The numeral classifier in Upper Necaxa Totonac: Unitization and lexical specification

Michelle García-Vega
University of Alberta
mgarciav@ualberta.ca

The literature on the semantic contribution of the classifier to the numeral classifier construction is vast and fairly divided. Some views maintain that numeral classifier constructions semantically modify the head noun and contribute to the construction of meaning. In particular, the numeral classifier provides a unit for measuring or counting the noun that lack semantic properties needed for enumeration. Other views imply that the classifier in numeral constructions agrees with some inherent feature of the noun and serves purely formal or grammatical functions. Rather than adding to the meaning of the lexical noun, they categorize the set of nouns in a language into different classes. Numerals in Upper Necaxa Totonac are obligatorily prefixed with a classifier in counting under 20 (Beck 2011). Data from Upper Necaxa show that while some classifiers in classifier-numeral expressions serve important pragmatic and semantic functions, the system in general is lexically specified, satisfying purely formal or grammatical properties of the language.
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1 Introduction

Numeral classifiers are morphemes that obligatorily appear with numerals or quantifiers in the context of counting or quantifying. The numeral classifier construction is exemplified in (1) from Upper Necaxa Totonac (UNT), which shows the classifier *cha:'*- for 'humans' obligatorily prefixed to the numeral -*tin* 'one' in combination with the lexical noun *a'hlá'ha'* 'quetzal dancer.'

(1)	cha:'–	tin	a'hlá'ha'
	CLF:HUMAN–	*one*	*quetzal.dancer*
	'a Quetzal dancer'		

There are many views on the semantic contribution of the classifier morpheme to the classifier construction. One of the first analyses of the function and semantic contribution of numeral classifiers comes from Greenberg's (1972) seminal work on the typology of numeral classifier constructions**.** Greenberg maintained that numeral classifiers in combination with mass and collective nouns function as

unit-counters; they provide a unit for counting the noun because mass or collective nouns lack the semantic features necessary for enumeration. Greenberg's view is here referred to as *classic unitization* and exemplified in (2) where the classifier *kilha'k-* for 'loads,' or more specifically, 'horseloads' combines with the noun *kí'wi'* 'tree' or 'wood.'

(2) kilha'k– tin ki'wi'
CLF:LOAD– one tree/wood
'one load of wood'

The classifier *kilha'k-* used to count 'loads' in UNT may combine with certain nouns which may have a mass or collective reading, like *kí'wi'* 'tree' or 'wood' in (2). The classifier in the construction provides a unit for counting the noun which otherwise lacks this specific unit for measuring it.

More recent analyses of the semantic contribution of numeral classifiers to the noun phrase (NP) are found in Lucy (1992, 1996, 1997, 2000, 2014 & 2015), Lucy & Gaskins (2001), Senft (2000), Borer (2005) and others; these authors have taken Greenberg's classic view of numeral classifiers as unit-counters and extended it to make claims about the cognitive status of the noun in numeral classifier languages in general. Borer (2005) describes nouns in classifier languages as concept nouns similar in meaning to 'banana-ness' or 'banana-hood.' Lucy's view, here I term the *neo-unitization* view, claims, for example, that the Yucatec noun *háas* 'banana' in (3a–b) is a genotype or substance noun that means something like 'banana-type' or 'banana-substance' (Lucy, 1992, p. 329). For these authors, the numeral classifier, or unitizer, contributes toward the construction of reference by specifying discrete properties of a lexical noun that lacks these features.

(3) a. 'un– tz'íit háas
one– CLF:1DIMENSIONAL banana
'the banana fruit'

b. 'un– wáal háas
one– CLF:2DIMENSIONAL banana
'the banana leaf'

According to Lucy, Yucatec nouns are vague resembling a genotype, so the numeral classifier is required by the lexical semantics of the noun for unitization. The analysis implies that the noun *háas* 'banana' lacks definite features or discrete properties. The numeral classifier or unitizer for one-dimensional objects *-tz'íit* in (3a) and the classifier for two-dimensional objects *–wáal* in (3b) contributes the unit for counting the noun, which is otherwise understood as a genotype noun by speakers of Yucatec.

Other authors such as Allan (1977), Denny (1984), and Aikhenvald (2006) have suggested that the classifier in numeral classifier constructions reflects an

inherent property of the lexical noun and serves purely formal or grammatical functions. Under this view, the classifier is seen more as semantically redundant, as opposed to a semantically rich morpheme. A numeral classifier expression where the classifier seems not to contribute any semantic information to the construction and only serves purely grammatical functions is exemplified in UNT in (4).

(4) cha:'– tin ni:n
CLF:HUMAN– *one* *dead.person*
'one dead person'

The classifier *cha:'-* for 'humans' is obligatorily selected to match the semantic property of the human noun *ni:n* 'dead person'. The human classifier does not contribute new information to the noun phrase but rather agrees or reflects an inherent property of the lexical noun.

Upper Necaxa Totonac is part of the Northern branch of the Totonacan language family spoken in Puebla State, Mexico. In order to explore the semantic contribution of the classifier morpheme to the numeral classifier construction in UNT, we constructed a database of over 900 numeral classifier phrases and sentences in context, and examined over 2000 dictionary entries from the *Upper Necaxa Totonac Dictionary* (Beck 2011) detailing nouns and the classifier used to count them. Uncited Totonac data are drawn from the lexical database for the Upper Necaxa Totonac Project compiled by David Beck. The data show that the classifier can semantically contribute to the construction of reference, along the lines proposed by Greenberg (1972), but the system, in general, is lexically specified—that is, a formal or grammatical property of the language. Since UNT nouns are fully-specified in semantic terms, only mass or count nouns in combination with classifiers that reflect properties of the noun contingent on context provide a unit for constructing reference, while count nouns with classifiers that reflect inherent properties of the referent demonstrate a more obligatory agreement relationship with the noun. Further, fully specified nouns in classifier languages, like UNT, challenge the neo-unitization view, since it could only be sustained if nouns in classifier languages *always* appear in a classifier construction since their lexical semantics require unitization. In the discussion below, we present three distinct views on the semantic contribution of the classifier morpheme to the noun phrase (§2). We then show that while some classifiers construct reference and unitize the NP similar to Greenberg's classic view, the system in general is a grammatical property of the language (§3).

2 Three views on the semantic contribution of the classifier morpheme to the NP

There are several views in the literature on the semantic contribution of numeral classifiers to the noun phrase (NP). In section 2.1, we explore Greenberg's (1972) analysis of classifiers as unit-counters—the classic unitization view, which

suggests that unitization is a property of mass and collective nouns. In section 2.2, we look at Lucy's analysis (from 1992 to 2015), the neo-unitization view, which claims that the classifier morpheme specifies discrete properties of a noun that is unspecified for any discrete features. In section 2.3, we explore what we call the lexical specification view—namely, the view supported by Aikhenvald (from 1998 to 2010) that the classifier in numeral expressions merely reflects or selects some inherent semantic feature of the noun, and may therefore be better described as serving a more grammatical function in the language.

2.1 Greenberg's classic unitization view

One of the first and most influential works on the function of numeral classifiers was Greenberg's (1972) typological study of 100 numeral classifier languages. Greenberg claims that classifiers categorize the head noun into semantic classes, but he further observes that in combination with mass and collective nouns, the classifier provides a unit for counting the noun similar to the way nouns like 'cup,' or 'cratefuls' provide a unit for counting certain nouns in English. Greenberg names classifiers that participate in unit-counting *unit-counters*. This construction was later analyzed by Lucy as a morpho-syntactic process called *unitization*, and the classifier morpheme was considered a 'phrasal modifier' and labeled a *unitizer* part of a *unitizer construction* (Lucy, 1992, p. 73, & 1996, p. 59). Greenberg's view that some classifiers are unit-counters, or unitizers, is here referred to as the *classic unitization* view. The view entails that unit-counting occurs with nouns that cannot enter into a direct construction with a numeral, as in English phrases like **one oil* vs. *one liter of oil*, and **one cattle* vs. *one head of cattle*, or nouns which require an intervening measure term for the purposes of counting—for example *three pears* vs. *three baskets of pears*. The hypothesis depends on nouns to make mass, collective, and singulative distinctions, which he demonstrates with the examples in (5a–c), where a variety of classifiers are compatible with the same noun *bùrì* 'cigarette' in Thai (Greenberg, 1972, p. 10).

(5) a. bùrì sŏŋ sɔŋ
cigarette *two* *CLF:PACK*
'two packs of cigarettes'

b. bùrì sŏŋ lŏ
cigarette *two* *CLF:DOZEN*
'two dozen cigarettes'

c. bùrì sŏŋ muan
cigarette *two* *CLF:LONG-OBJECT*
'two cigarettes'

According to Greenberg, in Thai the noun *bùrì* 'cigarette' in combination with the classifier *sɔŋ* 'packs' in (5a) and *lŏ* 'dozen' in (5b) forces the collective

reading of the noun, which requires a unit for measuring or counting the noun when it refers to a group or collection of entities. In (5c), the classifier *muan* for long objects highlights an inherent property of the noun *bùrì* and does not participate in unit-counting *per se*. For Greenberg, the difference between constructions that unitize or do not is concerned with the semantic nature of the head noun; in one case, the result of adding the numeral classifier is an NP referring to a group of entities as in (5a–b), which if divided in two would result in two smaller groups of entities. However, adding the classifier in (5c) results in an NP referring to individual entities, in this case cigarettes, which if divided in two would result in broken a cigarette. In classic unitization, only nouns with collective and mass readings unitize, while count nouns with singulative readings do not.

Greenberg's claim implies that, in context, nouns are not lacking in semantic features necessary of adequate reference, and therefore are not vague, i.e. they are not genotype or concept-like nouns. Rather, his view implies that nouns are fully specified lexical items that do not lack the semantic features necessary for reference. This implication is in stark contrast with Lucy's neo-unitization view described in section (2.2). The distinction between classic unitization and neo-unitization is mostly about the semantic nature of the head noun, which may often be a result of the linguist's translation of the noun as discussed in section (3.2).

2.2 The neo-unitization view

Classic unitization is reanalyzed in Lucy (1992), Lucy & Gaskins (2001), and extends into Lucy's work in (2014 & 2015), where the notion of unit-counting is extended to make claims about the nature of nouns in classifier languages. Lucy holds that nouns in classifier languages are unspecified for the property of discreteness, and are better described as genotype nouns. This view implies that nouns, such as *bùrì* 'cigarettes' in Thai shown in (5a–c) are type or substance nouns, which therefore mean something like 'tobacco' or 'cigarette-type.' The numeral classifier (*muan* 'long-object', *lŏ* 'pack', or *sɔŋ* 'dozen') is then required by the noun for unitization. To support this view, Lucy presents the examples from Yucatec Maya in (6a–e), which demonstrates that changing the classifier in each example alters the meaning of the whole NP and constructs different referents (Lucy, 1992, p. 74).

(6) a. 'un– tz'íit háas
one– *CLF:1DIMENSIONAL* *banana*
'the banana fruit'

b. 'un– wáal háas
one– *CLF:2DIMENSIONAL* *banana*
'the banana leaf'

c. 'un– kúul háas
one– CLF:PLANTED banana
'the banana plant/tree'

d. 'un– kúuch háas
one– CLF:LOAD banana
'a bunch of banana'

e. 'un– p'iit háas
one– CLF:BIT banana
'a bit of banana'

In Yucatec Maya, a variety of classifier morphemes distinguish between the various ways the noun *háas* 'banana' could be interpreted by highlighting or specifying the form of the lexical referent for the 'fruit' in (6a) 'leaf' in (6b), 'plant' in (6c), 'bunch' in (6d), or 'bit' in (6e). The neo-unitization view means that speakers of Yucatec understand nouns, like *há'as* 'banana', as indicating the referent's type or substance, and the classifier indicates its individuation status, its unit, or its quantity. Lucy then extends his analysis to the examples in (7a–e) to argue that these phrases are also unitizer plus genotype noun constructions (Lucy 2000, p. 329).

(7) a. 'un– tz'íit kib'
one– CLF:1DIMENSIONAL wax
'a candle'

b. 'un– tz'íit che'
one– CLF:1DIMENSIONAL wood
'a stick'

c. 'un– tz'íit nal
one– CLF:1DIMENSIONAL corn
'an ear of corn'

d. 'un– tz'íit háas
one– CLF:1DIMENSIONAL banana
'a banana fruit'

Lucy claims that each noun, *kib'* 'wax,' *che'* 'wood,' *nal* 'corn,' and *háas* 'banana' in (7a–d) is understood by Yucatec speakers as making vague reference to a non-discrete entity which requires the classifier for unitization. For all noun types in the examples, the numeral classifier unitizes the non-discrete noun by specifying the form or unit of the referent to construct things like a candle, stick, ear of corn, or the banana fruit.

The neo-unitization view holds that numeral classifiers are required by the lexical semantics of vague or genotype nouns because the noun lacks adequate specification of the units needed for enumeration. In the strong sense, the view implies that *all* nouns in classifier languages are vague by having something like only one, polysemous, lexical entry in the mental lexicon. In the weaker sense, only those nouns that are defined as lacking a discrete feature are vague and require the classifier for unitization. Lucy's evidence is that the noun 'banana' in Yucatec may appear with a variety of classifiers, and therefore must be interpreted as [-discrete] by speakers for unitization to take place; otherwise, Lucy's unitization analysis does not apply. That Lucy's view is more about the polysemy, or vagueness, of nouns rather than a theory on the function of numeral classifiers is also found in Lehmann (2008, p. 3). On the other hand, Greenberg's view implies that nouns are fully-specified lexical items that are homophonous, this term being neutral as to whether the homophony is accidental or related. The homophonous nouns are therefore merely ambiguous outside of context but represent distinct, and fully specified entries, in the mental lexicon.

2.3 Lexically specified classifiers: Sortals and mensurals

For Lucy and the neo-unitization view, the classifier unitizes the NP construction by contributing a discrete feature to an inherently non-discrete noun. Other authors, like Allan (1977), Denny (1984), Aikhenvald & Green (1998), and Aikhenvald (2000, 2006, & 2012) hold that numeral classifiers do not unitize in Lucy's neo-unitization sense at all. Instead, these authors argue that classifiers are grammatical items that reflect some property of the lexical referent. In particular, Aikhenvald's (2006) typological study of over 500 classifier languages maintains that classifiers are like grammatical items that function as categorization devices. The classifiers group nouns into classes that are loosely semantic, but have some degree of arbitrary or lexicalized membership. Specifically for numeral classifiers, Aikhenvald distinguishes sortal and mensural classifiers. Sortal classifiers are those that pick out an inherent, or what Aikhenvald calls a "permanent," property of the noun. Typical sortal classifiers include those which are used with nouns referring to animate entities, like human or animal, or which reflect intrinsic physical properties of the noun, like its dimensionality, shape, form, or consistency. The examples in (23) and (24) from Palikur, a North Arawak language, demonstrate that the classifier is correlated with some inherent property of the referent noun (Aikhenvald & Green 1998, p. 445).

(8) a.

nah	ka–	daha	–ni	paha	–kti	pilatno
1SG	*ATT–*	*for*	*–PO*	*one*	*–CLF:PLANT*	*banana*

'I have one banana plant.'

b. ba pis muwakha ax paha –t
INTER *2SG* *want* *eat* *one* *CLF:VERTICAL*
'Do you want to eat one (banana) fruit?'

The noun *pilatno* in Palikur refers to two distinct referents; in (8a) *pilatno* refers to the banana plant, and in (8b) the elided noun recovered by context refers to the fruit. The 'plant' classifier *-kti* in (8a) may help disambiguate the noun by clarifying for the addressee that the noun *pilatno* belongs to the category of 'plants'. The classifier *-t* for 'vertical objects' in (8b) is chosen based on the inherent properties of the elided nominal referent, the banana fruit. The classifier in this view might help disambiguate a homophonous noun by highlighting the category that the noun already belongs to, but it does not contribute new information to the noun phrase. The classifier may help clarify the referent that the noun *pilatno* refers to in the same way context helps disambiguate *pilatno* 'banana fruit' in (8b). While it may seem like the speaker has a choice in classifier morpheme, *–kti* for the 'plant' or *–t* for the 'fruit,' this choice seems to be a result of the ambiguous glossing of the noun *pilatno*. If the noun *pilatno* were more specifically glossed as 'banana plant' in (8a) and 'banana fruit' in (8b), the obligatory semantic relation between classifier and noun would be more apparent. Seen in this light, this obligatory agreement between noun and classifier construction is lexically specified.

The other type of numeral classifier Aikhenvald distinguishes is the mensural classifier, a classifier that functions in the same way as Greenberg's unit-counters or unitizers. The choice of mensural classifier is determined by properties of the noun that are contingent on context, or what Aikhenvald refers to as "temporary" qualities of the noun, such as its quantity, measure, or physical arrangement, like bunches, groups, handfuls, and rows. These classifiers are used for measuring units of both count and mass nouns, the choice of classifier dictated by the unit of counting as demonstrated in (9a) and (9b) in Palikur (Aikhenvald & Green 1998, p. 444).

(9) a. paha –bru upayan
one *–CLF:GROUP* *duck*
'one flock of ducks'

b. paha –uku –wa kumat
one *–CLF:HAND* *–EMPH* *beans*
'one handful of beans'

The mensural classifiers in (9a–b) can be said to unitize the construction by suggesting a plurality of entities that are in a particular arrangement, like a group or handful. The classifier does not agree or pick out a property inherent to the noun since being in the arrangement of a group or handful is not in the meaning of the word *upayan* 'duck' or *kumat* 'beans.' Rather, the classifier specifies a unit of ducks or beans that is contingent on the context and therefore contributes to

the meaning of the noun phrase. Since mensural classifiers select contingent, or temporary, properties of the noun, speakers may have an option in the choice of classifier, but the choice of classifier is still dictated by contingent properties of the referent.

Though it seems that there may be more freedom in the choice of mensural classifier, these classifiers may also demonstrate strict lexical specification and still be semantically contributive to the NP. Lexically specified mensural classifiers are seen in more conventional numeral expressions, expressions that have been traditionally or socio-culturally constructed, and now represent a fixed phrase. Aikhenvald (2000) exemplifies strict specification with the mensural classifier *mal* in Korean, which is used exclusively to measure rice wine in terms of an institutionalized measuring cup, as in (10) (Aikhenvald 2000, p. 115).

(10) makkeli han mal
rice.wine *one* *CLF:RICE.WINE*
'one measure of makkeli (rice wine)'

The mensural classifier *mal* in (10) helps unitize the construction by providing a unit for measuring rice wine. At the same time, the classifier *mal* is the only classifier that can be used for this purpose. The numeral NP construction is a lexicalized expression used conventionally by Korean speakers. Though the classifier does unitize by providing a means of counting servings of the drink, the choice of mensural classifier is conditioned by some contingent (i.e. its place in some kind of container, its measure, or quantity) or inherent (i.e. its liquid form) physical property of the referent. The mensural classifier demonstrates that lexically specified classifiers are also culturally specific functional morphemes that may be accounted for by socio-cultural conventions and traditions.

3 Properties of numeral-classifiers in Upper Necaxa Totonac

Upper Necaxa Totonac (UNT), part of the Totonacan language family, is spoken by about 3,400 speakers in four villages around the Necaxa River Valley in the Sierra Norte of Puebla State, Mexico. Numerals in Upper Necaxa are obligatorily prefixed with a classifier in counting under 20; greater numbers optionally take a classifier (Beck 2011 & 2004). Numeral classifiers in Upper Necaxa divide the set of nouns in the language into roughly 34 disjunct classes (Appendix A). Each noun occurs with one lexically-specified classifier, though nouns compatible with mensural classifiers may appear with more than one lexically-specified classifier. The semantic categories of the classifier system are fairly typical of numeral classifiers. They may function as *sortals*, which include classes such as type of living being (humans, animals, plants), shape, dimension, and form, and *mensurals*, which may include classes contingent on the configuration (roll, handful, container) or arrangement (bunches, rows, loads).

(11) a. la'ha– tu' chichí'
CLF:ANIMAL– two dog
'two dogs'

b. hen– lhú:wa' puchí' –ni'
CLF:LONG.THIN– many rotten.log –PL
'many rotten logs'

c. pa:– tín refresco
CLF:CONTAINER– one soft.drink
'one pop'

d. tzan– kaujtú' i'x– li:né'he'
CLF:ROLL– twelve 3PO– leaves
'twelve rolls of leaves'

e. ma'h– kitzís ó:raj
CLF:TIME– five hour
'five o'clock'

The sortal classifier *la'ha-* in (11a) reflects that the nominal is an animal, and in (11b) the classifier *hen-* functions as a sortal with nouns that are 'long' and 'thin'. The classifier *pa:-* in (11c) is mensural when used with liquids or substances to designate container-like objects such as bottles, cups, or baskets, similar to the mensural classifier *tzan-* in (11d) used to measure things that are tied into rolls. Finally, the classifier *ma'h-* in (11e) appears with nouns that express time as measured by the clock.

Numeral classifiers may also serve as anaphoric devices, as is common in many languages, exemplified in (12a–b).

(12) a. i'k– ka:– pu:lhe'hé –lh kin– kawa:yúj
1SG.SUB– PL.OBJ– count –PFV 1PO– horse
he: a:– la'ha– tín sput –a
and ADD– CLF:ANIMAL– one finish –IMPF
'I counted my horses and one (horse) is missing.'

b. lhenhlhenhlh ta– ta:ya: –nan –lh
IDPH 3PL.SUB– stand –ST.PL –PFV
i'x– li:ká:n –kan̲ i'x– helha– tá:'ti' –ka'n
3PO– rifle –PL.PO 3PO– CLF:HUMAN– four –PL.PO
'The four of them carried their rifles.'

In (12a), the classifier construction *a:la'hatín* 'one animal' makes anaphoric reference to *kawa:yúj* 'horse'. The classifier construction in (12b) is also used

anaphorically in a very specific construction that means something like ‘group of N people’.

Some classifiers appear not only in enumerative constructions, but can also appear in adverbial expressions. For instance, the numeral classifier with *ma'h-* may appear with a nominal to express time as shown in (11e), but *ma'h-* plus a numeral without a noun may also be used in adverbial expressions of time as in (13).

(13)	ma'h–	tu'	i'k–	wa'yan	–ya:	–uj
	CLF:TIME–	*two*	*1SG.SUB–*	*eat*	*–IMPF*	*–1PL.SUB*
	chi'	tinta'kú:'j				
	how	*all.day*				
	‘We eat twice during the day.’					

The classifier expression *ma'htú',* meaning something like ‘twice’ in English, modifies the event and is used adverbially, which demonstrates that these classifiers have other functions other than specifying the number of nominal referents.

Additionally, the numeral classifier prefix *laka-* appears with a numeral but without nominal complements and conventionally designates locations, as in (14a–b).

(14) a.	tza'má	ju:n	laka–	tin	ta:yá
	that	hummingbird	CLF:PLACE–	one	stand
	hos	–nun	–ta:yá		
	fly	–DTRN	–stand		
	‘The hummingbird hovers in place.’				

b.	laka–	tin	laka–	tin	ta–	laka–	a'n
	CLF:PLACE–	*one*	*CLF:PLACE–*	*one*	*3PL.SUB–*	*face –*	*go*
	ta–	ta–	la'haspi't	ya:	–nan	–lh	
	3PL.SUB–	*DCS–*	*face.turn*	*stand*	*–ST.PL*	*–PFV*	
	‘They look here and there, they are looking around.’						

The numeral classifier construction *lakatín* is an expression of static location which means ‘in one place’ in (14a), and may be used idiomatically as part of a construction meaning something like ‘here and there’, demonstrated in (14b).

In addition to classifiers playing a variety of syntactic roles, they may also be used in pragmatically marked ways, which demonstrates that there is some flexibility in the system. For instance, classifier constructions may further be manipulated for rhetorical purposes, as in (15) where the speaker chooses the classifier *tan-* for ‘animals’ to make a disparaging remark about the human referent:

(15)	lhú:wa'	nak=	Chicontla	tza'j	
	many	*LOC=*	*Chicontla*	*only*	
	tan–	tojón	kristiánu'	chin	–lh
	CLF:ANIMAL–	*seven*	*person*	*arrive.here*	*–PFV*

'Those seven bloody Chicontecos arrived at Chicontla.'

The expression in (15) is rather unusual since it uses the animal, rather than human, classifier, but it demonstrates that there is some degree of freedom in the classifier system for rhetorical and metaphorical purposes that, at times, is constrained by the semantic properties of the head noun, but not entirely restrained by it. Becker (1986) demonstrates in Burmese, that the classifier system is functionally and semantically complex in ways that are constrained by the language inextricably linked to the social and cultural context of the construction. In similar ways, the classifier system in UNT serves important discourse functions, which may be manipulated for rhetorical purposes and other pragmatic effects that contribute semantically to the NP expression, but in many ways form idiosyncratic, and conventionalized expressions.

Although there is some flexibility in the classifier system, close examination of the UNT data show that the system is in general lexically specified, and that classifiers in their ordinary uses are a formal property of the grammar. In section (3.1), we will show how the classifier system in UNT is lexically specified, even when classifier constructions participate in Greenberg-style classic unitization. We further show that a semantically additive analysis of classifiers is very much compatible with the view of lexical specification. Finally in section (3.2), we will show that classifiers cannot be said to construct reference in Lucy's sense, because nouns in UNT are not interpreted as having no specific meaning outside of the classifier construction, but are rather fully specified in semantic terms. Fully specified nouns in classifier languages challenge the neo-unitization view that the noun requires the classifier to construct reference, and demonstrates that the neo-unitization view is the result of a misanalysis of the noun.

3.1 Lexical specification in Upper Necaxa Totonac

Aikhenvald holds that numeral classifiers are grammatical morphemes that may have sortal or mensural functions, an observation recently acknowledged by Lucy (2015). In this section, we provide further evidence for lexical specification and the disambiguating role of classifiers in distinguishing between two homophonous, but distinct, nouns using data from Upper Necaxa Totonac. The lexical specification view implies that the classifier does not contribute semantic specification to an unspecified noun, but rather some nouns are ambiguous between a variety of lexical referents outside of context, which may therefore lead the linguist to mis-translate an ambiguous lexical noun as being a vague or polysemous one as discussed in section (3.2).

Classifiers that function as sortals provide clear examples where the classifier morpheme does not contribute semantic specification to the meaning of the noun and is best described as being lexically specified. Sortal classifiers include those that are predictable based on the inherent shape of the nominal complement, as in (16a–b), where the classifier morpheme is selected obligatorily in agreement with a semantic property of the noun.

(16) a. pe'h– tin lhta'ká'la'
CLF:FLAT.THIN– one board
'one board'

b. pa:– tin a'kchukút
CLF:CONTAINER– one gourd
'one gourd'

The nouns in these examples are not unspecified for some semantic feature, which require the classifier to construct reference. That the classifier agrees with some property of these nouns, and does not contribute semantically to the expression is demonstrated in (17a–b) where the nouns appear outside the classifier phrase and make adequate reference.

(17) a. kalhta'há' –j chú'ku' lhta'ká'la'
flat –ADV cut board
'Cut the board thick!'

b. a'kchukút wi:lh tu: tan– há'lha'
gourd sit REL bottom– big
'There are certain gourds that are larger at the bottom'

In (17a–b) the nouns *lhta'ká'la'* 'board' and *a'kchukút* 'gourd' appear without the numeral classifier construction and make adequate non-ambiguous reference. In fact, *all* nouns in UNT may appear outside the classifier phrase and make adequate reference, and the classifier is only necessary if the speaker wants to explicitly specify the number of entities. Therefore, the classifier *pe'h-* 'long/thin' functions as a sortal classifier in the construction in (16a) as does *pa:-* 'container' in (16b), both of which are fairly predictable based on the semantic properties of the head noun, and demonstrate that the classifier is in some kind of agreement relation with this noun. This agreement between classifier and noun in these constructions is obligatory; the speaker has no say in the choice of classifier: if the speaker needs to count boards, they must use *pe'h-*, and to count gourds, they must use *pa:-*. Changing the classifier in the expressions in (16a–b) does not result in a change of reference, but may result in an ungrammatical or pragmatically marked expression.

Typical sortal classifiers also include those which go with animate nouns, like those denoting humans, animals, or plants. Even though these classifiers are

more predictable based on the semantic properties of the noun, they may still participate in idiosyncratic lexicalized constructions. For example, in UNT, the classifier *cha:'-* is used for counting one to three people as in (18a), and the classifier *helha-* is used in constructions for counting more than three humans as in (18b).

(18) a. cha:'– tín chi'xkú'
CLF:HUMAN– one man
'one man'

b. helha– tá:'ti' chi'xkú'
CLF:HUMAN– four man
'four men'

The requirement that the classifier *cha:'-* in (18a) be used for counting three people or fewer and the use of *helha-* in (18b) for 3 people or more is an obvious case of lexical-specification—that is, it requires the speaker to make an arbitrary, idiosyncratic choice of classifier based on number of referents that is specific to lexical items denoting human beings. A similar idiosyncrasy is seen in the sortal classifier for animal referents. The classifier *la'ha-* is used for counting one animal, whereas the classifier *tan-* is used for counting two or more animals. These types of lexically specified constructions further demonstrate a property of the language one would just need to learn.

Other lexically specified classifiers are seen in constructions where classifiers are selected in a semi-arbitrary manner that are not predictable from their semantic or physical properties. For example, the human classifier *cha:'-* is used for counting chili fruits, as in (19a), and the animal classifier *la'ha-* is used for counting muscles as in (19b).

(19) a. cha:'– tin pi'n
CLF:HUMAN– one chili.fruit
'one chili fruit'

b. la'ha– tin skauj
CLF:ANIMAL– one muscle
'one muscle'

The choice of classifier in (19a–b) is not predictable since the classifier *cha:'-* typically appears with human nouns, and the classifier *la'ha-* typically appears with nouns referring to animals. The speaker has no choice in classifier morpheme when counting individual chili fruits or a person's muscles, and the classifier cannot construct reference since, for example, there is nothing human about the chili fruit in the phrase. Furthermore, outside of enumeration, these nouns do not require the classifier construction. Thus, the construction is merely a lexically specified, conventionalized way of counting these nouns.

Another argument for lexically specified classifiers is the presence of a generic, or default, classifier, a common feature of many languages with classifiers. The generic classifier is *a'h-* in UNT and it is used for classifying things that might not fit in other classes. Example (20) demonstrates that the noun *libro* 'book' appears with the generic *a'h-* classifier, rather than one of the more semantically appropriate classifiers like *pe'h-*, the classifier for flat-thin things that is selected by nouns such as papers, letters, documents, and notebooks.

(20)	i'k–	li:–	helh–	tawahá:	wi:lh
	1SG.SUB–	*INST–*	*mouth–*	*practice*	*sit*
	a'h–	tin	libro		
	CLF:DEFAULT–	*one*	*book*		
	'I'm sitting reading one book'				

In (20), the noun *libro* 'book' selects the default (or generic) classifier *a'h-*, rather than some other more predictable classifier. The example demonstrates that it would be difficult to claim that the classifier contributes some semantic specification to an unspecified noun, since the generic classifier is not associated with any particular semantic property. Most human artifacts take the default classifier *a'h-* rather than the expected classifier based on the object's shape or form, which further demonstrates that the classifier does not participate in unitization but is lexically specified.

To further the lexical specification analysis, even mensural classifiers in UNT can be shown to be lexically selected. For example, the classifier *helh-*, grammaticalized from the noun *hélhni'* 'inner mouth,' commonly appears with nouns referring to dates and age, but also mushrooms, pork rinds, and certain flowers. The classifier is also used as a unitizer with the noun *kiní:t* 'meat' in (21).

(21)	puská:t	lak–	tzi'lí	–ma:lh
	woman	*INTNS–*	*fry*	*–PROG*
	helh–	tin	kiní:t	
	CLF:UNEVEN.SURFACE–	*one*	*meat*	
	'The woman is frying a piece of meat.'			

The numeral classifier with *helh-* in (21) is the only way, and the conventional way, to count pieces of meat in UNT. The choice of classifier is not predictable from the meaning of the noun it modifies, since *helh-* is typically used with nouns that refer to dates and time and is not used to count other pieces of foods, for the exception of pork rinds and mushrooms. The classifier is selected in a semi-arbitrary manner that is not semantically predictable, but is rather idiosyncratic and conventionalized. That the noun *kiní:t* is fully specified and does not require the classifier for making reference is demonstrated in (22).

(22) ja: tzey tza'má kiní:t ja: ká'ni'
not *good* *that* *meat* *not* *delicious*
'This meat is no good, it doesn't taste good'.

The noun *kiní:t* 'meat' appears without the classifier construction and makes discrete reference, and therefore, the noun cannot be analyzed as requiring the classifier for semantic specification. The classifier construction is only required when the speaker specifies the number of referents, in which case the choice of classifier is already lexically specified for the construction.

While even mensural classifiers plus noun constructions show strict lexical specification, some classifiers in UNT do participate in unitization in the classic Greenbergian sense. While Greenberg missed out on the sortal versus mensural distinction, he did correctly observe that nouns combined with mensural classifiers contribute a unit necessary for counting the noun, and that speakers may seem to have some choice in classifier construction. In UNT, classifiers that function as sortals merely agree with a semantic property of the lexical referent as in (23a), while mensural classifiers in combination with count nouns seem to force a collective reading of the NP as in (23b) and (23c).

(23) a. pu:lak– tin pi'n
CLF:PLANT– *one* *chili.plant*
'one chili plant'

b. ma'hxpa:– tin pi'n
CLF:ARMFUL– *one* *chili.plant*
'one armful of chili plants'

c. tzan– tin pi'n
CLF:ROLL– *one* *chili.plant*
'one roll of chili plants'

The sortal classifier *pu:lak-* in (23a) with the noun *pi'n* 'chili plant' demonstrates strict lexical specification since the classifier contributes no new information to the noun phrase, but merely agrees with some inherent property of the noun. The mensural classifiers in (23b–c) select a property of the noun that is contingent on the context and not inherent to the meaning of the head noun. There is nothing inherent in the meaning of *pi'n* 'chili plant' which is specified for whether it is in a configuration of the amount that one can hold in their arms or tied up into rolls. In (23b) the classifier *ma'hxpa:-* functions as a mensural classifier because it selects a property of the referent, namely a measure equivalent to an armful, that is contingent on the context of utterance. The classifier may also be used to measure an armful of other things, like fodder, plants, and sticks, but cannot be used to measure an armful of say chili fruits or seeds. Similarly, the mensural classifier *tzan-* in (23c) is used to count rolls or bundles of chili plants, as well as other things like onions or flowers tied at narrow points under their heads, or fans

made out of bunches of branches, but the classifier can not be used for measures of the chili fruit or seeds. In this way, the classifier helps unitize the construction, but the specific classifier used is constrained by the (inherent and contingent) semantic features of the head noun. The classifier constructions in (23b–c) demonstrate classic unitization, in that a change of classifier with the same noun results in a collective reading of the noun and in a change of referent. While there is some freedom in choice of classifier in these constructions, the choice is still constrained by the lexico-semantic properties of the noun and conventionally specified by the language. They are therefore to some degree lexically-specified.

The data further show that some classifier morphemes may have other functions that go beyond Aikhenvald's two-way (sortal or mensural) classification, and Greenbergian unitization. For example, the classifier *pe'h-* which functions as a sortal classifier with nouns that are relatively flat and thin, as was demonstrated in (16), may also appear with plant nouns to refer to the leaf as in (24a), while the plant classifier *pu:lak-* is specified for the plant in (24b).

(24) a. pe'h– tín skukú:jnu'
CLF:FLAT/THIN– one skukú:jnu'.plant
'one skukú:jnu leaf'

b. pu:lak– tín skukú:jnu'
CLF:PLANT– one skukú:jnu'.plant
'one skukú:jnu plant'

In (24a), the classifier *pe'h-* appears with *skukú:jnu'* to make reference to the leaf, and in (24b) the sortal classifier *pu:lak-* for 'plant' is lexically specified for the plant with *skukú:jnu'* 'skukú:jnu' plant'. In fact, the classifier *pe'h-* commonly appears with words for leafy plants in constructions that refer to the leaf. In this case, the classifier *pe'h-* is lexically specified for 'leaf' by which sub-part of the plant is being counted. The classifier *pe'h-* in combination with nouns that refer to leafy plants has been lexicalized to make reference to the leaf.

This function of *pe'h-* is also seen in examples with nouns that refer to books and reading materials, demonstrated by comparing (25a–b).

(25) a. pe'h– tin li:helhtawá'ha'
CLF:FLAT/THIN– one reading.material/book
'a page'

b. a'h– tin li:helhtawá'ha'
CLF:DEFAULT– one reading.material/book
'a book'

The noun *li:helhtawá'ha'* in these two examples is a homophonous noun that refers only to books, magazines, or even very thin pamphlets, but cannot be used to refer to a single page. The classifier *pe'h-* in (25a) in combination with nouns

that refer to books, or reading material, is only used to count the pages. The classifier helps construct the referent by picking out a sub-part of the book, or by selecting the pages of the reading material, but the construction is lexically specified for the 'page'; the speaker has no other option in choice of classifier. The classifier *pe'h-* in some constructions, then, is semantically additive and helps to construct reference, but does not unitize the way mensurals do, rather it selects a sub-part inherent to the noun for which it is lexically specified. In (25b), the generic classifier *a'h-* is lexically specified for counting the book as a whole. While the generic classifier may help disambiguate reference by picking out the book as a referent rather than some other type of reading material, it does not contribute semantic specification to the meaning of the noun, since it is not connected with any particular semantic property. The examples further demonstrate that the classifier is a conventionalized expression that has been lexicalized by the language, which shows that the lexical specification view is also compatible with a view of semantically additive classifiers.

3.2 Neo-unitization: a misanalysis

We have seen that classifiers in UNT exhibit lexical specification. The lexical specification view, however, is in stark contrast with Lucy's neo-unitization view that classifiers semantically modify the meaning of the noun in ways that construct the referent. For Lucy, classifiers are required by the lexico-semantic properties of the noun because nouns are vague or unspecified for discrete features. However, *all* nouns in UNT are actually fully specified in context and it is only nouns combined with classifiers that function like mensurals that participate in unitization. We will show how nouns in UNT are fully specified in semantic terms and how the neo-unitization view is the result of misanalyzing homophonous nouns as being vague. Since nouns in UNT have specific meaning outside of the classifier construction, Lucy cannot claim that the lexico-semantic properties of these nouns require the classifier for unitization. We will also show that while the classifier may help disambiguate between homophonous nouns, context may also serve the same purpose.

Like Yucatec Maya, Upper Necaxa Totonac allows a variety of classifiers to appear with the same lexical noun to make reference to distinct entities in (26a–c):

(26) a. pa:– tin kapéj
CLF:CONTAINER– *one* *coffee.liquid*
'one cup of coffee'

b. pu:lak– tin kapéj
CLF:PLANT– *one* *coffee.plant*
'one coffee plant'

c. a'h– tin kapéj
CLF:ROUND– *one* *coffee.bean*
'one coffee bean'

For Lucy, the noun *kapéj* 'coffee' in (26a–c) would be stored in the mental lexicon as 'coffee-type' for speakers of Totonac and therefore in each case requires unitization. However, accurate glossing of these nouns now makes it apparent that the classifier unitizes the noun in (26a), which denotes a liquid, and agrees with the physical properties of the lexical referents in (26b) and (26c). Now it becomes more apparent that the 'plant' and 'round' classifier do not contribute to the meaning of the NP the same way the 'container' classifier contributes to meaning of the liquid or drink.

Evidence for the claim that *kapéj* is fully specified and unambiguous in context is found in sentences where the noun *kapéj* appears outside of quantification and still results in adequate reference to the plant or bean, such as those in (27a–c):

(27) a. na– i'k– lak– ma:pí: kin– kapéj
FUT– *1SG.SUB–* *INTNS–* *lay.out* *1PO–* *coffee*
xti'kát na– i'k– ska:k –a
petate *FUT–* *1SG.SUB–* *dry* *–IMPF*
'I'm going to lay out my coffee (beans) on a sleeping mat, I'm going to dry it.'

b. na– i'k– x'etí kin– kapéj
FUT– *1SG.SUB–* *crush* *1PO–* *coffee*
xa– pe'h– tin na– wan
DTV– *CLF–* *one* *FUT–* *be*
'I'm going to pulp my coffee (berries), there will be clean beans.'

c. i'x– ta– skuj –ut –ka'n tza'má
3PO– *DCS–* *work* *–NM* *–PL.PO* *that*
chi'xkú' –win ta– cha'n kapéj
man *–PL* *3PL.SUB–* *plant* *coffee*
'The work of the men is to plant coffee (plants).'

The examples in UNT demonstrate that in the absence of the classifier, unambiguous, adequate reference is made to the 'coffee bean' in (27a), the 'coffee berry' in (27b), and the 'coffee plant' in (27c). The noun *kapéj* may be ambiguous outside of context, but the examples in (27a–c) demonstrate that *kapéj* is a fully specified noun whose referent is recovered or disambiguated in context.

Further evidence that bare nouns in UNT are fully specified is seen in the different ways in which the noun *kí'wi'* 'tree' is used in context. The noun *kí'wi'* 'tree' may also appear with a variety of classifiers as seen in (28a–c):

(28) a. pu:lak– tin kí'wi'
CLF:PLANT– one tree
'one plant'

b. hen– tin kí'wi'
CLF:LONG.THIN– one stick
'one stick'

c. kilha'k– tin kí'wi'
CLF:LOAD– one wood
'one load of wood'

In each example, *kí'wi'* 'tree' appears with a different classifier and refers to a distinct object, and would be better glossed as 'tree' in (28a), 'stick' in (28b), and 'wood' in (28c). That these nominals are in fact fully specified outside the numeral classifier construction and still make adequate reference is demonstrated by sentences such as that in (29) where *kíwi'* refers to a 'stick' tied with a balloon at one end. We would expect the classifier *hen-* for long/thin things to appear if the nominal required unitization, but the speaker relies on context instead.

(29) tzáma bómba chi– waka –káni'
that balloon tie– up.high –BEN
nak= i'x– hósni' kí'wi'
LOC= 3PO– tip stick
'The balloon is tied to the tip of the stick.'

Lexical reference is disambiguated by the context of the sentence in (29). For one thing, the speaker used the locative phrase *naki'xhósni'* 'on its tip' because only *kí'wi'* 'stick' has a tip. If the speaker were referring to a balloon tied to the tip of a tree, they would refer to the tree's top as *i'xa'kpú:n* 'its top'. These differences in collocational distributions further indicate that *kí'wi'* 'tree' and *kí'wi'* 'stick' are different words.

In cases of ambiguity, the classifier may help disambiguate lexical reference but cannot be said to construct it. For example, the sentences in (30a–c) were responses to the question 'where is the tree?' using the Topological Relations Picture Series (Bowerman & Pederson 1992) stimulus number 01, a picture of a tree next to a church. The first speaker chose to use the classifier *pu:lak-* for plants in (30a), which may potentially disambiguate the reference of *kí'wi'* had the context been ambiguous. However, the other two speakers did not use the classifier for disambiguation but relied on the context instead in (30b–c).

(30) a. i'x– paxtún pusikwalán ya:lh
3PO- *side* *church* *stand*
pu:lak– tín há'lha' kí'wi'
CLF:PLANT– *one* *big* *tree*
'Next to the church stands one big tree.'

b. i'x– paxtún pusikwalán yá:lh há'lha' kí'wi'
3PO– *side* *church* *stand* *big* *tree*
'Next to the church stands a big tree.'

c. i'x– paxtún pusikwalán ya:lh kí'wi'
3PO– *side* *church* *stand* *tree*
'Next to the church stands a tree.'

Outside of context, the referent of the noun *kí'wi'* in (30b–c) is ambiguous since the verb *ya:lh* could potentially apply to a stick if it were leaning up against the side of the church, or planted upright in the ground. The speakers, however, relied on the context for the purpose of disambiguation and did not need to use the numeral classifier for constructing adequate reference.

Even though the classifier may be used for disambiguation, it is not necessary since context may serve the same purpose. Further evidence in (31a–b) demonstrate that the different nouns *kí'wi'* have distinct semantic distributional patterns, which is evidence that these nouns are in fact distinct, and that outside the classifier construction, they make adequate, non-ambiguous, reference.

(31) a. ta– li:– he:nú: –ya: –nan –lh
3PL.SUB– *INST–* *lean* *stand* *–ST.PL* *–PFV*
lak– hawá'cha'n xa– ta– lak– chú'ku'
PL– *boy: PL* *DTV–* *DCS–* *INTNS–* *chop:NM*
kí'wi'
firewood
'The boys are leaning against (the load of) chopped firewood.'

b. a'kxní na– chin tza'má tapa'hsi:nín
when *FUT–* *arrive.here* *that* *Patla.festival*
chi' i'x– le'h –tu' ma:lhkuyúh
how *3PO–* *CLF:TIME* *–two* *moon*
ta– pu'tzá xa– pu:la'h –lho'hó:' –ho'
3PL.SUB– *look.for* *DTV–* *inside–* *perforated* *–ADJ*
kí'wi'
log
'When it's two months before Carnival, they look for a hollow log.'

In (31a), the noun *kí'wi'* refers to 'firewood' where the unit of measurement or configuration of the noun is implicit, and where the context and the noun

xatalakchú'ku' 'chopped' contributes toward disambiguation, the same way the classifier could have disambiguated the referent. The noun *kí'wi'* also appears without the classifier construction and makes specific reference to a 'log' in (31b), where context and the noun *xapu:la'hlho'hó:'ho'* 'hollow inside' help disambiguate the various meanings of the noun *kí'wi'*. Similarly, (32a–b) demonstrate that the various nouns *kí'wi'* have distinct morpho-syntactic patterns showing that they are different nouns.

(32) a. ka:ná: wilé'hlh –wa' stá'k –li' kí'wi'
truly twisted –SEM grow –PFV tree
'The tree grew very twisted'

b. a'h– tin chik i'x– la kí'wi'
CLF:DEFAULT– one house PST– do wood
'A house made of wood'

In (32a), the noun *kí'wi'* refers to 'tree' and the verb *stá'kli'* 'grew' indicates that the noun is alive. Similarly, *kí'wi'* appears without the classifier construction and makes specific reference to 'wood' in (32b), where in the absence of the numeral classifier, the noun still makes adequate reference. The examples demonstrate that nouns in Upper Necaxa are fully specified, and do not require the classifier morpheme for unitization in constructing adequate reference, since context seems to disambiguate ambiguous reference the same way the classifier might. Furthermore, the examples show that the distinct nouns that *kí'wi'* refers to have different morphosyntactic distributional patterns, demonstrating that they are in fact different nouns. The classifier numeral is not required by the lexical semantics of the noun as Lucy states, and nouns in UNT are indeed fully specified in semantic terms. We, therefore, should use more accurate lexicographic representations of these nouns.

4 Conclusion

The data from Upper Necaxa Totonac challenge Lucy's neo-unitization view that nouns in numeral classifier languages are in some sense lacking in discrete properties by being vague, genotypes, or prototypes. Since most nouns in UNT are fully specified lexical items that appear outside of the numeral classifier construction, Lucy cannot conclude that classifiers are required by the lexical semantics of the noun. The view could only be sustained if these nouns *always* appear in a classifier construction since their lexical semantics require unitization. We demonstrated that the neo-unitization view of nouns results from misanalysing an ambiguous noun as being vague. If this analysis is true for Upper Necaxa, then it may well be true for other languages, including Yucatec where nouns do not always appear within the numeral classifier construction either (Lucy 1992 & 2014), or when nouns are counted with numerals of Spanish origin, an observation also noted by Lehmann (2008).

Although we have shown that the classifier system in Upper Necaxa Totonac is largely lexically specified, that does not mean the system is semantically empty. Classifiers that function like sortals are strictly lexically specified by demonstrating obligatory agreement with an inherent semantic property of the noun, and never semantically adds to the meaning of the noun. Mensural classifiers select properties of the noun that are contingent on context and may help construct and unitize the expression, but they also form constructions that are specified by semantic properties of the referent noun, and constructions that have been conventionalized in practical and social/cultural ways where the speaker does not have a choice in classifier construction. Classifiers may also help disambiguate homophonous sets of nouns if context is not enough, which demonstrates that there is some kind of dependent relationship between the classifier and noun, and that speakers cannot freely chose the classifier for the construction it appears in. Additionally, numeral classifiers may serve other pragmatic and rhetorical functions that are rather unusual and pragmatically marked, which demonstrates that there is some flexibility in the system that, at times, is constrained by the semantic properties of the head noun, but not entirely restrained by it. For these reasons, the classifier system in Upper Necaxa Totonac, in general, is lexically specified. The analysis also implies that a view of lexically specified classifiers is compatible with a system of classifiers that are semantically additive and demonstrate unitization in the classic sense.

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Appendix A

Classifier	Source Noun	Body-part origin	Prototypical semantic extension
a'h-	*a'han*	head	default; round objects
cha:-	*cha:n*	shin	human (1-3 persons); chilies, seeds
helha-	-	-	human (3+ persons)
la'ha-	*lakán*	face	animal (1-2 animals)
tan-	*táni'*	buttocks	animal (2+ animals)
pu:lak-	*pu:-lákni'*	vagina-leg	plants
he:-	*he:n*	back	upright bulky/cylindrical
hen-	*hé'ni'*	penis	long/thin
pe'h-	*pé'hni'*	branch	flat/thin
a'kpu:-	*a'kpú:n*	crown of head	upper surface
mak-	*makni'*	body	bulky hefty things
he:sti-	*he:-sti:n*	back-long/thin	bunch-plant
kilhmak-	*kilh-mak-*	mouth-body	small bunch
mus-	-	-	full bunch
pix-	*pixni'*	neck	roll/bunch
tzan-	*tzani'*	thick end	roll/bundle/bunch
ma'xhpa:-	-	-	armfuls
tu:-	-	-	price
tapa:-	*ta:pá:n*	side of the body	loads/armfuls
helh-	*hélhni'*	inner mouth	uneven irregular surface
laka-	*lakán*	face	places, locations
a'k-	*a'hxa:h*	head	outer covering; clothes
pu:-	*pu:n*	vagina	garments; clothes
pa:-	*pa:n*	belly	containers
ho'x-	-	-	money
ma'h-	-	-	time
le'h-	-	-	dates
hempa-	-	-	time/ type