should it be present in the structure, i.e., if the noun is not a mass noun, and has been divided into units. The resulting syntactic structure looks like this:



Aside from this structural assumption, the theoretical machinery being described should need only assumptions that are fairly standard to minimalist syntax. Lexical items start in the Numeration, and are then individually merged into the building syntactic structure. Once merged, a lexical item can move within its local domain. Features can be moved as well, moving into head adjoin configurations when they are. Movement typically occurs as the result of some sort of feature checking operation.

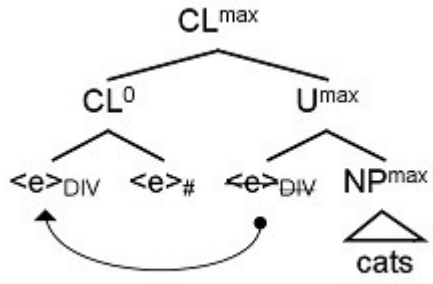
For nonclassifier languages, the [Countable] feature in the Classifier head position is a head feature and not an independent f-morph. The [Divided] head feature will move up to adjoin to the Classifier head position. Nothing in the Classifier head position is an independent f-morph, however, so these features will need to associate with the nearest available independent f-morph, the noun, as per Borer (2005). For nonclassifier languages, there may be noun class features that move up along with the [Divided] feature, like nominal gender features. Nominal gender features may be part of a relatively simple paradigm, such as [Masculine] and [Feminine] or [Masculine], [Feminine], and [Neuter] as in the Romance and Germanic languages, respectively, or possibly something more complex, as seen in the Bantu languages (Grinevald & Seifart 2004). For English, there will be no noun class features that move with the [Divided] head feature. The following examples are illustrative:

(20) I have three cats.

(21) ?I have cat.

(22) I have some cat.

(23) I have some cats.



In the first example above, *I have three cats*, there is a head feature, but no independent f-morph, sitting in the Classifier Phrase head position. Because it requires the presence of the [Divided] feature (i.e., $<e>_{DIV}$), the [Countable] feature (i.e., $<e>_{\#}$) probes down to the head of the Unit Phrase Recall that anything that is [Countable] in Borer (2005) must first be unitized into [Countable] units by the [Divided] head feature. This movement operation is the feature checking that is the reason for this requirement.

In the second example above, there is nothing in the head Classifier Phrase seeking any kind of valuation. This lack of a [Countable] feature means that nothing will probe for a [Divided] feature in the Unit Phrase head position, and the noun will be interpreted as a mass noun, nothing values the [Divided] and [Countable] features, yielding a marginal judgment. Borer (2005) shows that examples such as the marginal *I have cat* above happen because, while *cat* can be interpreted as mass, it is so far from the usual interpretation that speakers will try to insert the [Divided] and [Countable] features where there is no numeral to value them, leading to ungrammaticality (Borer 2005:101).

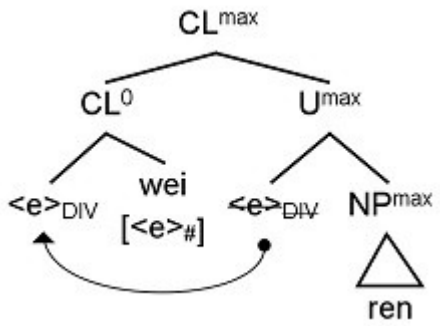
4.3 Classifier Languages

Classifier languages differ in two important ways from nonclassifier languages. First, the [Countable] feature in the Classifier head position is an independent f-morph, meaning that there will ultimately be a separate word, a numeral classifier, corresponding to this independent f-morph whenever nouns are counted. The second important difference in the way classifier languages work from what has already been show for nonclassifier languages is that the set of possible noun class features that move along with the [Divided] head feature will generally be much larger; this set of features can be anything within the range of possible noun classes set out in Allen (1977). This form of the [Countable] head feature will be present whenever there are noun class features that move along with the [Divided] feature up to the Classifier head position. Exactly as occurred in Mandarin Chinese, this independent f-morph in the Classifier head position will associate with the head feature that moved from where it was first merged into the structure, and will take the phonological form appropriate to the noun class features that moved with the [Divided] feature. When this form of the [Countable] feature is in the Classifier head position, the numeral classifier can explicitly indicate additional qualities about the unitized portions of the noun. Individual languages will vary, however, which class features were items present in the original Numeration, and which features the language specifies for. In Mandarin Chinese, for example, there will be more than fifty of these class features, some examples being [Respected Human], [Has A Handle], and [Broad And Flat], as in the following examples:

(24) wo kanjian san wei ren
I see three CL person
'I see three people.'

(25) wo kanjian san ba yizi
I see three CL chair
'I see three chairs.'

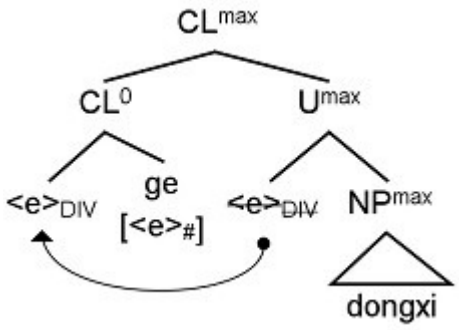
(26) wo kanjian san zhang zhi
I see three CL paper
'I see three papers.'



In all three of these Mandarin Chinese examples, the [Countable] feature that is an independent f-morph produces the numeral classifier corresponding to the class of the noun being counted. The [Divided] head feature, along with the class feature of the noun move up to join with the Independent f-morph [Countable] feature already in the Classifier head position. Being now associated with an independent f-morph, the [Divided] head feature and the noun class head feature will affect the phonological form of the independent f-morph in the Classifier head position, resulting in a numeral classifier marked for the class of the noun.

Even in cases where no noun class features move up to the Classifier head position, there will still be a numeral classifier. There will still be an independent f-morph in the Classifier head position, whether noun class features have moved there or not, and that independent f-morph will have some phonological form that will appear, though unmodified by any noun class features. This will produce the language's generic classifier, as in the following Mandarin Chinese example:

(27) wo kanjian san ge dongxi
I see three CL thing
'I see three things.'



The actual syntactic operation here is identical to the other classifier examples already discussed, except in that no noun class features moved up with the [Divided] head feature, since the noun *dongxi* "thing" does not allow for any noun class features. This lack of moved noun class features results (in Mandarin) in the generic numeral classifier *ge*.

The Mandarin Chinese case of a mass noun looks exactly like the English mass noun case described in Section 3. The following example is illustrative:

(28) ?wo you mao
I have cat
'I have cat.'

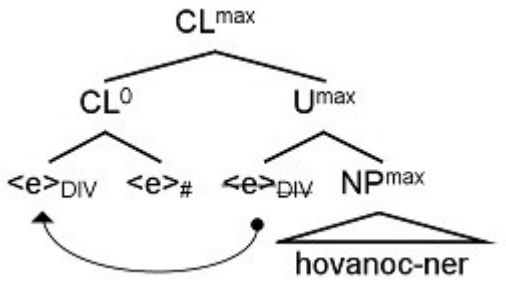
Just as in English, there is no probe in the Classifier Phrase head seeking any kind of valuation. Again, no probe means that the noun will be interpreted as a mass noun, as no feature checking operation takes place to value [Divided] and [Countable] features.

4.4 The Case of Armenian

In Armenian, there are two possibilities, either nonclassifier language-like behavior, or classifier language-like behavior, so I will posit the existence of two types of

[Countable] feature. One form is not an independent f-morph and so will function exactly as did the [Countable] head feature in the English examples above. When this is in the Classifier Phrase head position, the noun will have plural morphology instead of a numeral classifier, in the following manner:

(29) Yergu hovanoc-ner unim.
Two umbrella-PL have-1SG
'I have two umbrellas.'



Just as in the English, there is a [Countable] head feature that is not an independent f-morph that will merge into the Classifier Phrase head position. This Classifier Phrase head position will be targeted for the movement operation by the [Divided] feature. *Hovanoc* will be the available independent f-morph, so the [Divided] and [Countable] head features will associate with it, altering its phonological form to reflect that association, resulting in plural morphology.

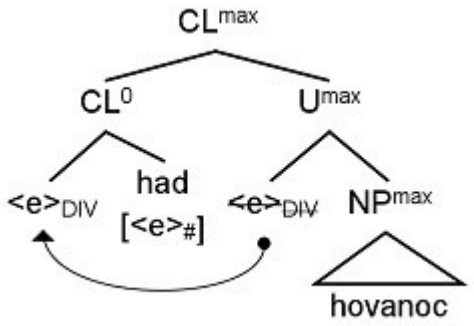
There is a second form of the [Countable] head feature in Armenian that is its own independent f-morph. This form of the [Countable] head feature will be present whenever there are noun class features that move along with the [Divided] feature up to the Classifier head position. Just like happened in Mandarin Chinese, this independent f-morph in the Classifier head position will associate with the head featured that moved from the site of their first merge, and will take the phonological form appropriate to the

noun class features that moved with the [Divided] feature. As with the Mandarin Chinese examples in Section 4, when this form of the [Countable] feature is in the Classifier head position, the language can explicitly indicate additional qualities about the unitized portions of the noun.

(30) Yergu had hovanoc uni-m

Two CL umbrella have-1SG

'I have two umbrellas.'



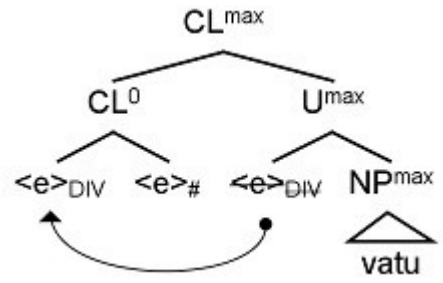
The Armenian nonindependent f-morph form of the [Divided] feature ends up producing plural morphology, just as in the English examples for the behavior of nonclassifier languages. Similarly, the Armenian form of the [Countable] feature that is an independent f-morph produces the numeral classifier corresponding to the class of the noun being counted, exactly like the examples with numeral classifiers from Mandarin in the previous section. The [Divided] head feature, along with the class feature of the noun move up to join with the Independent f-morph [Countable] feature already in the Classifier head position. Being now associated with an independent f-morph, the [Divided] head feature and the noun class head feature will affect the phonological form of the independent f-morph in the Classifier head position, resulting in a numeral classifier marked for the class of the noun.

4.5 The Case of Paiwan, a Poor-classifier Language

For poor-classifier languages, there is only one noun class head feature that enters the derivation with its own associated phonological form: the human class.

In Paiwan, and presumably in other poor-classifier languages, the [Generic] feature that would be responsible for the existence of a generic noun class and a default numeral classifier in a classifier language does not have any associated phonological form. It is a head feature only. This prevents the existence of a generic classifier in poor-classifier languages, meaning that only nouns belong to classes for which there is a feature with associated phonology (e.g., for Paiwan, any human noun) to have numeral classifiers. For nouns that do not belong to a class with an associated numeral classifier, there will be no default classifier, as is the case for *vatu* "dog" in Paiwan:

(31) sepat a vatu
Four A dog
'four dogs'



This example brings up an interesting question about Paiwan: Why, in the absence of a numeral classifier, do we not see some plural morpheme? Borer (2005) assumes that if counting is taking place, there must be either a numeral classifier or plural morphology present to convert the otherwise inherently mass noun meaning "dog" into something that can be counted. Tang (2004) assumes that there is nothing (i.e., neither a plural morpheme nor a numeral classifier) present in the nonhuman example above. If

we assume that instead of nothing at all being present, there is a phonologically null element in the structure in the Classifier Phrase head position, then suddenly nonhuman Paiwan nouns look much like English with regard to the Agreement for the features [Divided] and [Countable]. The phonologically null element in the Classifier Phrase head position will have the [Divided] head feature merge with it, and as nothing in the Classifier Phrase head position is an independent f-morph, they will appear on the noun itself, just as was the case for English plural morphology.

It is worth noting that all nonhuman Paiwan nouns work as does *vatu* above, showing no phonological form for the plural morpheme. For nouns of the [Nonhuman] Paiwan noun class, as in the above examples, we must assume that there is only one plural morpheme in Paiwan, and it is phonologically null. To be perfectly clear, we could just as easily assume that there is a phonologically empty generic classifier morpheme in Paiwan; the machinery laid out here would also work under that assumption. I assume it is a phonologically null plural morpheme instead, however, based on the precedent of what can be observed in other languages. Assuming that there is a phonologically null plural morpheme in a language is nothing new. While there may be no examples of invisible numeral classifiers, there are other languages with phonologically null plural morphemes, English being one example.

(32) One moose

(33) Five moose

(34) One deer

(35) Five deer

(36) One elk

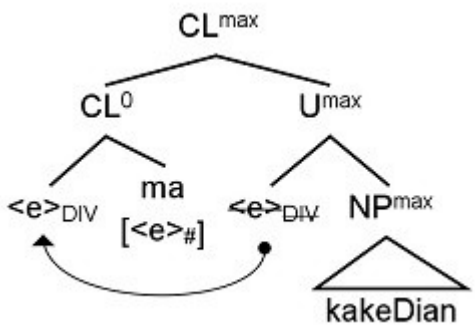
(37) Five elk

It is not difficult to suspect that, as is the case for *moose*, *deer*, and *elk* in the preceding English examples, some Paiwan nouns might have phonologically null realizations of the plural morpheme. The only unusual thing about the phonologically null plural morpheme in Paiwan is that it is the only plural morpheme in Paiwan. We derive two theoretical advantages from assuming that there is a phonologically null plural morpheme that applies to all nonhuman Paiwan nouns. First, T'sou's (1976) generalization, already discussed, will hold for Paiwan as it does all other languages. The plural morpheme and the numeral classifier in Paiwan still apply in mutually exlusive environments. Second, Borer's (2005) theory will also hold for Paiwan. For every noun that is counted, there will be either a numeral classifier or a plural morpheme representing the underlying features necessary for converting the mass noun from the lexicon into a count noun in the syntax.

As has already been mentioned, Paiwan nouns of the human class take classifiers:

(38) ma-sepat a kakeDian
CL-four A child
'four children'

(39) mane-Lima a kakeDian
CL-five A child
'five children'



The process demonstrated by these human class data resembles the Chinese numeral classifiers in some ways, but is not exactly the same. Just as in Mandarin Chinese, the [Countable] feature that is an independent f-morph produces the numeral classifier corresponding to the class of the noun being counted. The [Divided] head feature, along with the class feature of the noun, move up to join with the Independent f-morph [Countable] feature already in the Classifier head position. Being now associated with an independent f-morph, the [Divided] head feature and the noun class head feature will affect the phonological form of the independent f-morph in the Classifier head position, resulting in a numeral classifier marked for the class of the noun.

The numeral classifier (either *ma-* or *mane* depending on the number) is in the Classifier Phrase head position acting as the probe. The probe first seeks valuation from the goal lower in the tree, the noun. The noun will value neither the [Divided] nor the [Countable] feature. Unlike in Mandarin, the Paiwan probe is not sensitive to the [Classified] feature, but will value the [Human] feature by Matching with the noun. As the probe still bears unvalued features, the probe will next seek valuation of these features from the goal higher in the tree. In the example, where the numeral represents a quantity less than five (i.e., the first example, with *sepat*), Matching with the numeral will value the probe for the [Divided] and [Countable] features, but not for the [Five Or More] feature. In the second example with the numeral *lima* "five," the features [Divided], [Countable], and [Five Or More] will all be valued on the probe by Matching with the numeral. With a subset of its features valued, the Match Requirement will be satisfied by the agreement, and the syntactic computation can continue.

CHAPTER 5

CONCLUSION

The previous chapter has shown that if we expand Borer's (2005) theory with specific syntactic operations accounting for the process broadly described therein, namely the behavior of plural morphemes and numeral classifiers, the old system of dividing languages into nonclassifier languages and classifier languages is unnecessary. We no longer need to worry about whether a language is a nonclassifier or classifier language to determine how nouns interact with numerals or otherwise acquire mass or count specification. Instead, we simply look to the form of the [Countable] feature that that language deploys in the heads of its Classifier Phrases. Looking to the [Countable] feature in the head of the Classifier Phrase, whether it be a lone head feature, or an independent f-morph, frees us from the impossible task of trying to force Armenian into the nonclassifier or classifier language group, and alleviates the need to create a group of poor-classifier languages to account for the behavior of Paiwan.

All of this means that there are a lot of possible features that can be involved in this agreement operation. The feature set is not arbitrarily large, however. Allen (1977) gives a principled set of features that can be expected to be involved in classifier agreement. Allen's (1977) feature set is divided into seven categories, 1) material, 2) shape, 3) consistency, 4) size, 5) location, 6) arrangement, and 7) quanta. Material

further subdivides into animate, inanimate, and abstract/verbal nouns; shape is further subdivided into one-dimensional, two-dimensional, and three-dimensional shapes; consistency subdivides into flexible, hard/rigid, and nondiscrete; and size is subdivided into big and small sizes. I see no reason to expand beyond Allen's (1977) categorization. Also, the sensitivity of the probe sets another limit to how many features are involved in the agreement operation. Nouns in nonclassifier languages may also have the features outlined in Allen (1977), but since the probe is never sensitive to the generic classifier or any of these other noun features (i.e., never cares about the nature of the units into which the noun is divided), no agreement operation arises to demonstrate the actual presence or absence of those features on the noun.

It is possible that the machinery I have laid out in the preceding chapters could be generalizable to other kinds of classifiers beyond the numeral classifiers. I will leave it to others to determine whether or not that should be the case.

Even with the above program of future research laid out and left unexplored, the goal of my thesis has been achieved. The theory laid out in Borer (2005) has been expanded to accommodate a third typological class of languages, and the independent stipulation that the typological class of a language--whether classifier language, nonclassifier language, or poor-classifier language--can remain an accident of typology with allowable exceptions, rather than having to exhaustively account for the behavior of every language.

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