The DP-adjoined plural in Yucatec Maya and the syntax of plural marking[*]

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1 Introduction

In this chapter, I present a formal analysis of the nominal plural marker in Yucatec Maya in a Minimalist/Distributed Morphology framework. First, I discuss some interesting cross-linguistic variation in the morphosyntax of plural marking. I discuss how this variation has triggered important theoretical debates about nominal denotation and the nature of nominal arguments as well as number features and agreement. I also mention some variation that is still unaccounted for. Following that, I discuss the basics of the DP in Yucatec Maya. I discuss what elements reside in the DP and what their

syntax is. Based on those assumptions, I present arguments for the analysis of the Yucatec Maya nominal plural marker as adjoined to the Determiner projection. This analysis of Yucatec Maya fits into Wiltschko (2008)'s formal syntactic typology of plural marking and expands the empirical coverage of the typology.

2 The typology of number marking

Number is inflectional and obligatory on countable nouns in many well-known Indo-European languages. In these languages, there is often number agreement within the noun phrase (concord) and between nominal and verbal elements. The examples in (1) through (4) below show that in Spanish, there is obligatory concord for number between the determiner and noun and there is obligatory number agreement between the noun and the verb.

(1) Las   muchach-as est-án   cant-ando
    DEF.FEM.PL girlFEM.PL be-PROG.3.PL sing-GER
    'The girls are singing.'

(2) *Las   muchach-a est-án   cant-ando
    DEF.FEM.PL girl-FEM.SG be-PROG.3.PL sing-GER
    'The girls are singing.'

(3) *La   muchach-as est-án   cant-ando
    DEF.FEM.SG girl-FEM.PL be-PROG.3.PL sing-GER
    'The girls are singing.'

(4) *Las   muchach-as est-á   cant-ando
    DEF.FEM.PL girl-FEM.PL be-PROG.3.SG sing-GER
    'The girls are singing.'

In the example in (1), the determiner and noun match in plural form along with the noun and the verb. The example in (2), however shows that a sentence in which the determiner is in the plural form while the noun is in the singular form is ungrammatical. Likewise, the example in (3) shows that a singular determiner with a plural noun is ungrammatical, even if the noun and verb match, both having a plural form. Finally, the example in (4) shows that even if there is concord between the determiner and noun,

which show the same plural forms, the sentence is ungrammatical because the plural form of the nominal does not match the singular form of the verb. Number concord within the noun phrase and agreement between the nominal and verbal elements is obligatory in Spanish.

In many other languages, however, number is not marked, optional, or conditioned by syntax-external factors, such as the animacy of the noun (Corbett, 2000; Mithun, 1999). In Yucatec Maya, plural marking in the noun phrase is not necessary for a noun to be interpreted as referring to a plurality, as shown in (5).

(5) le   x-ch'úupal-o'
    DEF FEM-girl-DIST
    'the girl (there)' / 'the girls (there)'

There are other aspects of number marking in Yucatec which present empirical challenges for some common approaches to number marking. In the next section, I will investigate more of the typological variation in plural marking as it relates to theoretical debates about the syntax of number, the function of number marking, nominal denotation and nominal argumenthood and number features and number agreement.

3 Theoretical issues

There is a wealth of literature on the semantics of bare nouns, genericity and the mass/count distinction (especially since Carlson (1977)), but there has been less research into the morpho-syntax related to these issues. In the next sections, I discuss these issues, even though I will not be able to propose conclusive solutions to all of them.

3.1 Number Phrase

The generally accepted analysis of plural morphology in the DP is that it occupies the head of a functional projection, called Number Phrase or #P. This analysis has been well established cross-linguistically for languages such as Hebrew (Ritter, 1991, 1992), Romance (Bernstein, 1993), Arabic (Fassi-Fehri, 1993; Zabbal, 2002), Welsh (Rouveret, 1994), English (Embick and Noyer, 2007), Chinese (Li, 1999, who re-analyzes the collective morpheme -*men* as a plural marker) and Kiowa (Harbour, 2007), among others. Some

languages, however, have been argued to lack a Number Phrase completely (Ghomeshi, 2003, for Persian) (Deprez, 2005, for Hatian) (Kwon and Zribi-Hertz, 2004, for Korean). Lacking a Number Phrase has been connected to the absence of agreement for number (Kwon and Zribi-Hertz, 2004) (but see Wiltschko (2009) for an alternative proposal under which a language could have number agreement without a Number Phrase). Additionally, some languages have been proposed to have plural morphology which resides is some phrase other than NumP, for example, $\sqrt{}$P (Wiltschko, 2008, for Halkomelem Salish), nP (Kramer, 2009, for Amharic irregular plurals) and (Gillon, in prep., for plural marking in Innu-Aimun) and D/QP (Ghomeshi, 2003, for Persian), but see (Gebhardt, 2009, for arguments against this analysis).

I argue that the plural marker in Yucatec Maya is adjoined to the DP, based the syntactic typology of plural marking Wiltschko (2008). I do not take the position that because the plural marker resides in DP, the language lacks a NumP. It may be possible that NumP is the phrase which hosts a numeral classifier. Also, there may be evidence from N-movement to believe that Yucatec Maya does in fact have a NumP. I discuss these issues more in Section 5.

3.2 Nominal denotation

What do bare nouns denote? Is the mass/count distinction lexically based or derived in the syntax? There is increasing evidence for the position that the mass/count distinction is rather elastic (Chierchia, 2010). There are many nouns that appear in mass and count contexts alike (e.g. *much hope*, *many hopes*) (Katz and Zamparelli, 2011, who present a a large-scale quantitative distributional analysis of mass/count in English).[1] If these analyses are on the right track and the mass/count distinction is not lexically-based (as argued by Chierchia (1998)) but a syntactically derived phenomenon. It brings the analysis of languages such as English much closer to languages with classifiers, in which the mass/count distinction is argued to be absent at the lexical level and necessarily derived in the syntax. If the mass/count distinction is derived through the syntax, as argued by Borer (2005), then the role of the Number Phrase is increasingly important. Borer (2005) proposes that a Classifier Phrase is responsible for individuation of stuff into countable enti-

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[1]See also Barner and Snedeker (2005); Barner et al. (2008) for evidence from psycholinguistic experiments that individuation of countable nouns is derived from the syntax.

ties in all languages, but languages vary as to what lexeme fills that position, plural marking or a classifier. There are a number of languages which present empirical problems for any theory which rigidly rules out the co-occurence of plural morphology and classifiers, such as Borer (2005); Chierchia (1998); Sanches and Slobin (1973). Plural marking and classifiers co-occur even within the same phrase, in Yucatec Maya. This phenomenon can be found in elicited examples, as in (6), as well as in narratives, examples (7) and (8).[2] [3]

(6) ka'a-túul   x-ch'úupal-o'ob
    two-CL.AN FEM-girl-PL
    'two girls'

(7) óox-p'éel   ja'ab-o'ob
    three-CL.IN year-PL
    'three years' (Blair and Vermont-Salas, 1967, 454)

(8) le   óox-p'éel   siidra-o'ob-o'
    DEF three-CL.AN cider-PL-DIST
    'the three ciders' (Andrade and Máas-Collí, 1999, 216)

Plural marking and classifiers have been shown to co-occur within the same phrase in Persian as well (Gebhardt, 2009) (and Karimi, pc.). Examples are shown in (9) and (10).

(9) se   ta gorbe-ha
    three CL cat-PL
    'three cats' (Gebhardt, 2009, 20)

(10) un   do ta mænzel-ha
     DEM two CL house-PL
     'those two houses' (Gebhardt, 2009, 75)

Classifiers co-occur with plural morphology in a number of other Mayan languages as well. In Jakaltek Maya, the plural morpheme co-ocurrs with numeral and noun classifiers. The plural morpheme *heb'* used for nouns

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[2]These examples are not partitives. In Yucatec the partitive has a definite determiner between the numeral-classifier and noun, e.g. *ka'a-túul **le** x-ch'úupal-o'ob* (two-CL.AN DEF FEM-girl-PL) 'two of the girls.' I thank Scott AnderBois for this question.

[3]I thank Judith Aissen for the suggestion to look for examples in narratives.

referring to humans, as in (11), co-occurs with the numeral classifier *waň* as well as the noun classifier *naj*. Likewise in (12), the plural morpheme *hej*, used for nouns referring to animals, co-occurs with the numeral classifier *c'oň* and the noun classifier *no7*.[4]

(11) ca-waň   heb'   naj   winaj
     2-CL.NM.HUMAN PL.HUMAN CL.N.MAN man
     "the two men"

(12) ca-c'oň   (hej)   no7   nok'
     2-CL.NM.ANIMAL PL.ANIMAL CL.N.ANIMAL animal
     "the two animals" (Craig, 1986, 15)

If the DP-adjoined nominal plural analysis, which I present in this chapter, is correct, it suggests one way in which plural morphology and classifiers can co-occur, if the plural resides in a phrase other than Number/Classifier phrase. Another possibility is if there are two separate functional phrases, NumP and ClassifierP, as argued for Persian by Gebhardt (2009).

In addition, there are a variety of languages in which plural marking is somewhat freely applied to mass nouns, such as Korean (Kwon and Zribi-Hertz, 2004), Lillooet Salish, (Davis and Matthewson, 1999), Innu-aimun (Gillon, in prep.) and Ojibwe (Mathieu, submitted). And, there are languages in which plural morphology can have double exponence, such as Amharic (Kramer, 2009), Somali (Lecarme, 2002) and Arabic (Zabbal, 2002). These cases support the idea that individuation is a function that is related to the syntactic representation, rather than something that is lexically marked for a subset of countable nouns.

3.3   Nominal arguments

Closely related to the issue of nominal denotation is the issue of nominal arugmenthood. Some languages allow bare nouns as arguments, e.g. Mandarin (Cheng and Sybesma, 1999), while others do not, e.g. English which requires determiners on referential nominal arguments.

Chierchia (1998) proposed a semantic parameter that predicts how languages can vary in terms of what bare nouns denote and if they can appear

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[4]Another interesting aspect of Jakaltek grammar is that there are numeral classifiers as well as noun classifiers which co-occur along with plural marking. I leave this for future research.
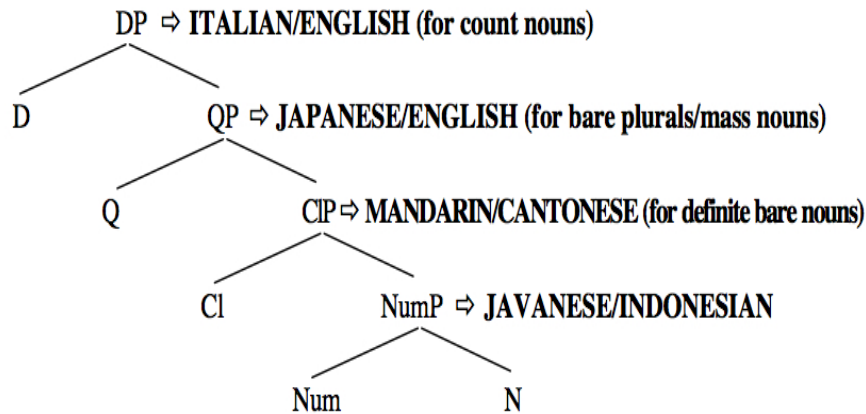
as arguments. Chierchia proposes two semantic features, [± arg(ument)] and [± pred(icate)], that govern the way in which the syntactic category N is mapped onto its LF interpretation. There are three mapping possibilities: kinds, properties or mixed (with features of both kinds and properties). In a [+arg] [-pred] language, such as Chinese and Japanese, bare nouns are mapped onto kinds, which are functions from worlds to pluralities (type $< e >$). This language type will display three major morphosyntactic properties that follow from the settings of the two semantic features: 1) They allow bare noun to be arguments, 2) They lack plural morphology (since kinds are the neutralization of the singular/plural distinction) and 3) They have a generalized classifier system that functions to individuate nouns. On the other hand, a [-arg] [+pred] language maps bare nouns onto properties. These languages, such as French and Italian, do not allow bare nominal arguments, but arguments much combine with a determiner to be morphosyntactically licensed. A final type of language, [+arg] [+pred], is mixed and maps bare arguments to kinds for mass nouns and bare plurals and to properties for count nouns. This explains why in English count nouns require determiners but mass nouns and bare plurals are licensed without determiners.

We have enough facts already about Yucatec Maya already to predict that it would be a [+arg] [-pred] language in Chierchia's theory. Yucatec would be expected to be of the same type as Chinese and Japanese because it is a language that has obligatory numeral classifiers. There is however, one glaring problem: Yucatec allows classifiers to co-occur with plural morphology, even within the same phrase. Chierchia's proposal has been convincingly argued to be far too rigid (Cheng and Sybesma, 1999; Chung, 2000; Sato, 2008; Gebhardt, 2009, *inter alia*).

An alternative to Chierchia's proposal is that the syntax requires nouns to have some minimal amount of functional structure in order to be an argument. Rather than some semantic requirements, as Cheirchia proposes, there is a potential syntactic explanation for the distribution of nominal arugments. Some argue that in order for nouns to function as arguments, there has to be some content in D or some movement to D (Szabolcsi, 1987; Stowell, 1989; Longobardi, 1994; Progovac, 1998, *inter alia*). There are arguments that nominal arguments can be DPs or NumP, e.g. in Mandarin (Li, 1998). Sato (2008) proposes a universal nominal morphosyntactic hierarchy, shown in (13) in which languages vary according to how much functional structure they require of their nominal arguments, based on previous proposals by Grimshaw (1990, 2005); Massam (2001); Guilfoyle and Noonan (1992);

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Vainikka (1993/1994). His proposal also varies as to what number values a language has available in Num: singular and plural or neutral and plural.

(13) Universal nominal morphosyntactic hierarchy (from Sato (2008))

DP ⇨ **ITALIAN/ENGLISH (for count nouns)**

D   QP ⇨ **JAPANESE/ENGLISH (for bare plurals/mass nouns)**

Q   ClP ⇨ **MANDARIN/CANTONESE (for definite bare nouns)**

Cl   NumP ⇨ **JAVANESE/INDONESIAN**

Num   N

Sato argues that English has three possible sets of number values, singular, plural and neutral, and requires nominal arguments to have a QP or DP. Indonesian and Javanese, in contrast, have only the number values neutral and plural, and they only require nominal arguments to be NumPs. These parameters, he argues, explain the differences in nominal denotation and nominal arguments across these languages.

This is a promising proposal, attributing differences in nominal denotation and nominal argumenthood to morhposyntactic, rather than semantic, parameters, but it still faces empirical problems when more cross-linguistic data are considered. Sato's proposal, like those of Chierchia (1998) and Borer (2005) predicts that number marking and classifiers are mutually exclusive categories. Sato states: "The individuation function encoded by the singular value of the {singular, plural} set has the same function as that encoded by the classifier. Under the theory that semantic composition is computed in the bottom up fashion in a strictly local manner, the projection of the NumP with the relevant values makes the projection of the dominating ClP redundant." (Sato, 2008, 284). Sato's proposal is on the right track, I believe, in postulating a morphosyntactic parameter and also in assuming a feature valuation relation between the Num head and its complement n. In the next section, I discuss the feature representation and valuation mechanism that I assume.
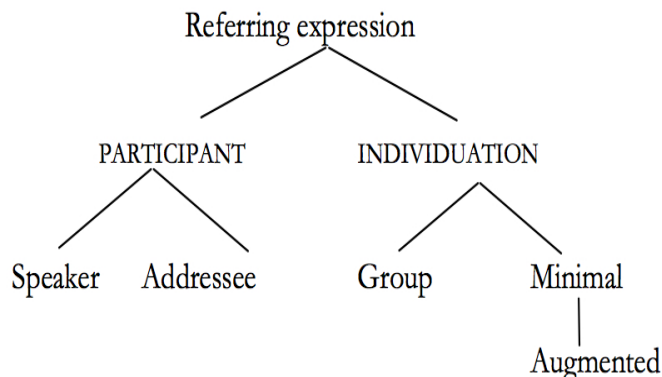
3.4 Number features

Another question related to number marking is the details of feature specification. Some languages appear to have a singular/plural distinction, like English and Spanish, while other have a general/plural distinction, like Yucatec Maya. General number can be described as a lack of specification for number, and it is cross-linguistically common (Corbett, 2000). In a language with general number, like Yucatec, a noun which is not marked with plural morphology can still be interpreted as referring to a plurality. The interpretation of general number and the optionality of plural marking in languages with general number seems to suggest that when the plural marker is not present, the noun phrase in unspecified for number. That is to say when the plural morpheme is present, some morpho-semantic feature is present, but when the plural morpheme is absent, there is no singular-denoting feature present, such as a [singular] or [-plural] feature. There is even cross-linguistic psycholinguistic evidence to suggest that there is no singular or [-plural] feature present in singular noun phrases, even for languages with a singular/plural distinction, while there is a [plural] feature present in plural noun phrases. Number agreement attraction has been shown to take place only when a local distractor noun is plural and not singular (Bock and Miller, 1991; Bock and Eberhard, 1993; Eberhard, 1997; Fayol et al., 1994; Vigliocco et al., 1996). Berent et al. (2005) showed that speakers of Hebrew were susceptible to a Stroop-like effect regarding morpho-semantic number features. When participants had to say how many strings (of letters) were on screen, they took longer to indicate that there was just one string when it had plural morphology, but they did not take longer to indicate that there were two strings when neither string had plural morphology.

These findings suggest that even for speakers of English and Hebrew, for whom number agreement is obligatory, there may not be a singular or [-plural] feature present in singular noun phrases. These findings are quite compatible with the theory of person and number features presented by Harley and Ritter (2002). Harley and Ritter (2002) propose that person and number features are arranged hierarchically. The diagram in (14) shows that the presence of the feature [GROUP], which triggers insertion of a plural form, is dependent on the presence of a feature [INDIV], which implies individuation of the nominal referent. Notice that there is no singular feature which alternates with the plural [GROUP] feature. A singular noun phrase is not as highly specified as a noun phrase with a plural feature. But, there is still a feature which implies

that the noun phrase, though under-specified for number, is individuated into countable entities.

(14) Person/number feature geometry (adapted from Harley and Ritter (2002))

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                        Referring expression
                        /              \
                PARTICIPANT          INDIVIDUATION
                /        \            /          \
          Speaker    Addressee    Group        Minimal
                                                  |
                                              Augmented
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If we adopt this system of number features, the result is a simpler and more economical representation than assuming three distinct features (e.g. singular, plural and neutral). General number and singular number are both the result of the presence of the [INDIV] feature, while plural number is the result of [INDIV]-[GROUP]. This analysis is especially appealing since there is growing psycholginguistic evidence which brings into question the psychological reality of a morpho-syntactic feature for singular nouns.

3.5   Number agreement

I assume that in the nominal domain, there would be a probe on D^0 which would have an uninterpretable, unvalued [INDIV] feature. I depart from Sato (2008) in assuming that the number feature probe is on D, rather than Num). The probe on D^0 searches its domain to find either a singular noun phrase, with the [INDIV] feature or the plural morpheme -*o'ob* which has an [indiv] feature along with a more specified dependent feature [GROUP], as diagrammed in (15).

(15) $D^0_{[INDIV]}$ ... -PL$_{[INDIV]-[GROUP]}$

I also assume, along the lines of Pesetsky and Torrego (2007, 2004) that feature matching and feature valuation are two separate steps in the *Agree*

operation. The [INDIV] feature on D is unvalued, and thus triggers a probe to search for a matching goal in its domain. When the probes finds the [INDIV] feature in its search domain (of a non-plural marked noun), the feature is matched and deleted before being sent to LF, where an uninterpretable feature will make the derivation crash. On the other hand, when the probe finds the [INDIV]-[GROUP] feature (of a plural marked noun), it finds a match with the interpretable [INDIV] feature, and it also gets valued by the dependent [GROUP] specification of the [GROUP] feature. These assumptions are able to capture the fact that in Yucatec Maya, nouns which are unmarked for plural can be interpreted as referring to a plurality, but the reverse is not possible. In Chapter 3, I will examine more closely the DP-internal agreement processes along with clausal number agreement.

In this chapter, I examine the distribution and interpretation of noun phrases with the plural marker -o'ob in Yucatec Maya. I argue that this plural marker in the nominal phrase is adjoined to the Determiner projection, not at the Number Phrase. If this analysis is on the right track, we can recover the generalization of complementary distribution between plurals and classifiers as proposed by Borer (2005). We can also formalize the intuition of Greenberg (1963) and Chierchia (1998) when they claimed the complementarity of plurals and classifiers to hold, at least for plural marking in the familiar Western/European sense. This means that the complementary distribution of plural marking and classifiers is essentially syntactic. Plurals and classifiers may not both reside in NumP. If plural marking is in the DP, as I argue for Yucatec Maya, then plural marking and classifiers may co-occur, even within the same phrase.[5] I incorporate this analysis into a formal typology of the syntax of plural marking (Wiltschko, 2008), and I argue that this analysis of Yucatec Maya expands the empirical coverage of Wiltschko (2008) showing distributional and interpretational evidence for a DP plural. Also, I provide arguments that though the plural morpheme does not reside in NumP, the language does not lack that projection.

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[5]This analysis leaves open the possibility that a language can have a Classifier Phrase in addition to a Number Phrase, as Gebhardt (2009) argues for Persian. This is another potential explanation for the co-ocurrence of plurals and classifiers.

4 Plural marking in Yucatec Maya

In this section, I describe some basic properties of plural marking in Yucatec Maya. I show how neither number concord nor agreement (at least for verb-initial clauses) are obligatory. I outline the distribution of the plural marker with respect to other elements of the DP, and I outline the structure of the DP that I assume for Yucatec Maya. In the following sections, I introduce the syntax of plural marking (Wiltschko, 2008), a typology of plural marking, which I adopt to show that the nominal plural marker in Yucatec Maya is adjoined to the DP.

4.1 No obligatory agreement

Plural agreement between nominal and verbal elements is not obligatory, at least not for the predicate-initial sentences presented here (In Chapter 3, I develop a theory of constituent order and agreement in Yucatec). The sentence in (16) without plural morphology on the noun or the verb can still be interpreted as referring to a plural argument.

(16) Táan u   k'aay le   x-ch'úupal-o'
     PROG A3 sing   DEF FEM-girl-DIST
     'The girl is singing.' / 'The girls are singing.'

The noun phrase can be marked with plural morphology, and there is no requirement for the verb phrase to co-vary in form. The example in (17) shows that the noun phrase can be plural-marked while the verb phrase is not, at least when the verbal complex is initial.[6] A sentence with plural marked on the noun and verb, as in (18) is grammatical as well.

(17) Táan u   k'aay le   x-ch'úupal-o'ob-o'
     PROG A3 sing   DEF FEM-girl-PL-DIST
     'The girls are singing.'

(18) Táan u   k'aay-o'ob le   x-ch'úupal-o'ob-o'
     PROG A3 sing   DEF FEM-girl-PL-DIST
     'The girls are singing.'

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[6]In Chapter 3 I examine number agreement and constituent order. Agreement has different properties in alternative constituent orders. For the moment, I will leave it aside to focus on the nominal plural.

A sentence with a plural-marked verb but no plural marking on the noun is grammatical as well, as in (19).[7]

(19) Táan u   k'aay-o'ob le   x-ch'úupal-o'
PROG A3 sing   DEF FEM-girl-PL-DIST
'The girls are singing.'

Similarly, number concord within the noun phrase is not obligatory in Yucatec. The example in (20) shows that the prenominal adjective is not in a plural form, while the noun is.

(20) le   ki'ichpam x-ch'úupal-o'ob
DEF pretty   FEM-girl-PL
'the pretty girls'

In fact, plural marking on a prenominal adjective is judged by native speakers as ungrammatical, as shown in (21). When the adjective is in postnominal position, however, as in (22), it can take the plural marker, a curious fact that I will return to in Section 7.2.

(21) *le   ki'ichpam-o'ob x-ch'úupal-o'ob
DEF pretty-PL   FEM-girl-PL
'the pretty girls'

(22) le   x-ch'úupal-o'ob-o' ki'ichpam-o'ob
DEF FEM-girl-PL-DIST   pretty-PL
'the pretty girls'

In the next section, I present a description of the elements in the DP in Yucatec Maya in order to argue for an analysis of the nominal plural marker as adjoined to the Determiner projection. In Chapter **??**, I present a proposal for the syntax of the plural marker in the verbal domain along with an analysis of number agreement and constituent order in Yucatec.

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[7]Some speakers report a slightly different interpretation for a sentence that is verb-intial and has plural marking on the verb but not the noun. The interpretation of (19) has been reported by one speaker to mean "They are singing with the girl." I leave this issue for future research.

4.2   The distribution of the nominal plural marker

In this section, I examine the distribution of the plural marker with respect to other elements of the noun phrase. Here, I describe the co-occurrence of the plural marker with the determiner. Then, I examine the co-occurrence of the plural marker with the phrase-final particles and classifiers.

4.3   Determiner

The plural marker in Yucatec Maya can occur with the definite determiner, as in example (23), and the definite determiner can occur without the plural, as in (24). Likewise, the plural marker can occur without the determiner as in (25) and (26).

(23) le   x-ch'úupal-o'ob
      DEF FEM-girl-PL
      'the girls'

(24) le   x-ch'úupal
      DEF FEM-girl
      'the girl' / 'the girls'

(25) x-ch'úupal-o'ob
      FEM-girl-PL
      'girls'

(26) kaax-o'ob
      chicken-PL
      'chickens' (Tec-Tun et al., 2003, 184)

When the plural marker occurs without a definite determiner, it results in a generic or kind interpretation. The bare plural nouns in (27) and (28) refer to the generic noun "red hammocks" or to a kind "women."

(27) Juan-e'   k-u-meent-ik   chak k'áan-o'ob
      Juan-TOP IMPF-A3SG-do red   hammock-PL
      'As for Juan, he makes red hammocks.' (Tonhauser, 2009, 4)

(28) Ko'lel-o'ob-e'   ma' táan u   bin-i'
      woman-PL-TOP NEG PROG A3 go-D4
      'Women don't go there.' (Verhoeven, 2007, 105)

4.4 Phrase-final particles

In addition, the plural marker can be used with the three particles that occur in the final position of the noun phrase in Yucatec Maya. The phrase-final particles include the distal decitic marker -o', shown in (29), the proximal deictic marker -a', shown in (30), and the topic marker -e', shown in (31). The plural marker can co-occur with any of these phrase-final particles.[8]

(29) le   x-ch'úupal-o'ob-o'
     DEF FEM-girl-PL-DIST
     "the girls (there)"

(30) le   x-ch'úupal-o'ob-a'
     DEF FEM-girl-PL-PROX
     'the girls (here)'

(31) le   x-ch'úupal-o'ob-e'
     DEF FEM-girl-PL-TOP
     'as for the girls'

4.5 Classifiers

In Yucatec Maya, numeral classifiers are obligatory when a noun is enumerated. There are three very common classifiers, -túul used to count animate entities, -p'éel used for counting inanimate entities, and as a general classifier, and -kúul used for counting for plants. There are over 250 classifiers documented by Miram (1983). Some are "massifiers" in the terms of Cheng and Sybesma (1999) which measure out mass nouns, and some classifiers indicate shape, material or time. The most interesting property for the current analysis is that numeral classifiers can co-occur with plural markers. This phenomenon can be found in elicited examples and in narratives. These examples were introduced in Section 3.2 and are repeated here in (32), (33) and (34).

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[8]The phrase-final particles are glossed by Mayanists as D2 - distal deictic particle, D1 - proximal deictic particle and D3 - topic particle, but I am using the labels DIST for the distal particle, PROX for the proximate particle and TOP for the topical particle, for readability.

(32) ka'a-túul   x-ch'úupal-o'ob
     two-CL.AN FEM-girl-PL
     'two girls'

(33) óox-p'éel   ja'ab-o'ob
     three-CL.IN year-PL
     'three years' (Blair and Vermont-Salas, 1967, 454)

(34) le   óox-p'éel   siidra-o'ob-o'
     DEF three-CL.AN cider-PL-DIST
     'the three ciders' (Andrade and Máas-Collí, 1999, 216)

5   DPs in Yucatec Maya

5.1   The syntax of DP elements in Yucatec Maya

In Sections 4.2 through 4.5, I examined the co-occurrence of the plural marker
with other elements of the noun phrase, the determiner, phrase-final particles
and numeral classifiers. In this section, I outline a number of assumptions
about the the syntax of these elements.

It has long been argued that determiners head a Determiner phrase, which
is the functional head of a nominal phrase, rather than the nominal, lexical
constituent (Abney, 1987; Brame, 1982; Szabolcsi, 1983). At this prelim-
inary juncture, I see no arguments against the proposal that the definite
determiner in Yucatec Maya is the head of the determiner phrase. I fol-
low Karimi1989,Gebhardt2009 in assuming that numerals are weak quan-
tificational elements that head a (Weak) Quantifier phrase in the nominal
domain. It has been argued that classifiers head their own functional pro-
jection, a classifier phrase (ClP) Borer (2005); Simpson (2005); Cheng and
Sybesma (1999). For Borer (2005) the NumP and ClP are the same, but
Gebhardt (2009) argues that languages can have both a NumP and a ClP.

For Yucatec Maya, it is possible that the classifier heads the Num/ClP.
Currently, I have no evidence to distinguish the two accounts. The numeral
classifier is obligatory with a numeral (except for those borrowed from Span-
ish). It is also possible that the classifier is base-generated as the head of
the quantifier phrase, with the numeral in the specifier of the same phrase,
since the numeral classifier appears to b selected by the numeral, though it
reflects properties of the noun. If the classifier heads the Num/ClP, then we

might expect it to license bare noun-classifier arguments, but in Yucatec it does not.[9] It is also possible that the classifier head-adjoins to the numeral in QP, or that it heads the QP, with the numeral in Spec-QP. This analysis has potential, because a classifier is also obligatory with certain quantificational elements, as shown in (35).

(35) Jay-*(túul)   péek' yaan waye'?
     how.many-CL.AN dog   exist there
     'How many dogs are over there?'

No matter what the best analysis of the syntax of the numeral classifier in Yucatec is, suffice it to say that if the classifier resides in the Number Phrase domain, it would support the idea that the plural marked resides elsewhere (DP). Even if the correct analysis of the numeral classifier in Yucatec is that it resides in the QP, there are other arguments that Yucatec still has a Number Phrase as a necessary landing site for N-movement (and if the classifier is in Q, then this is certainly possible).

I argue that the phrase-final deictic particles function as case-licensors. In this case, I they head the Kase projection, which dominates the DP (Loebel, 1994; Lagmontagne and Travis, 1986). Some evidence for the phrase-final deictic particles as heads of K in Yucatec is that pre-verbal nominal phrases must be marked with the phrase-final deictic particle to be interpreted as arguments. The clause in (36) with the deictic particle is interpreted as the agent/sbject of the clause. When no deictic particle is present, the same nominal phrase is interpreted as being a noun with a relative clause modifier (37).

(36) Le   xi'ipal-o' k-u   jaant-ik ja'as
     DEF boy-DIST IMPF-A3 eat-INC banana
     'The boy is eating bananas.'

(37) Le   xi'ipal k-u   jaant-ik ja'as
     DEF person IMPF-A3 eat-INC banana
   'the boy who is eating bananas'

Based on these observations about the syntax of the basic elements of the determiner projection in Yucatec Maya, I propose the preliminary structure

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[9]I thank an anonymous *Lingua* reviewer for this point.

in (38). In the following sections, I will argue that the plural marking in the nominal domain in Yucatec Maya is adjoined to the level of D. Thus, in the structure below, the plural appears in its proposed position. (I use #P to refer to the possibility that this phrase is a NumP or a ClP, which Borer proposes to be one in the same phrase, ClP. I leave open the possibility discussed above that the classifier is in QP with the numeral.)

(38) Structure of Yucatec Maya determiner phrase
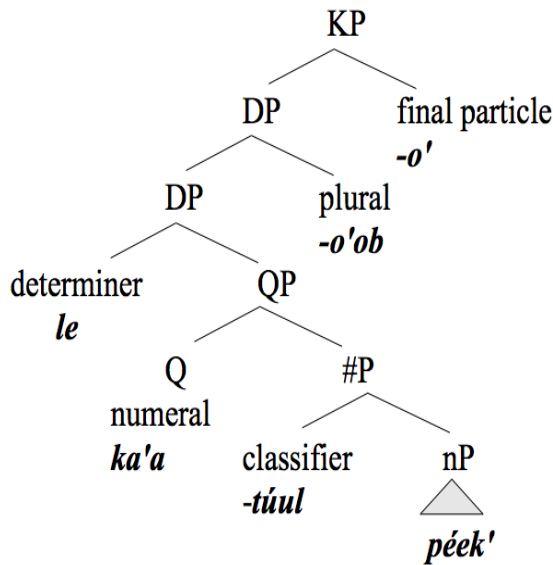
In the next section, I present Wiltschko (2008)'s syntactic typology of plural marking, a basis for my arguments for the nominal plural marker in Yucatec as adjoined to the DP.

6 The syntax of plural marking

As we have seen, in many languages, plural morphology has been shown to head a Number Phrase within the Determiner Phrase domain. This analysis has been argued to be inadequate to capture the distributional and interpretational facts of plural marking in other languages.(Li, 1999; Ghomeshi, 2003; Wiltschko, 2008; Gillon, in prep.; Kramer, 2009). Halkomelem, for example, has been shown to be a language in which plural morphology merges as a syntactic modifier to an acategorial root (Wiltschko, 2008). Wiltschko

(2008) shows evidence that plural marking is optional and does not trigger agreement, and that it should be considered a syntactic modifier (an adjunct). Wiltschko (2008) argues that the fact that plural morphology in Halkomelem can occur inside of compound nouns and inside of derivational morphology is evidence that it cannot merge as high as NumP (which Wiltschko calls #P), but rather that it adjoins to an acategorial $\sqrt{}$ root. Wiltschko (2008) proposes a typology of plural marking in which plural marking can vary cross-linguisticall in how the plural is merged and where the plural is merged. Plural morphology can be merged either as a head or as a syntactic modifier (an adjunct), summarized in Section 6.1. Also, plural morphology can be merged at various levels of the DP, including DP, NumP, nP and $\sqrt{}$root, outlined in Section 6.2.

6.1 How plurals merge

The first aspect of the parametric variation that is possible in the syntax of plural marking is how plurals merge. Plurals can merge as the head of a phrase, whereby changing the syntactic category of the noun with which it merges to Number, depicted in (39). Other plurals do not have the category-changing potential. They merge as modifiers without the ability to change the category of the element with which they merge, as in (40). If a plural merges as a modifier to n, for example, the phrasal category remains nP with an adjoined number category (Wiltschko, 2008).

(39) Plural merges as head (adapted from Wiltschko (2008))
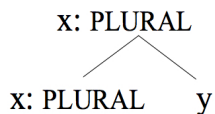
x: PLURAL
├
x: PLURAL   y

(40) Plural merges as modifier (adapted from Wiltschko (2008))

y
├
PLURAL   y
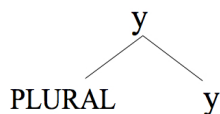
I assume, following Wiltschko (2008); Hornstein and Nunes (2008); Sato (2010), that adjuncts are syntactic objects that merge without the ability to change the category label of the item with which they merge. Hornstein

and Nunes (2008) propose that specifiers and complements require concatenation and labeling, while adjuncts require only concatenation. A suggestion along these lines was also mentioned by (Wiltschko, 2008, footnote 13). The variation in the merging of plural morphology is summarized in (41).

(41) How plurals merge (Wiltschko, 2008)
  - •**Head merge**: Number merges with nouns and results in a new syntactic object which has the same label, Number
  - •**Modifier merge**: Number merges with nominals but cannot change the syntactic label

The idea that a plural can merge as a head or an adjunct in different languages is reminiscent of the behavior of negation.[10] There is evidence that in some languages, negation instantiates a functional head, while in other languages negation is an adjunct. Zanuttini (1996, 1997) showed that the negative particle *non* in Italian is the head of a functional projection. It behaves like French *ne* (not *pas* which is an adjunct) and other Romance negation in that it cannot occur to the left of Comp. Additionally, it interferes with clitic movement. In the Piedmontese variety, however, the negative particle *nen* behaves like French *pas*, an adjunct. It does not interfere with clitic movement, and it occupies the same position as adverbs. Along similar lines, Hankamer (2011) presents arguments that in infinitival-*to* clauses in English, negation is adjoined rather than heading NegP. Thus, if negation can vary as to whether it heads a functional projection or is an adjunct, it is not alone. Plural marking appears to be similar in this regard.

6.2   Where plurals merge

Wiltschko (2008) also proposes that plural morphology can vary cross-linguistically based on where the plural is merged along the DP. In the well-established cases of Hebrew and Romance, plurals merge at the Number Phrase. In Halkomelem, though, plural morphology has been shown to merge at the level of the acategorial $\sqrt{}$root. The main evidence for this proposal is that plural morphology in Halkomelem can occur between noun-noun compounds, as shown in (42), and that reduplicative plural morphology ignores the presence of derivational morphology, shown in (43) through (45) (from Wiltschko (2008)).

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[10]Thanks to Heidi Harley for mentioning this to me.

(42) s-xexp'-í:tsel
NOM-stripe.PL-back
'chipmunk (with more than two stripes' (Wiltschko, 2008, 644) data
from (Galloway, 1980, 63)

(43) p'-eq'
white
'white'

(44) s-p'-eq'
NOM-white
'white spot on skin'

(45) s-**p'-eq'**-p'eq' (*sp'eq'sp'eq')
NOM-white.PL
'white spots on skin' (Wiltschko, 2008, 645) data from (Galloway, 1993,
379)

The diagram in 46 below has arrows on the left which indicate the points
at which a plural morpheme could merge within the DP, based on Wiltschko's
(2008) typology.

(46) Where plurals merge (adapted from Wiltschko (2008))

```
           DP
          /  \
  →  D        #P
             /  \
       →  #      nP
                /  \
          →  n     
                   →  √root
```
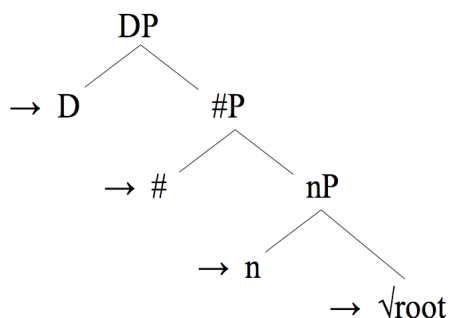
So far, we have outlined evidence that in a number of well known cases the
plural heads the functional #P (Hebrew and Romance). Wiltschko (2008)
presents evidence that in Halkomelem the plural merges with the root. In
Section 7, I outline the evidence that plural morphology in Yucatec Maya
merges as a syntactic modifier at the level of the DP, then in Section 8, I
examine evidence for languages that may have plural morphology that merges
at other levels of the noun phrase, such as nP and QP.

7 The Yucatec plural as DP-adjoined

7.1 Plural is higher than the $\sqrt{}$root

The plural morpheme in Yucatec does not merge with the root. It can only occur outside of noun-noun compounds, shown in (48), and it cannot inside of the noun-noun compound shown in (47).

(47) le   pol-ch'oom-**o'ob**-o'
     DEF head-village-PL-DIST
     'governors'

(48) *le   pol-**o'ob**-ch'oom-o'
     DEF head-PL-village-DIST
     'governors'

Yucatec Maya is not a language that makes extensive use of derivational morphology. Lois and Vapnarksy (2003) consider roots in Yucatec Maya to be highly underspecified for lexical category. Intransitive unergative roots require no derivation to be used as nominals. Intransitive unaccusative roots take an inflectional suffix which is also used with verbs. Transitive roots can undergo noun incorporation, antipassivization or anticausativization to become nominal (Bohnemeyer, 2009). Antipassivization and anticausativization do not involve concatenative morphology. They involve supra-segmental changes to the root vowel. Thus, there is some difficulty in showing that plural morphology may not occur inside of derivational morphology. Other nominal morphology, however, may point us in the right direction (especially if we assume a theory of morphology that does not make a pre-theoretical distinction between inflectional and derivational morphology, such as Distributed Morphology).

Nonetheless, there are some examples of nominal derivational morphology which show that the plural morpheme cannot occur inside of it. The plural morpheme cannot occur inside of the instrumental suffix in Yucatec, as shown in (49), but when the plural suffix follows the instrumental suffix, the resulting phrase is grammatical, as in (50).

(49) *x-muk-o'ob-ub
     AG-bury-PL-INSTR
     'shovels' (Bricker et al., 1998, 365)

(50) x-muk-ub-o'ob
AG-bury-INSTR-PL
'shovels'

In fact, the instrumental suffix must appear closer to the root because the vowel of the suffix undergoes vowel harmony (or more accurately, complete vowel echo), to match the vowel of the root (contrast (50) above with (51) below).

(51) x-tsaj-ab
AG-fry-INSTR
'frying pan' (Bricker et al., 1998, 365)

In addition, some inalienably possessed nouns require the suffix -*el*, which I will gloss IP for "inalienable possession." The example in (52) shows the IP suffix. The example in (53) shows that the plural morpheme cannot occur before the inalienable possession suffix. And, the example in (54) shows that the plural suffix occurring after the inalienable possession suffix is grammatical.

(52) in b'aak-el
A1 bone-IP
'my bone' (Bricker et al., 1998, 359)

(53) *in b'aak-o'ob-el
A1 bone-PL-IP
'my bones'

(54) in b'aak-el-o'ob
A1 bone-IP-PL
'my bones'

I take these facts as evidence that the plural morpheme occurs higher than other nominal morphology, such as that which marks inalienable possession and instrument-hood.

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7.2 Plural is higher than NumP

In addition to the evidence that the plural *-o'ob* in Yucatec Maya merges higher than the $\sqrt{}$root, there is evidence that it merges higher than the Number Phrase as well. In a coordinated DP, the plural marker can occur after the second noun and indicate the plurality of either noun, as shown in (55).[11]

(55) le   x-ch'úupal yéetel le   ko'olel-o'ob-o'
     DEF FEM-girl   and   DEF woman-PL-DIST
     'the girl and the women' / 'the girls and the women'

I will assume the structure in (56), based on cross-linguistic arguments for a similar structure for coordinated NPs (Progovac, 1997; Munn, 1993), which captures the long-standing intuition that the coordination of two NPs results in an NP and the coordination of two PPs results in a PP (Progovac, 1998; Jackendoff, 1977; Chomsky, 1981; Gadzar et al., 1985; Sag et al., 1985, *inter alia*).[12] If the plural marker were merged at NumP, then it should not be possible for it to occur on the highest DP in the coordinate structure and pluralize either, or both of the preceding nouns. Though it is possible to derive the plurality of the first noun from the fact that nouns which are unmarked for plural are underspecified for number, in Chapter 4, I present experimental evidence that the plural morpheme is preferentially adjoined to the highest DP.

(56) Plural adjoined to DP in coordinate DP
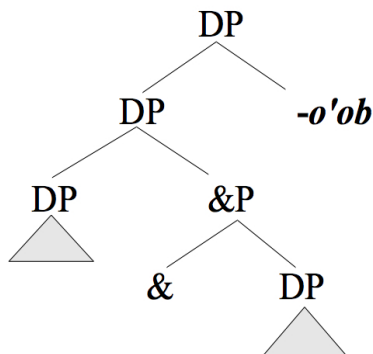
I have assumed thoughout that the plural morpheme is right adjoined to the DP, which is not in line with the antisymmetry assumptions of Kayne (1994). Given the Mirror Principle (Baker, 1985), the analysis of the plural morpheme as left-adjoined seems rather untenable, even after some additional mechanisms for the manipulation of morpheme order (Harley, 2010). One piece of distributional evidence that the plural morpheme may in fact be right-adjoined to the Determiner projection is that it cannot occur on a pre-nominal adjective, but it can occur on a post-nominal adjective. The example in (57) is acceptable, but the the examples in (58) with plural marking on a pre-nominal adjective are not, even if plural marking occurs on the head noun as well as the adjective, as in (58b).

(57) le   ki'ichpam x-ch'úupal(-**o'ob**)
   DEF pretty   FEM-girl(-PL)
     'the pretty girls'

(58) a. *le ki'ichpam-**o'ob** x-ch'úupal

     b. *le ki'ichpam-**o'ob** x-ch'úupal-**o'ob**

When the adjective is in postnominal position, however, plural marking on the adjective is possible, as shown in (59) below, whether or not the noun is marked with the plural morpheme.

(59) le   x-ch'úupal(-o'ob) ki'ichpam-**o'ob**
     DEF FEM-girl(-PL)   pretty-PL
     'the pretty girls'

If we assume Kayne (1994)'s analysis of prenominal adjectives as reduced relative clauses, predicates which are raised to the specifier of CP, then the Determiner-adjoined analysis explains this distribution. The tree in (60) shows that a prenominal adjective moved from its base position in the complement of T is no longer adjacent to the plural adjoined to the highest DP. This can explain why the sentences in (58) and (58b) with plural marking on the prenominal adjective are ungrammatical, while the sentence in (61) is grammatical. When the adjective is in its base generated position, it is linearized adjacent to the DP-adjoined plural.

(60) No plural on prenominal adjective
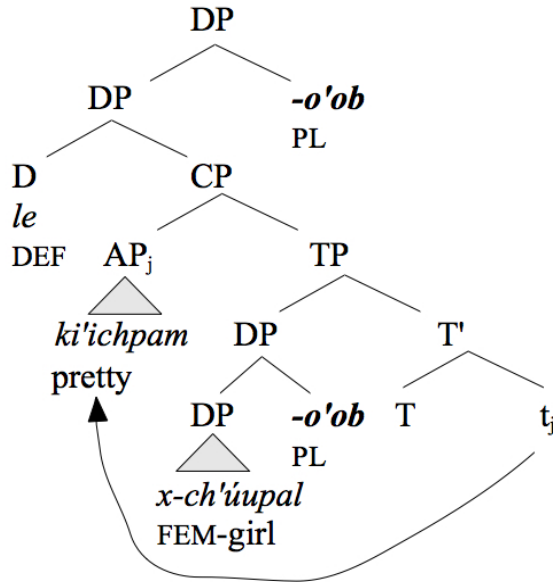
25

This can explain why the sentences in (58) and (58b) with plural marking on the prenominal adjective are ungrammatical, while the sentence in (59), repeated here in (61), is grammatical. When the adjective is in its base generated position, it is linearized adjacent to the DP-adjoined plural.

(61) le   x-ch'úupal(-o'ob) ki'ichpam-o'ob
      DEF pretty   FEM-girl-PL-DIST
      'the pretty girls'

On the other hand, in Walloon, a language in which plural morphology occurs in the Number Phrase (Bernstein, 1991), the plural marker can attach to pre-nominal adjectives, shown in (62) and (63). The plural marker on the adjective is underlined (Bernstein, 2001, 556) (data from Remacle 1952 and Morin 1986).[13]

(62) dès vèt_és_-ouh 'some green doors'

(63) dès nêur_s_-ouy 'some black eyes'

There is also some interpretational evidence that the Yucatec plural does not adjoin to the lexical level, nP. Though the homophonous plural -*o'ob* can

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[13]Plurals in Walloon are only used in writing. (Bernstein, 1991).

combine with nouns, verbs and adjectives, when it combines with verbs, it does not pluralize the event. Likewise, when it combines with adjectives, it does not intensify the property, rather on verbal and adjectival predicates, it functions to cross-reference a plural argument. Now, I turn to the evidence that supports the proposal the the plural morpheme in Yucatec Maya merges at the level of DP.

7.3 Evidence for DP adjunction

In this section, I outline additional distributional and interpretational evidence that lead to the conclusion that the plural morpheme in Yucatec Maya is merges at the level of DP.
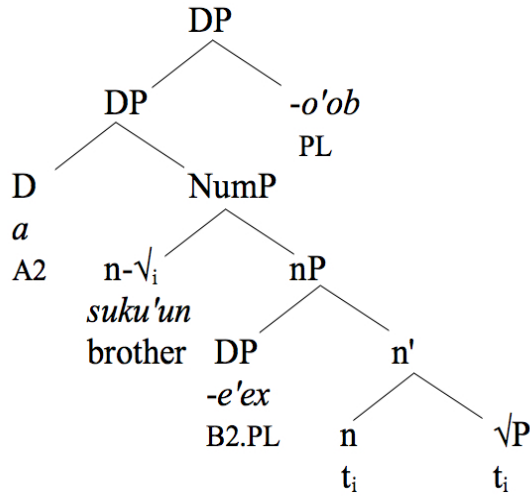
7.3.1 Plural outside of agreement morphology

One piece of distributional evidence that the Yucatec plural adjoins high in the Determiner Phrase is that it occurs outside of agreement morphology, shown in (64). The plural -*o'ob* which pluralizes the noun *suku'un*, 'brother,' occurs outside of the obligatory second person plural agreement suffix -*e'ex* which co-references the possessor.

(64) Kux   túun a   suku'un-e'ex-**o'ob**?
     what.about then A2 elder.brother-B2PL-PL
     'What about your (pl) elder brothers?'

The diagram in (65) shows that the plural has to be adjoined high in order to derive correct the morpheme order. In addition, the noun must move, potentially through successive cyclic head movement from $\sqrt{}$ through n and up to Num.

(65) Plural outside of agreement morphology

DP
├── DP
│   ├── D
│   │   *a*
│   │   A2
│   └── NumP
│   ├── n-√$_i$
│   │   *suku'un*
│   │   brother
│   └── nP
│   ├── DP
│   │   *-e'ex*
│   │   B2.PL
│   └── n'
│   ├── n
│   │   t$_i$
│   └── √P
│   t$_i$
└── *-o'ob*
    PL

This configuration may serve as preliminary evidence that though the nominal plural marker in Yucatec does not occur in the Number Phrase, this does not mean that Yucatec lacks a Number Phrase. NumP may be a necessary landing site for N-movment.

7.3.2 Interpretational effects of DP-adjunction

The proposal that the plural marker is adjoined to D raises some questions about its interpretation. For example, the D-adjoined plural might be predicted to result in a "pronominal determiner" reading, as in the sentence "We linguists are fun" in English.[14] In Yucatec, the number-marking plural is homophonous with the third person Set B plural cross-reference marker. Thus, a bare noun marked with -*o'ob* can mean either "We are linguists" or "linguists," as shown in (66). To the best of my knowledge, the first and second person plural cross-reference markers only have the predicational reading.

(66) Lingüista-o'ob
    linguist-B1.PL
    'We are linguists.' / 'linguists'

(67) Lingüista-o'on
    linguist-B1.PL
    'We are linguists.'

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[14]Thanks to Heidi Harley for posing this question.

(68) Yucatan-il-o'on
Yucatan-REL-B1.PL
'We are from Yucatan.' (Blair and Vermont-Salas, 1967)

The behavior of the third person plural and nominal plural -*o'ob* diverge in other aspects of the grammar as well. The paradigm of emphatic pronouns is constructed from the combination of a locative preposition *ti'* and the Set B cross-reference marker. The first and second person singular and plural forms obligatorily form contractions, while the third person plural form cannot contract and requires the presence of the definite determiner Bohnemeyer (2002), shown in Table 1.

Table 1: Yucatec Maya emphatic pronouns (adapted from (Bohnemeyer, 2002)

Person	Singular		Plural	
First	teen >	ti' + -en	to'on >	ti' + -o'on
		LOC + B1		LOC + B1PL
Second	tech >	ti' + -ech	te'ex >	ti' + -e'ex
		LOC + B2		LOC + B2PL
Third	*ti' >	ti' + 0	*to'ob >	ti' + -o'ob
		LOC + B3		LOC + B3PL
	le-ti'		**le-ti'-o'ob**	
	DEF-LOC		DEF-LOC-PL	

Another interpretational effect that could be attributed to the plural residing in the DP is that plural-marked DPs are interpreted as specific. Here is an example from a Yucatec speaking consultant. If a person goes to school wearing a new pair of shoes, people might ask him or her the question in (69).

(69) Tumben le   xanab-o'?
new   DEF shoe-dist
'Are those shoes new?'

If, however, a person goes to a shoe store and sees one pair of shoes that look somewhat old on a rack with a bunch of other shoes that look shiny and new, they might ask the question in (70).

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(70) Tumben le   xanab-o'ob-o'?
     new   DEF shoe-PL-DIST
     'Are those shoes new?'

The sentence in (70) with plural marking applies to a situation in which a person is referring to one specific pair of shoes among a larger set of shoes that exists throughout the shoe store. This conclusion is similar to the one made by Ghomeshi (2003) for Persian, but there are some issues with her analysis, primarily, the fact that a definite interpretation possible, even without the plural morpheme present (Karimi, pc.). My analysis is based on a wealth of distributional data, as well as experimental data (which will be presented in Chapter 5), and not just interpretational effects, which are not always tied to a particular syntactic position (see Coppock and Weschler (to appear); Gillon and Armoskaite (2011) for arguments that DP does not imply definiteness).

8 Revisiting the typology

I have presented distributional and interpretational evidence that the plural marker in Yucatec is a modificational adjunct to the DP. Now, I review the typology of plural marking and present some arguments from other languages to show the potential of additional types in the syntax of plural marking. I focus on nP plurals and QP plurals.

8.1 nP plurals

Some recent proposals provide evidence for plurals that merge at the level of nP as well. Gillon (in prep.) argues for a split analysis of plurals in Innu-aimun. One plural has the same semantics as the English plural and merges at NumP. The other has different semantics, similar to lexical plurals (Acquaviva, 2008; Alexiadou, 2010) and merges at nP. This is how plural mass nouns have two interpretations in Innu-aimun. One plural implies individuation, 'bottles of water,' while the other does not, 'lots of water,' as shown in (71) (Gillon notes that this is similar to the interpretation of mass plurals in Greek (Alexiadou, 2010)). Likewise, count nouns can get mass interpretations, as in 'tea' from 'leaf-plural' in (72).

(71) nipîaa
     water.pl
     'bottles of water' / 'lots of water' (Gillon, in prep., 8)

(72) ñĩp̃ĩsh-a
    leaf-inan.pl
    'tea' / 'cups of tea' (Gillon, in prep., 15)

In a similarly split analysis of plural marking in Amharic, Kramer (2009) argues that irregular plurals in Amharic merge a nP. They give rise to special interpretations, like lexical plurals. (She bases her analysis on arguments by Arad (2003; 2005) and Marantz (2001; 1997) that word formation at the level of the root in combination with a category-defining head, such as nP is more susceptible to phonological, and in this case, semantic irregularities). Kramer's main piece of distributional evidence is that the phenomenon of double pluralization, which she reports is common in Amharic, as in (73) which has an irregular plural and a regular plural co-occurring.

(73) k'al-at-otsts
    word-IRREG.PL-REG.PL
    'words'

Kramer argues that the irregular plural must combine with n, while the regular plural must combine with Num, since the opposite order of plural morphemes is ungrammatical, shown in (74).

(74) *k'al-otsts-at
    word-REG.PL-IRREG.PL
    'words'

These proposal present evidence for plural marking which occurs at the nP, in addition to NumP. In the next section, I review evidence for QP, quantificational, plurals.

8.2 QP plurals

In this section, I review some propals for QP plurals and show that Yucatec does not share the same properties. Park (2008) argues that the plural marker *-tul* in Korean requires a distributive reading. The sentences in (75) and (76) show that the plural marker *-tul* is optional in collective predicates with a distributive sub-entailment. When *-tul* is present, however, as in (76) the reading is that all of the professors participate.

(75) Swuhakkwa   kyoswu-ka   kyosil-ey   moyessta
Math-department professor-NOM classroom-LOC gather-PST
'Professors of a math department gathered in the classroom.' (Park,
2008) (data from Kwak (2003))

(76) Swuhak-kwa   kyoswu-**tul**-i   kyosil-ey   moyessta
Math-department professor-**tul**-NOM classroom-LOC gather-PST
'(All) The professors of a math department gathered in the classroom.'
(Park, 2008) (data from Kwak (2003))

The examples in (77) and (78) show that in truly collective predicates
(with no distributive sub-entailment), the plural marker -*tul* is infelicitous.

(77) Swuhak-kwa-nun   kyoswu-ka   ney myeng-ita
Math-department-TOP professor-NOM four CL-CPL.DC
'The professors of a math department are a group of four.'

(78) ??Swuhak-kwa-nun   kyoswu-**tul**-i   ney myeng-ita
Math-department-TOP professor-**tul**-NOM four CL-CPL.DC
'The professors of a math department are a group of four.'

The plural marker in Korean could, based on this small piece of inter-
pretational evidence, be a candidate for a plural that adjoins to QP, but
more conclusive evidence for this possibility is left for further studies. The
plural in Yucatec Maya does not adjoin to the QP. It does not result in the
distributive sub-entailment reading. The plural marker -*o'ob* is judged as ac-
ceptable in examples such as the one in (79) as well as those with distributive
sub-entailments in (80) and (81).[15]

(79) In   kiik-o'ob-e'   tu   múuch'-u-baj-o'ob   k'íiwik
A1SG sister-PL-TOP PFV-A3 together-A3-REFL-PL plaza
'My sisters gathered in the plaza.'

(80) Le xoknal-o'ob ti'   maaya-o' ya'ab-o'ob
DEF student-PL PREP Maya-DIST many-B3PL
'The students of Maya are many.'

(81) In   kiik-o'ob-e'   chowak-tak u pool-o'ob
A1SG sister-PL-TOP long-ADJ.PL A3 hair-PL
'My sisters have long hair.'

---

[15]Thanks to Andy Barss for originally posing this question to me.

In addition, the distributional facts presented in the previous section support the plural marker adjoining to DP and not lower.

Ghomeshi (2003) argues for an analysis of the plural marker -*ha* in Persian as licensed at the level of the DP or QP. She argues that the presence of the plural marker triggers definiteness effects. The example in (82) shows the indefinite reading, while the example in (83) shows a definite interpretation with plural marking.

(82) ketab xund-æm.
    book read.PST-IND
    'I read books.'

(83) ketab-ha-*(ro) xund-æm.
    book-PL-OM   read.PST-IND
    'I read the books.'

Though the example in (83) also has the object marker -*ro*, the example in (84) with a plural subject does not, and plural marking still results in a definite interpretation, according to Ghomeshi.

(84) bæčče-ha gerye=kærd-ænd.
    child-PL   cry=do.PST-3PL
    'The children cried.' (Ghomeshi, 2003, 57)

There are a number of problems with these arguments, however, the definite interpretation is still possible without the plural marker, as in (85).

(85) ketab-ro xund-æm.
    book-OM read.PST-IND
    'I read the books.' (Karimi, pc.)

Also, there is evidence that the interpretation of bare plurals is quite different for subjects and objects Carlson (1977); Diesing (1992).[16] Ghomeshi's examples in (83) and (84) compare an object and a subject. There is also a puzzling aspect of the plural marker residing in the D/QP in Persian, which is that number agreement is obligatory in the language (assuming that NumP is required for number agreement[17] (but see (Wiltschko, 2009) for a proposal in which it is not).
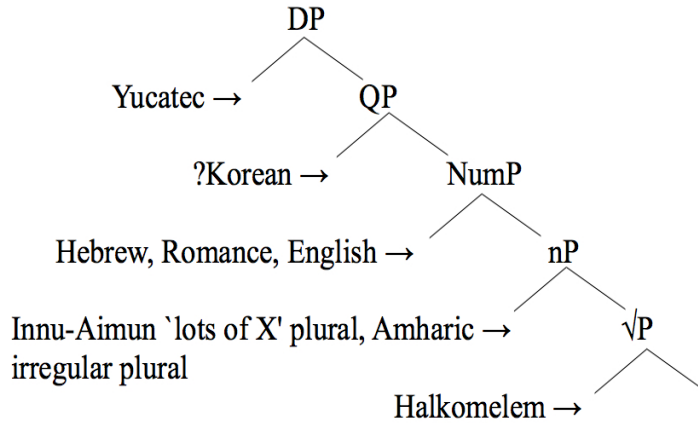
The tree in (86) summarizes the cross-linguistic evidence reviewed here in the typology of the syntax of plural marking.

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[16]Thanks to Heidi Harley for making this point.

[17]Thanks to Simin Karimi for pointing this out to me, along with the example in (85).

(86) Language types in the syntax of plural marking

```
                          DP
           Yucatec →           QP
                      ?Korean →     NumP
            Hebrew, Romance, English →     nP
       Innu-Aimun `lots of X' plural, Amharic →    √P
       irregular plural
                              Halkomelem →
```

9   Conclusions

In this chapter, I have presented distributional and interpretational evidence that the nominal plural marker in Yucatec Maya is adjoined to the DP. Plural marking is not necessary for a noun phrase to be interpreted as referring to a plurality. Plural marking cannot occur on a prenominal adjective. Plural marking can occur in the final position of a conjoined noun phrase. Plural marking occurs outside of agreement morphology. Additionally, plural marking results in a specific interpretation. This analysis represents an important piece of evidence for DP plurals and represents an expansion of the empirical coverage of the syntactic typology of plural marking (Wiltschko, 2008). In the next chapter, I present an analysis of plural marking and constituent order in the clausal domain in Yucatec Maya. In the two remaining chapters, I present a number of experiments which test the predictions of the DP-adjoined nominal plural hypothesis of this chapter as well as the hypothesis presented in the following chapter.

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