Nominal Arguments and Language Variation

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Acknowledgments
(to be added)
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Chapter 1

Introduction

This book investigates nominal arguments in classifier languages. There are two main goals. The first is to explore what is constant and what varies in the way classifier languages form nominal arguments. The second goal is to understand the relationship between argument formation in classifier languages and argument formation more generally.

In this book, I argue for the following four claims. First, bare numeral containing phrases have an identical D-less structure in classifier languages and number marking languages (possibly universally). Second, language variation in the nominal domain is due primarily to four factors: (i) what nouns denote, as kinds [+arg, –pred] or as properties [–arg, +pred] and what lower function heads (i.e. Div and Cl) denote (a function from properties to properties or a function from kinds to properties), (ii) whether or not languages have the functional category D in their grammar [±D], (iii) whether or not languages freely utilize covert argument formation operations (i.e. either null Ds in the syntax or covert type-shifts in the semantics) [±ARGunrestricted], and (iv) whether the function head Div/Cl in bare numeral containing phrases is silent or not [±Divsilent]/[±Cilsilent]. Third, it is not necessary to assume a functional category D that is always invisible in classifier languages like Mandarin in order to account for the behavior of their nominal arguments. Fourth, article determiners, distinct from other members of the determiner family like that or this, in classifier languages are in fact expected, contrary to the standard view, but while they can combine with numeral-classifier phrases and numeral-less classifier phrases, they should not combine with bare nouns. My proposal is that bare nouns in classifier languages are always argumental regardless of whether or not there are determiners.

Two classifier languages are the center of the discussion: Mandarin, a well-studied classifier language which has no overt evidence of article determiners (Lü 1944, 1947; Chao 1968; Li and Thompson 1981; Huang 1982, 1987, 1997; Tang 1990, 2005, 2007; Lin 1997, 1999; A. Li 1997, 1998, 1999; Chierchia 1998b; Cheng and Sybesma 1999, 2005, 2012; Borer 2005; Simpson 2005; Yang 2001; X. Li 2011, 2013; Jiang 2012; Zhang 2006, 2008, 2013, among many others), and Nuosu Yi, a head-final classifier language, which will be shown to have an overt article determiner. In addition to paying particular attention to these two classifier languages, the discussion of nominal arguments also covers a wider range of classifier languages and number marking languages from Romance, Germanic, and Slavic, as well as Hindi.

Nominal argument formation in Mandarin will be the focus of the first portion of this book. I begin this part with a detailed examination of the structure and the semantics of bare numeral classifier phrases in Mandarin by comparing them with bare numeral-
noun phrases in obligatory number marking languages like English and French. I show that although numeral classifier phrases and numeral-noun phrases differ in a great deal in their internal nominal domains, they share high similarities at the clausal level concerning their long-distance scope behaviors, semantic interpretations and syntactic distributions. I show how my proposed analysis of bare numerals, classifiers and bare nouns enables us to derive these differences and similarities and explain the internal behavior of Mandarin numeral classifier phrases. Building on this analysis of numeral classifier phrases, I reexamine Mandarin bare nouns, numeral-less classifier phrases, and complex noun phrases containing -men, a morpheme that has been analyzed as a plural marker like -s/es in English and has been used to argue for the existence of DP projections in Mandarin. The overarching goal of Part I is to argue for a D-less analysis of nominal arguments in Mandarin and a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b). I will show that it is not necessary to assume a functional category D(eterminer) that is always invisible in Mandarin in order to account for the behaviors of nominal arguments in this language.

Part II of this book is devoted to nominal argument formation in Nuosu Yi, a Tibeto-Berman language spoken in southern Sichuan and northern Yunnan, China. I show that Nuosu Yi is a classifier language which has several of the familiar properties of classifier languages common to this region. At the same time, this language is typologically unique in having classifiers as well as an overt definite article determiner which will be shown to be virtually identical to definite determiners in Romance and Germanic languages. Also unusual is the fact that demonstratives do not combine directly with nouns in this language but require the mediation of classifiers. These facts from Nuosu Yi essentially alter the landscape of the empirical data and put to rest the claim that classifier languages do not have overt determiners (Chierchia 1998b; Bošcović 2012a, 2014). Properties such as these will also be shown to pose a challenge to current accounts of argument formation. Specifically, Chierchia (1998b) explains the absence of article determiners in classifier languages as resulting from considerations of economy. If nouns in classifier languages are names of kinds, they can occur directly as arguments of verbs; hence there is no need for extra structure to host a determiner. The data from Nuosu Yi, which alters the empirical generalization regarding classifier languages, calls for an explanation. Crucially, Part II argues that despite the fact that Nuosu Yi has an overt definite determiner, this should not force us to change anything about the analysis of numerals, classifiers and nouns advanced in Part I. We shall see that the empirical adequacy of that analysis is substantiated by the fact that it can account not only for classifier languages without overt Ds but also for those that do have them.

In Part III of this book, I show that the proposed analysis of nominal argument formation in Mandarin and Nuosu Yi makes further predictions about other types of classifier languages. I identify languages that instantiate these predictions, discuss variation among them and account for how definiteness and indefiniteness are expressed in these languages. We will ultimately see that the proposed analysis of nominal argument formation is able to provide a uniform account of nominal arguments in classifier languages, thus allowing us to derive an updated typology of classifier languages with respect to their nominal structure. In the end of Part III, I discuss the
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relationship between argument formation in classifier languages and argument formation
more generally.

In this chapter, I start in Section 1.1 with a 'working-definition' of classifier
languages and an overview of their variable properties. In Section 1.2, I outline two
ongoing debates: one is about the syntax of nominal arguments, and the other is about the
reference of bare nominals. In Section 1.3, I provide a brief outline for the remaining
chapters of the book.

1.1 Classifier languages: their definition and variable properties

1.1.1 A 'working-definition' of 'classifier languages'

To give a descriptively useful theory-neutral definition of ‘a classifier language’ is not
easy. The traditional way to define a classifier language is roughly the following: a
classifier language is a language with a general system of ‘measure words’ that must be
used in combining a numeral with a noun. In this respect, a classifier language differs
from, say, Germanic and Romance languages where only mass nouns require a measure
word in order to be counted (e.g. a glass of milk) while count nouns can directly combine
with numerals (e.g. three boys). Take Mandarin as an example. A measure word is
required when nouns, no matter whether they are notional count or notional mass, are
counted by numerals:

(1) san *(ge) ren
three Cl person
‘three persons’

(2) san *(wan) shui
three bowl water
‘three bowls of water.’

(3) san *(bang) yintao
three pound cherry
‘three pounds of cherries’

(4) san *(qun) lang
three herd wolf
‘three herds of wolves’

(5) san *(ceng) naiyou
three layer naiyou
‘three layers of cream’

(6) san *(zhong) pijiu
three kind beer
‘three kinds of beer’
There are six types of classifiers for counting nouns in (1)-(6): (i) individual classifiers (1), (ii) container classifiers (2), (iii) standard measure classifiers (3), (iv) group classifiers (4), (v) partitive classifiers (5), and (vi) kind classifiers, which will be addressed in turn below.¹

The noun in (1) ren ‘person’ is notional count; it comes with built in standard units—individual human beings. Each individual human being can be identified and counted. In Germanic and Romance languages, nouns like ‘person’, which have a natural semantic partitioning built in to them and are notional count, combine directly with numerals (one person, two persons, etc.). In languages like Mandarin, a ‘measure word’ is required even with this type of noun in order to connect them with a numeral. The measure word in (1) ge does not create a unit of measure for the noun ren ‘person’; instead, it simply names the unit in which the entity denoted by the noun naturally occurs (c.f. Cheng and Sybesma 1999: 515). I refer to the measure words of this sort as ‘individual classifiers’ (these are the ‘individual measures’ in Chao 1968: 585, the 'sortal classifier' in Lyons 1977: 463 and Aikhenvald 2000:115, and the ‘count-classifier’ in Cheng and Sybesma 1999: 515).

The second type of classifiers is illustrated by words like wan ‘bowl’ in (2), which is a container noun used as a measure (Chao 1968: 601). It creates a unit of measure for both notional countable nouns (e.g. three bowls of cherries) and notional mass nouns—nouns that do not have a naturally built-in semantic partitioning (e.g. three bowls of water). I refer to measure words which are container denoting and create a unit of measure for the nouns as ‘container classifiers’. In (3), the measure word bang ‘pound’ is a standard measure for weight; it also creates a unit for both notional count nouns and mass nouns. I refer to words of this type as ‘standard measure classifiers’. The measure word qun ‘group’ in (4) is used for a collection or group of individuals (Chao 1968: 595), and I refer to words like this as ‘group’. The fifth type of measure words are those like ceng ‘layer’ in (5); these are semantically opposite to group classifiers and represent portions of things instead of groups of them (Chao 1968: 598), and I call this type of measure words ‘partitive classifiers’. The last type of classifiers are those like zhong ‘kind’ in (6); they are measures for subspecies (Krifka 1995: 399), and I refer to words of this type as 'kind classifiers'.

Note that the five types of classifiers in (2) to (6) have been subsumed under a broader term "mensural classifiers" (or "mass-classifiers"), which contrast with the "individual classifier" (or "sortal classifier", "count classifier") in (1) (Lyons 1977: 463; Croft 1994: 152; Cheng and Sybesma 1999: 515; Aikhenvald 2000: 115; Grinevald 2005: 1020). One key difference between these two is that mensural classifiers can be used for measuring units of notional count and mass nouns; whereas individual classifiers are used

¹ In Chao (1968: 584-620), measure words in Mandarin include four more types besides the six types of mentioned in this book; however, the other four kinds are not measures for counting nouns. These four kinds of measures are: (i) ‘measures associate with verb-object constructions’ (e.g. zuo le liang ren zong-tong ‘serve Asp two term president’: ‘serve two terms as a president’); (ii) ‘temporary measures’, which are usually nouns and do not allow numerals higher than ‘one (e.g. yi duzi bu gao-xing ‘one stomach not happy’: ‘a stomach of displeasure’); (iii) ‘quasi-measure’, measures that are autonomous (e.g. liang guo de ren ‘two country de people’: the people of the two countries); and (iv) ‘measures for verbs’—verbs as a measure serving as cognate object (e.g. kan yi kan ‘look a look’: ‘take a look’).
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only with notional count nouns and categorize nouns in terms of their inherent properties, such as animacy, shape, and consistency (Croft 1994: 151-152; Cheng and Sybesma 1999: 515; Aikhenvald 2000: 115; Grinevald 2005: 1020). Very crucially, only individual classifiers are unique to classifier languages, whereas constructions corresponding to the mensural classifier phrases are said to occur in all languages (Lyons 1977: 464; Croft 1994: 152; Löbel 2000: 223).

Take English as an example. English is usually not regarded as a classifier language (Allan 1977: 286; Lehrer 1986: 109; Aikhenvald 2000: 116), but it does have a particular construction, i.e., the so-called pseudo-partitive construction, which is equivalent in meaning to the mensural classifier phrases in (2-6) (Lehrer 1986; Löbel 2000), as illustrated below.

(7) a. three bowls of water
    b. three pounds of cherries
    c. three herds of wolves
    d. three layers of cream
    e. three kinds of beer

The underlined mensural expressions in (7) are usually treated as nouns rather than classifiers (Lehrer 1986; Van Riemsdijk 1998; Aikhenvald 2000; Löbel 2000; Borer 2005; Kayne 2005a). Generally, only mass nouns require mensural expressions in order to be counted by numerals in English; whereas count nouns can be counted by numerals directly (e.g., two books). But even with mass nouns, mensural expressions can be optional in English. It has been observed that English mass nouns can be used as count nouns, and the implicit mensural expressions would be determined by the context (Lehrer 1986: 110; Jackendoff 1997: 53; Chierchia 1998a: 57):

(8) a. Three coffees are especially high in caffeine. (kinds of coffee)
    b. Waitress, bring us 3 coffees, please. (cups of coffee) (Lehrer 1986: 110)

It is worth noting that English does have isolated instances of expressions, such as head and piece, which are quite close to individual classifiers like ge in (1) (Greenberg 1972: 12; Alan 1977: 293; Aikhenvald 2000: 115; Kayne 2005a: 254; Doetjes 2012: 2562):

(9) a. two head of cattle
    b. three pieces of furniture

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2 One exception to this generalization has been noted in Greenberg (1972: 16): “there are a considerable number of Amerind languages as well as some elsewhere, for example, in New Guinea which do not have measure constructions. Numerals occur directly both with nouns designating mass as well as countable objects.” Another exception to this generalization comes from languages which have very few numerals; these languages tend not to have numeral classifiers; see Aikhenvald (2000: 99-100).

3 In Löbel (1989: 146-153) and Mathieu and Zareikar (2015: 178-179), English measure words like pound and cup are treated as functional categories instead of nouns.

4 Without head or piece, the nouns in (9) cannot be counted by numerals directly *three cattle, three furniture. Löbel (2000: 247) refers to nouns like cattle as collective mass nouns; Chierchia (1998a, b, 2010: 110) refers to nouns like furniture as fake mass nouns.
The above examples have shown that English (and languages like it) has a dedicated construction equivalent in meaning to mensural classifier phrases (7) and that it has some isolated instances of expressions similar to individual classifiers (9). However, languages like English are very different from the classifier languages under consideration here, the latter of which have a general system of classifiers that is used in combining a numeral with any noun regardless of whether it is notional count or mass (1-6).

I will retain this aspect of the traditional definition of classifier languages. In addition, I will enrich this definition by listing a set of properties that typically cluster together with the traditional characterization of 'a classifier language' that was discussed.

The first additional property of classifier languages is that all classifier languages allow bare arguments (Chierchia 1998b: 354), i.e., nouns can appear in a bare form without the presence of numerals, classifiers, determiners, or plural elements in argument positions. For instance, in Mandarin the noun gou ‘dog’ is in a bare form and can appear in subject positions (10a) and object positions (10b). Two examples from Vietnamese to illustrate this point are given in (11).

(10)  
a. gou yao guo malu. (Mandarin)  
dog want cross road  
‘The dog wants to cross the road.’

b. wo xihuan gou.  
I like dog  
‘I like dogs.’ (Cheng and Sybesma 1999: 510)

(11)  
a. Bò ăn lúa kìa! (Vietnamese)  
cow eat paddy over there  
‘Look! (A/The) cow(s) is/are eating your paddy!’

b. Mang sách ra đây.  
bring book out here  
‘Get (a/the) book(s), will you?’ (Nguyen 2004: 30)

In contrast, nouns in Germanic and Romance languages cannot be freely used in bare forms—an article is needed and/or plural marking is required. The following examples from English and French illustrate this.

(12)  
a. I bought *(a) dog.  
b. Dog*(s) like meat.

(13)  
a. *(La) baleine est réputée être le plus grand mammifère (French)  
the whale is deemed be the more grand mammal  
‘The whale is regarded as the biggest mammal.’ (Chierchia 1998b: 341)

b. *(Les) baleines sont en train de disparaître.  
the whales are in train of disappear  
i. ‘The set of sub-species of whales is becoming extinct.’

ii. ‘Whales are becoming extinct.’ (Vergnaud and Zubizarreta 1992: 635)
Crucially, this generalization only goes one way; in the opposite direction, it does not hold: it is not the case that languages allowing bare arguments are all classifier languages; Russian, Hindi, and most Slavic languages are cases in point (see e.g., Chierchia 1998b; Dayal 2004, 2010; Bošević 2005). Those languages do not have overt determiners but freely allow bare arguments:

(14) a. Ljudi proizoshli ot obez’jan  
    *Men evolved from apes.*  
    ‘Men have evolved from apes.’

b. V komnate byli mal’chik i devocka  
    *in room were boy and girl*  
    ‘A boy and a girl were in the room.’

c. kutte bahut bhau Nkte haiN  
    *dogs lot bark*  
    ‘The dogs/Dogs bark a lot.’

d. kamre meN cuuhaa hai  
    *room in mouse is*  
    ‘There’s a mouse in the room’.  
    (Dayal 2004: 402, 404)

With respect to counting, however, nouns in Hindi and Russian behave similarly to Romance and Germanic languages: count nouns can combine directly with numerals, there are no individual classifiers, and only mass nouns require measure words to be counted by numerals.

The second additional property of classifier languages is that their bare nouns are generally number-neutral—they are undetermined with respect to singularity and plurality, as shown below.

(15) waimian gou zai jiao  
    *outside dog PROG bark*  
    i. ‘Outside, dogs are barking.’  
    ii. ‘Outside, the dog(s) are/is barking.’  
    (Yang 2001: 32)

(16) Mang sách ra dây.  
    *bring book out here*  
    ‘Get (a/the) book(s), will you?’  
    (Nguyen 2004: 30)

(17) bakkath-e haksaving-ka issta  
    *outside-in student-NOM exist*  
    ‘There is/are a student/students outside.’  
    (Nemoto 2005: 395)

(18) ami ei rastay kal rate gari dekhecilam  
    *I this road-LOC yesterday night car saw*  
    ‘I saw a car/cars on this road last night.’  
    (Dayal 2012: 16)
Some classifier languages prima facie seem not to have this number ambiguity in nouns. For example, in Nuosu Yi, bare nouns seem to be singular as they can only refer to singular entities in anaphoric cases. This is demonstrated below.

(19) *si-hni ma si-ni sse-vo ma i-go nyi, si-hni jiy nra. (Nuosu Yi)
     girl CL and boy CL house sit, girl very pretty
     ‘A girl and a boy are sitting in the house, the girl is very pretty.’

In (19), the bare noun *si-hni ‘girl’ can refer back to *si-hni ma ‘a girl’ in the antecedent sentence, and this bare noun receives a singular definite interpretation ‘the girl’. In contrast, the same bare noun *si-hni ‘girl’ cannot refer back to the plural expression *si-hni ggex ‘some girls’ in the preceding sentence in (20) and cannot receive a plural definite interpretation. In order to make the sentence in (20) grammatical, a plural-like element ggex together with a definite expression is needed to make the nominal phrase plural and definite, as shown below.

(20) *si-hni ggex sini sse-vo ggex i-go nyi, si-hni jiy nra. (Nuosu Yi)
     girl Q/CLpl and boy Q/CLpl house sit, girl very pretty
     Intended: ‘Some girls and some boys are sitting in the house, the girls are very pretty.’

(21) si-hni ggex sini sse-vo ggex i-go nyi, si-hni a-zyx ggex jiy nra.
     girl Q/CLpl and boy Q/CLpl house sit, girl Dem Q/CLpl very pretty
     ‘Some girls and some boys are sitting in the house, those girls are very pretty.’

(22) si-hni ggex sini sse-vo ggex i-go nyi, si-hni ggex su jiy nra.
     girl Q/CLpl and boy Q/CLpl house sit, girl Q/CLpl SU very pretty
     ‘Some girls and some boys are sitting in the house, the girls are very pretty.’

However, when looking at other examples, we find cases in which bare nouns in Nuosu Yi are indeed number neutral:

(23) a. Mary tep-yv vy bo o
     Mary book buy go SFP
     ‘Aka went to buy books/the book(s).’

b. mu lindo o.
     horse lose SFP
     ‘The horse(s) got lost.’

The bare noun tep-yv ‘book’ in (23a) and mu ‘horse’ in (23b) do have both singular and plural interpretations, in spite of the fact that the bare noun *si-hni ‘girl’ does not have plural reading in definite context in (20). Facts of this sort suggest that even in Nuosu Yi bare nouns are still generally number neutral.

The third additional property of classifier languages concerns plurality. It has been claimed that classifier languages lack obligatory plural marking on nouns.
Plural markers in classifier languages can be added to bare nouns with varying degrees of freedom (see also Aikhenvald 2000: 249). For instance, Mandarin has a morpheme *-men* which can be used to mark plurality (e.g. Lü 1947, 1990; Chao 1968; Norman 1988; Iljic 1994; A. Li 1999; Hsieh 2008), Japanese has a morpheme *-tachi* (e.g. Martin 1975; Nakanishi and Tomioka 2004; Nemoto 2005; Kobuchi-Philip 2011), and Korean has a morpheme *-tul* (e.g. Sohn 1999; Nemoto 2005; Park 2008; Y. Kim 2011). In Mandarin and Japanese, their plural morphemes are generally restricted to nouns referring to human beings (see Chao (1968) for Mandarin and Martin (1975) for Japanese); if non-human animate nouns are humanized, they can take *-men* in Mandarin (Lü 1947: 142) and *-tachi* in Japanese (Kobuchi-Philip 2011: 297). However, *-men* in Mandarin and *-tachi* in Japanese cannot be suffixed to inanimate nouns. Examples from Japanese are given in (24)-(25). In contrast, in Korean, the plural element *-tul* can be generously affixed to all nouns (human nouns, non-human inanimate nouns as well as inanimate nouns) (e.g., Sohn 1999; Nemoto 2005; J. Kim 2008; Y. Kim 2011), as illustrated in (26)-(27).

(24)  
| a. gakusei  | a'. gakusei-tachi  |
| student    | student-TACHI      | (Japanese) |
| ‘a/the student(s)’ | ‘(the) students’ | (Nemoto 2005: 398-399) |
| b. neko     | b'. neko-tachi     |
| cat         | cat-TACHI          | (Japanese) |
| ‘a/the cat(s)’ | ‘(the) cats’ |

(25)  
| a. tsukue   | a’. *tsukue-tachi  |
| desk        | tsukue-TACHI       | (Japanese) |
| ‘a/the desk(s)’ |                     | (Kobuchi-Philip 2011: 297) |

(26)  
| a. haksayng | a’. haksayng-tul   |
| student     | student-TUL        | (Korean) |
| ‘a/the student(s)’ | ‘students’ | (Nemoto 2005: 393, 398) |
| b. koray    | b’. koray-tul      |
| whale       | whale-TUL          |
| ‘a/the whale(s)’ | ‘(the) whales’ | (Nemoto 2005: 393, 398) |

(27)  
| a. sakwa    | a’. sakwa-tul      |
| apple       | apple-TUL          | (Korean) |
| ‘a/the apple(s)’ | ‘(the) apples’ | (Y. Kim 2011: 93) |

Plural elements in classifier languages, however, do not mark on classifiers in the same way as the canonical plural markers do in Romance and Germanic languages. In particular, plural markers in classifier languages do not occur on classifiers, no matter
how liberally they apply to nouns (see also Kayne 2005a: 252). In languages such as Mandarin and Japanese, this property is plainly true and perhaps is a reflection of the restriction to human of the plural elements –men and –tachi. In classifier languages like Korean, the plural element is not restricted to human or animates. However, -tul in Korean cannot occur on classifiers:

(28) a. *haksayng-tul twu myeng(-tul)
    student-TUL two Cl_individual-TUL
    'two students/students, two of them' (Y. Kim 2011: 117)

b. *haksayng-tul sey gurup(-tul)
    student-TUL three Cl_group-TUL
    'three groups of students'

b. *sakwa-tul ney pongci(-tul)
    apple-TUL four Cl_bag-TUL
    'four bags of apples'

This property distinguishes classifier languages from number marking languages with canonical number features such as Romance and Germanic languages where number features are marked not only on count nouns but also on mensural expressions. For instance, in English pseudopartitive constructions, plural morphology is obligatorily marked on the mensural words if the numeral is more than one:

(29) a. two piece*(s) of wood
b. two box*(es) of books
b. two pound*(s) of apples
c. two group*(s) of students
d. two layer*(s) of chocolate chips
e. two kind*(s) of cherries

In German pseudopartitive constructions, the mensural words can surface without plural morphology; however, plural morphology is still allowed (Löbel 1989, 1990; Wiltschko 2006; Ott 2011):

(30) a. zwei Stück/Stücke Holz
    two piece/piece.pl wood
    'two pieces of wood'


One exception to this generalization is the case as shown in (9a) two head of cattle in which the plural morphology cannot be marked on head (Greenberg 1972: 12; Alan 1977: 293; Aikhenvald 2000: 115; Kayne 2005a: 254; Doetjes 2012: 2562).

See Mathieu and Zareikar (2015) for discussions on cross-linguistic variation on measure words and plurality.
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b. zwei Glas/Gläser Bier
   two glass/glasspl beer
   'two glasses of beer'
c. zwei Blatt/Blätter Papier
   two sheet/sheetpl paper
   'two pieces of paper'  (Wiltschko 2006: 675)

The fourth additional property of classifier languages is that classifiers do not recur. A noun never takes multiple classifiers but only one classifier at one time to be counted by a numeral. For example, the noun yintao ‘cherry’ in (31) cannot take two individual classifiers, one individual classifier and one measure classifier, or one container classifier and one measure classifier to be counted by a numeral. A noun needs only one classifier, no matter which one out of the six types, to be counted by numerals, as we saw in (1) to (6).

(31)  
a. *san ke ke yintao  (Mandarin)
     three Clindividual Clindividual cherries
b. *san ke bang yintao
     three Clunit Clpound cherries
c. *san he ke yintao
     three Clbox Clindividual cherries
d. *san he bang yintao
     three Clbox Clpound cherries

As mentioned above, the construction that corresponds most directly in English to the numeral-classifier one of Mandarin is the so called ‘pseudo-partitive’ construction. If the semantics pans out, such a construction is allowed to recur:

(32)  
a. *three tons of kilos of meat
b. three truckloads of bottles of wine
   c. three tons of bales of hay

Importantly, the lack of recursion for classifiers in the counting context can be useful in deciding on ‘boundary’ cases of languages that might prima facie appear to be classifier ones. Let me illustrate through an example. 

Nez Perce, a Sahaptian language spoken in Idaho, Washington and Oregon (Deal 2010, 2011, 2016), might at first sight be analyzed as a classifier language. In this language when nouns are counted by numerals, an obligatory ‘classifier-like suffix’ is required on the numerals (33). This classifier-like suffix resembles the individual classifiers in classifier languages.

(33)  
mitaa*(-t) nicka?niicka?
     three-SUF strawberry
     'three strawberries'  (Deal 2011: 17)
Nez Perce also allows bare arguments (Deal 2011), and bare nouns are number neutral:

(34) a. 'a-x-caqa \textit{tim'es-ne ti'menwees-pe} \textit{(Nez Perce)}
    \begin{tabular}{ll}
    3OBJ-see-IMPERF-REC.PAST & book-OBJ \\
    & table-LOC
    \end{tabular}
    \textit{‘I saw a book on the table.’}

b. \textit{picpic}
   cat
   \textit{‘a cat/cats’} \textit{(Deal 2011: 2)}

Nez Perze also has a plural marking, but it can only suffix to human-referring nouns (Deal 2011, 2016). So the third additional property of classifier languages above cannot really be tested in this language. However, Nez Perce allows the individual-classifier-like suffix \textit{–t} to co-occur with mensural expressions, something that in canonical classifier languages would be tantamount to classifier recursion (see (31) above). An example is given below.

(35) a. mitáä*(-t) \textit{temiinewit} \textit{nickaʔniickaʔ} \textit{(Nez Perce)}
    \begin{tabular}{llll}
    3three-SUF & weight. measure & strawberry & \\
    \end{tabular}
    \textit{‘three pounds of strawberries’}

b. \textit{lep*(-ít) Pipselipt nickaPniickaP} \textit{(Deal 2016: 320)}
    \begin{tabular}{llll}
    2two-SUF & handful & strawberry & \\
    \end{tabular}
    \textit{‘two handfuls of strawberries’}

To summarize this sub-section, I adhere to the traditional definition of ‘a classifier language’ as requiring obligatorily a classifier to count every noun and will use four additional diagnostics that generally cluster with it as further criteria. This is schematized in the table below.

(36) \textbf{General criteria for the definition of a ‘classifier language’}

\begin{tabular}{l|l}
\hline
\textbf{Signature property} & \textbf{It has a general system of classifiers that must be used in} \\
& \textbf{combining a numeral with any noun.} \\
\hline
\textbf{Additional properties} & \textbf{i. It allows bare arguments.} \\
& \textbf{ii. Bare nouns are generally number undetermined.} \\
& \textbf{iii. Plural elements do not mark on individual or mensural} \\
& \textbf{classifiers, although they may mark on nouns.} \\
& \textbf{iv. Classifiers do not recur.}
\end{tabular}

Besides these universal properties that classifier languages share, there are properties that are also typical of them but in a variable manner. They concern different ways in which a classifier system may be realized. In the next sub-section, I will briefly discuss in a preliminary manner, what these qualities are.
1.1.2 Variable properties of 'classifier languages'

The first property along which classifier languages may vary is whether they allow bare classifier phrases, i.e. phrases consisting of only a classifier and a noun without a numeral, as exemplified in (37) and (38).

(37)  

\[
\text{Zek gau zungji sek juk.} \\
\text{Cl dog like eat meat} \\
\text{‘The dog likes to eat meat.’} \\
\text{Not: ‘Dogs like to eat meat.’ / ‘A dog likes to eat meat.’} \\
\] 

\[(Cheng and Sybesma 1999: 511)\]

(38)  

\[
\text{*Jia gau be lim zhui.} \\
\text{Cl dog want drink water} \\
\text{Intended: ‘The dog wants to drink water.’} \\
\] 

\[(Cheng and Sybesma 2005: 268)\]

Classifier languages that allow bare classifier phrases that will be discussed in this book include Mandarin, Nuosu Yi, Bangla, Cantonese, Vietnamese, and Bisu, while classifier languages that ban bare classifier phrases that I will discuss are Japanese, Korean and Thai.

The second variable property of classifier languages is whether and how definiteness is marked. Here I am not concerned with cases where definiteness is marked through the use of demonstratives; instead I am concerned about cases where definiteness is marked by either some functional categories (say, D in languages that have article determiners) or by dedicated word orders. Most classifier languages do not have marked definiteness—no overt Ds. For example, Mandarin marks definiteness through bare nouns (39). However, in some languages bare classifier phrases are clearly definite. Cantonese is a case in point (40) (Cheng and Sybesma 1999; Simpson 2005; Wu and Bodomo 2005; Simpson et al 2011). Based on this observation about Cantonese, Cheng and Sybesma (1999) propose that classifiers in Cantonese function as determiners. Another classifier language with arguably overtly marked definiteness is Bangla, which uses a dedicated word order within the nominal domain. In Bangla, there are two possible word orders involving numerals and classifiers. One is [Num-Cl-Noun] which can only be indefinite (41a), the other is [Noun-Num-Cl] which can only be definite (41b) (Dasgupta 1983; Bhattacharya 1998, 1999a, b, 2001; Dayal 2011b, 2012, 2014; Simpson et al 2011).

(39)  

\[
\text{jiao-shi li zuo zhe yi ge nan-sheng he yi ge nü-sheng, (Mandarin)} \\
\text{classroom inside sit PROG one Cl boy and one Cl girl,} \\
\text{nansheng kanqilai dagai ershi sui.} \\
\text{boy look probably twenty year} \\
\text{‘There is a boy and a girl sitting in the classroom. The boy looks probably in his twenties.’} \\
\]
1.2 Theoretical issues regarding nominal arguments

This section briefly discusses two ongoing debates regarding nominal arguments: one is about the syntax of nominal arguments and the other is about the reference of bare nominal argument terms.

Nouns, as is well known, can play two roles. First, nouns can denote entities or individuals and serve as arguments in the structure (42a). The entities/individuals that nouns denote can be particular ones, or general ones, or kinds. Second, nouns can denote properties and serve as predicates in a sentence (42ab). Properties are the attribute of objects—something general to different individual objects rather than just one object.
(42)  
   a. Firemen are brave.
   b. Bill and John are firemen.

How nouns become arguments has been the subject to much debate. Some authors claim that nouns have fixed denotations across languages (namely, properties) and must co-occur with an article determiner D in order to serve as arguments (e.g. Abney 1987; Longobardi 1994, 2001; Zamparelli 1995, 2000; Borer 2005). As a consequence, the structure of argumental noun phrases can be roughly analyzed as in (43), in which the functional head D merges with an NP, forming a determiner phrase (DP):

(43) \[ DP\ D [NP\ N]\]

Accordingly to this view, if there is no overt D, a covert D is assumed. That is, the functional category D is universally projected.

Other authors maintain that the D projection is subject to parameterization (e.g. Fukui 1988; Chierchia 1998b; Dayal 2004; Bošcović 2005 et seq). Whether D is syntactically projected or not depends on one of two things: the possibility that nouns may be inherently argumental (i.e. kind-referring) (Chierchia 1998b) and the availability of a semantic operation that turns nouns of the property-type into arguments, subject to some kind of blocking (Chierchia 1998b; Dayal 2004).

In this book, I consider how the facts from classifier languages fit into and inform the debate about the universal DP Hypothesis. Specifically, the discovery of a classifier language with an overt determiner may seem to tilt the balance in favor of the universal DP Hypothesis. However, I argue that the opposite is the case.

In addition to the debate regarding the structure of nominal argument formation, there is also an ongoing debate about the reference of bare nominal argument terms. One view takes bare nominal arguments to be ambiguous between kind terms and indefinites, based on evidence drawn from bare plurals in Germanic languages like English and German (e.g. Krifka 1988, Wilksinson 1991, Diseing 1992, Kratzer 1995). I refer to this approach as the Ambiguity Approach after Chierchia (1998b). An alternative view is that bare nominal argument terms denote kinds and that their object level meanings are derived from their basic kind level meaning (Carlson 1977; Chierchia 1998b; Dayal 2004, 2012). This view has been referred to as the Neocarlsonian view. The Neocarlsonian approach has a theory for predicting cross-linguistic variation which draws evidence from bare nominals in a wider range of languages, such as English, German, Italian, Mandarin, Hindi and Russian. This theory has been extended to examine bare nouns in various classifier languages such as Mandarin (e.g. Yang 2001; X. Li 2011; Jiang 2012); Japanese (e.g. Nemoto 2005), Thai (e.g. Piriyawiboon 2010; Jenks 2011), Vietnamese (e.g. Trinh 2011), and Bangla (e.g. Dayal 2012, 2014).

In this book, I demonstrate that the paradigms of Nuosu Yi fall nicely within the predictions of a Neocarlsonian theory of variation. At the same time, I argue that the facts of Nuosu Yi prompt modifications of the Neocarlsonian theory, which enable us to make further predictions about classifier languages.
1.3 Outline

The remaining chapters are organized as follows. Chapter 2 provides a detailed examination of the structure and the semantics of bare numeral classifier phrases in Mandarin. I compare numeral classifier phrases in Mandarin with numeral-noun phrases in number marking languages, focusing on their behavior in the internal nominal domain, as well as on their syntactic and semantic behaviors at the clausal level. I begin with a discussion of a list of tendentially universal properties of numeral-noun phrases in number marking languages, which serves as the basis for a general assumption about numerals. I argue for a D-less analysis of numeral-noun phrases, wherein numerals are phrasal in the syntax and are lexically ambiguous. Looking into numeral containing phrases in Mandarin, I observe that although they differ a great deal from those in number marking languages in terms of the internal nominal domain, their external syntax and semantics is rather similar to that of number marking languages concerning their long-distance scope behavior, semantic interpretations and syntactic distributions.

I argue that the D-less analysis of numeral-noun phrases in number marking languages can be extended to numeral classifier phrases in Mandarin to account for the cross-linguistically uniform behaviors of numeral containing phrases. I further argue for a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b); language variation in the nominal domain, under such an analysis, is primarily located in two interrelated factors: what nouns denote and what lower functional heads denote. Crucially, the proposed analysis of numeral classifier phrases in Mandarin will be shown to correctly predicts the scope behavior of its bare nouns. It also allows us to examine and account for the numeral-less classifier phrases \([\text{Cl N}]\) in Mandarin, which have rather restricted distributions but also exhibit the long-distance scope ability of numeral-noun phrases. I reach the conclusion that it is not necessary to stipulate an empty functional category D in Mandarin in order to account for the syntactic and semantic properties of bare nominal arguments in this language.

Chapter 3 discusses the implications of D-less framework of Mandarin bare nominal arguments for other types of nominal arguments in this language. I focus on phrases containing -men, a morpheme that has been analyzed as a plural marker and/or a collective marker and has been used to argue for the existence of DP projections in Mandarin. I defend the view that -men is a plural marker as first argued in A. Li (1999); however I argue against the analysis of placing -men in the D position or treating it as a definite determiner. I will show that that -men is compatible with numerals and classifiers, contrary to the traditional claim, and that -men should be located local to nouns and lower than numerals as well as classifiers. By treating -men as a plural morpheme, the Mandarin fact may seem to argue against the uniform D-less structure of bare numeral containing phrases in Chapter 2. However, I argue that the Mandarin fact does not force us to change the proposed nominal structure. Specifically, I propose an analysis of -men as an associative plural marker and an associative plural projection closer to the noun and lower than the classifier, building on the split analysis of plurality (e.g. Wiltschko 2008; Kramer 2009, 2010, 2016; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zareikar 2015). The analysis of -men together with the D-less analysis of
bare nominals in Mandarin developed in Chapter 2 will be shown to account for the properties of different types of phrases containing -men in a coherently principled manner. The discussion in this chapter will show that it is not necessary to assume a functional category D that is always invisible in the grammar of Mandarin in order to account for the behaviors of nominal arguments containing -men, providing further evidence for the lack of DP in Mandarin.

In Chapter 4, I examine a typologically new kind of language, Nuosu Yi. I show that Nuosu Yi exhibits the expected features of a classifier language. However, it also has an overt definite article which encodes presuppositions of familiarity, uniqueness and maximality. Also unusual is the fact that demonstratives do not combine directly with nouns in this language but require the mediation of classifiers. These facts from Nuosu Yi will be shown to essentially alter the landscape of the empirical data and put to rest the claim that classifier languages do not have overt determiners (Chierchia 1998b; Bošcović 2012a, 2014). Properties such as these will also be shown to pose a challenge to accounts of argument formation developed in Chapter 2 and Chapter 3. In particular, the discovery of a classifier language with an overt determiner may seem to tilt the balance in favor of the universal DP Hypothesis and also disprove the Chierchia's (1998b) Nominal Mapping Hypothesis adopted in Chapter 2 and 3, since such a language contradicts Chierchia's speculation that classifier languages should not develop article determiners in their grammar given that nouns in classifier languages are names of kinds and can occur directly as arguments of verbs. However, I will argue that the opposite is the case. Specifically, I argue that despite the fact that Nuosu Yi has an overt definite determiner, this should not force us to change anything about the analysis of numerals, classifiers and nouns advanced in Chapter 2 and Chapter 3. I will show that a modification of Chierchia's (1998b) framework is needed and that the modified framework can account for why classifier languages with overt Ds are possible but rare as well as allowing us to make further predictions about classifier languages.

The goal of this Chapter 5 is to develop a uniform account of bare nominal arguments (i.e. bare numeral classifier phrases, bare classifier phrases, bare nouns) in classifier languages. I achieve that by having an overview of more classifier languages. I start with three points on which Mandarin and Nuosu Yi differ and which make this comparison interesting from the perspective of building a theory of cross-linguistic variation. Their differences, as I will show, mainly lie in: (i) whether or not they have the function category D in their grammar, (ii) whether or not they freely allow numeral-less classifier phrases to appear in argument positions, as a result of applying covert argument formation operations (ARG) unrestrictedly, and (iii) whether or not they allow one-deletion from the [one Cl N] phrase in the PF. I propose three parameters to account for the variation: \( \pm D \), \( \pm ARG \), \( \pm one\)-deletion. The three parameters make predictions about eight types of classifier languages, most of which, as we will see, are indeed attested.

In Chapter 6, I discuss the relationship between argument formation in classifier languages and argument formation more generally. I begin with a discussion on the variable properties and uniform properties concerning nominal arguments in number marking languages (e.g. English, French, Italian, and Hindi) and show that their variation can be captured by two of the parameters in classifier languages: \( \pm D \) and \( \pm ARG \text{unrestricted} \). I further show that the variation in nouns regarding what they are coded,
as kinds [+arg, −pred] or as properties [−arg, +pred], can differentiate classifier languages from number marking languages.

I then discuss languages, which have neither a general classifier system (unlike Mandarin or Nuosu Yi) nor obligatory singular/plural marking on nouns (unlike English or Hindi), such as Yudja and Lhasa Tibetan. We will see a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages. Building on Lima (2010, 2012, 2014), Zhang (2013), and Chierchia (2014), I treat Yudja as a language in which nouns denote kinds and which has a silent Cl and Lhasa Tibetan a language which has a silent Div and freely allows covert argument forming operations on its bare nouns. As we will see, the discussion on number marking languages and Yudja/Lhasa Tibetan allows us to further update the variation and typology of nominal argument formation across languages and to predict more types of languages.

Finally, Chapter 7 summarizes the major claims of this work and offers avenues for future researches.
Part I

A Classifier Language without D: Mandarin
Chapter 2

Numeral Classifier Phrases and Bare Nouns in Mandarin

2.1 Introduction

This chapter investigates the syntactic and semantic properties of Mandarin numeral classifier phrases as well as their internal domain. Mandarin numeral classifier phrases consist of a numeral, a classifier and a noun in the order [Num Cl N]. I compare numeral classifier phrases in Mandarin with numeral-noun phrases in number marking languages, that is, languages with obligatory morphological exponents of grammatical number, like English, French and Russian, focusing on their behavior in the internal nominal domain, as well as on their syntactic and semantic behaviors at the clausal level. I begin with a discussion of a list of tendentially universal properties of numeral-noun phrases in number marking languages, which serves as the basis for a general assumption about the semantics and syntactic status of numerals. I argue for a D-less analysis of numeral-noun phrases, wherein numerals are phrasal in the syntax and are lexically ambiguous between a modifier and a modifier with a built-in choice function variable. It will be shown that the proposed D-less analysis of numeral-noun phrases can capture their remarkable cross-linguistic argumental behavior in a straightforward way.

Looking into numeral containing phrases in Mandarin, I observe that although they differ a great deal from those in number marking languages in terms of the internal nominal domain, their external syntax and semantics is rather similar to that of number marking languages concerning their long-distance scope behavior, semantic interpretations and syntactic distributions.

I argue that the D-less analysis of numeral-noun phrases in number marking languages can be extended to numeral classifier phrases in Mandarin to account for the cross-linguistically uniform behaviors of numeral containing phrases. I further argue for a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b); language variation in the nominal domain, under such an analysis, is primarily located in two interrelated factors: what nouns denote and what lower functional heads (i.e. canonical number morphology and classifiers) denote.

Crucially, the proposed analysis of numeral classifier phrases in Mandarin correctly predicts the scope behavior of its bare nouns. It also allows us to examine and account for the numeral-less classifier phrases [Cl N] in Mandarin, which have rather restricted distributions but also exhibit the long-distance scope ability of numeral-noun phrases. Last but not least, the account proposed in this chapter has further implications for other types of nominal phrases in Mandarin, both with and without classifiers. I elaborate on the details in Chapter 3.
The chapter is organized as follows. Section 2.2 discusses a list of tendentially universal properties of numeral-noun phrases in number marking languages, such as English, French and Russian, and briefly reviews previous analyses of numerals and numeral-noun phrases with respect to their syntax and semantics. I argue for a D-less analysis of numeral noun phrases. Such an analysis of numeral provides the basis for understanding numeral classifier phrases in Mandarin.

Section 2.3 reexamines numeral classifier phrases in Mandarin with regard to their internal properties, scopal abilities, semantic interpretations and syntactic distributions. We will see that Mandarin numeral containing phrases differ in a great deal from those in number marking languages in their internal nominal domain but are rather similar to them in the external syntax and semantics. I show that although previous analyses have provided us with important insights about Mandarin numeral classifier phrases, they are unable to capture all of the peculiarities in behavior that Mandarin numeral classifier phrases exhibit.

Section 2.4 argues for a D-less analysis of numeral classifier phrases in Mandarin and a kind-referring analysis of Mandarin bare nouns. I show in this section that the proposed analyses successfully captures the differences and similarities between numeral-containing phrases in Mandarin and those in number marking languages.

The analysis of bare nouns in Mandarin as kinds predicts that bare nouns in Mandarin should behave like bare nominals in English, which are also kind-referring (Carlson 1997a, b) and to exhibit the property of narrowest scope, unlike English indefinites. We will see in Section 2.5 that the predicted scope behavior of Mandarin bare nouns is borne out, as confirmed by observations made in Yang (2001) and X. Li (2011, 2013). The rest of this section is devoted to the definite interpretations of bare nouns, which, as I argue, is derived from its kind references. We further see that bare nouns in Mandarin cannot project a DP. Thus, numeral classifier phrases and bare nouns in Mandarin, under the analysis presented here, are both D-less.

Section 2.6 introduces and discusses the numeral-less classifier phrases in Mandarin [Cl N], focusing on their scope behavior, semantic interpretations and syntactic distributions. I argue that Mandarin [Cl N] is the result of phonologically deleting one from [one Cl N] and has the full structure of the numeral classifier phrases, by adopting the one-deletion view as first argued in Lü (1944). Section 2.7 discusses the interpretational restriction for nominals in the sentence initial position unique to Mandarin. Section 2.8 summarizes.

### 2.2 The external syntax and semantics of bare numeral-noun phrases: some tendentially universal patterns

This section examines the external syntax and semantics of bare numeral-noun phrases, like *three cats*, in number marking languages, that is, languages with obligatory morphological exponents of grammatical number. The reason for doing so is to show

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1 ‘Number marking languages’ in this work refers to standard number marking languages such as Romance and Germanic languages where number morphology is obligatory when a numeral (except for ‘one’) combines with any count noun. Number marking languages in this book do not include languages like...
that their distribution and interpretation display a formidable uniformity across languages, regardless of whether or not the language has an overt article D(eterminer) (Section 2.2.1). Because this behavior appears to be universal, when a bare numeral and a nominal are combined, all else being equal, they should have uniform syntax and semantics. I will argue for such an analysis in Section 2.2.2, and this will constitute my baseline. From it, I arrive at understanding the syntax and the semantics of numeral classifier phrases in Mandarin in Section 2.3.

2.2.1. Cross-linguistic properties of numeral-noun phrases

As is known, numerals can have two basic types. First, numerals can denote properties of type \(<e, t>\) (1ia) or property modifies of type \(<<e, t>, <e, t>\>\) (1ib); second, numerals can denote entities of type \(<e>\) (1ii).

(1) Basic types of numerals
   i. properties or property modifiers
      a. Those are 3.
      b. those 3 boys.
   ii. entities
      a. 5 is my lucky number
      b. John weights 100 pounds.
      c. John is 5 feet tall.

The numeral ‘3’ in (1ia) is property-denoting, serving as the predicate of ‘those’; ‘3’ in (1ib) serves as a property modifier, modifying ‘boys’. The numerals in (1ii), on the other hand, denote entities. The numeral ‘5’ in (1iia) denotes entities and directly serves as the argument. In ‘the weight of John measured in pounds is 100’ in (1iib), the numeral ‘100’ also denotes an entity. If adopting the view that gradable adjectives have a degree-based semantics (e.g. see Kennedy 1999; Kennedy and McNally 2005), the numeral in (1iic) can also be regarded as entity-denoting, and (1iic) can be paraphrased as ‘the degree of John’s height measured in feet is five’.

Concerning bare numeral-noun phrases, they exhibit a list of key properties in English: (i) predicative, (ii) serve as restrictors of definites, (iii) receive a narrow scope existential reading, (iv) exhibit long-distance scope and island escape-ability (e.g. Fodor and Sag 1982), (v) receive a generic/individual level interpretation (e.g. Krifka et al

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Turkish, Hungarian or Western Armenian, which have number morphology on bare nouns without the occurrence of numerals but ban number morphology or optionally allow it on nouns when they appear with a numeral. These languages will be referred to as non-canonical number marking languages. The variation between number marking languages and non-canonical number marking languages in the literature has been attributed to differences with respect to syntactic agreement (Ritter 1991; Frank 1994), or a different semantics for their numerals (Bale et al 2011), or the different semantics of the functional head determines number morphology on nominals (Sauerland 2003; Sauerland et al 2005; Scontras 2011, 2014). I leave these non-canonical number marking languages for future research.
1995); (vi) lack of anaphoric use, and (vii) have entity level use.\(^2\) Examples to illustrate these properties are given below.

(2) Property 1: predicative
   a. John and Bill are \textit{two boys}.
   b. I consider John and Bill \textit{two great guys}.

(3) Property 2: restrictors of definites
   a. John hired \textit{those two boys}.
   b. John hired \textit{the two boys}.

(4) Property 3: narrow scope existential reading
   John hired \textit{two workers}.

(5) Property 4: long-distance scope and island-escaping ability
   a. If John hires \textit{two workers}, he will be in good shape.
      (i) Narrow scope: if > two workers
      (ii) Wide scope: two workers > if
   b. Every professor will rejoice \{if \textit{three students of his} do well on the exam\}.
      (i) Narrow Scope: every > if > three students of his
      (ii) Intermediate Scope: every > three students of his > if

(6) Property 5: generic interpretation
   a. \textit{Three boys} can lift a piano.
   b. \textit{Six apples} cost one dollar.

(7) Property 6: lack of anaphoric use
   John bought three dogs and five cats. #(The/Those) \textit{Five cats} are very expensive.

(8) Property 7: entity level use
   John weighs \textit{three kilos}.

Compared with other properties, the fourth property (long-distance scope and island-escaping ability of numeral-noun phrases) (5) is relatively less transparent; I briefly provide the background of this property below.

Since May (1977), a large part of the literature on Logical Form has assumed that a covert operation can produce a syntactic and thus semantic representation that cannot be observed in the surface phonetic form of a sentence; this operation is generally referred to as Quantifier Raising (QR). One important argument in favor of a syntactic

\(^2\) In this book, I restrict my discussion to bare numeral-noun phrases and do not concern about modified numeral-noun phrases, such as \textit{exactly two books}, \textit{about four books}, or other amount expressions, like \textit{many books} and \textit{few books}. Modified numeral-noun phrases have different scope behaviors from those of bare ones discussed in book, i.e. the former lack the long-distance scope behavior (see Kamp and Reyle 1993; Beghelli 1995; Beghelli and Stowell 1997; Szabolcsi 1997, 2010; Winter 2001, 2005, a.o.).
scope mechanism such as QR is that it is subject to island constraints (Ross 1967) just like overt syntactic extractions. For instance, in the following sentence the quantifier phrase ‘every woman’ can receive either a wide scope or a narrow scope interpretation.

(9) Some men like every woman.
   (i). Wide Scope: every > some
   (ii). Narrow Scope: some > every

In (10a), however, only the narrow scope interpretation within the adjunct if-clause is available for ‘every woman’. This sentence cannot receive a wide scope reading out of the adjunct clause; (10a) will not be interpreted as ‘that the arrival of any woman will be sufficient for John to be glad’ (Winter 1997: 401). The unavailability of the wide scope interpretation of ‘every’ out of the adjunct clause in (10a) is parallel to the impossibility of extracting a wh-phrase out of an adjunct island, as exemplified in (10b). The identical behavior of (10a) and (10b) thus shows that QR is subject to structural restrictions.

(10) a. [If every woman comes to the party] John will be glad.
    (i). Narrow Scope: if > every
    (ii). *Wide Scope: every > if


Nevertheless, since Fodor and Sag (1982) and much subsequent literature, the exceptional island-escaping behavior of indefinites (e.g., ‘some’, ‘a’) has received much attention. Indefinite NPs, unlike other quantifier phrases, can escape all islands for extraction (Ruys 1992: 102-103). For instance, in the example in (11), besides the narrow scope interpretation, the indefinite ‘some woman’ can escape from the adjunct island to receive a wide scope reading over the if-clause:

(11) [If some woman comes to the party] John will be glad.
    (i). Wide Scope: some > if
    (ii). Narrow Scope: if > some (Winter 1997: 402)

Farkas (1981), Ruys (1992), and Abusch (1994) have further argued that indefinites can escape islands without having the widest sentential scope. For example, in (12), the indefinite phrase ‘a student of his’ can receive a narrowest scope interpretation within the if-clause: ‘for every professor, the cheating on the exam by any student of his will be sufficient to make him rejoice (12i). In addition to this narrowest scope interpretation, ‘a student of his’ can also have a scope narrower than the sentence initial quantifier phrase ‘every professor’ but wider than the if-clause. The interpretation of such a scope can be paraphrased as ‘for every professor, there is a specific student of his; if this student of his cheats on the exam, he will rejoice’ (12ii). This scope of indefinites which is narrower than the sentential scope-bearing element but wider than another scope-bearing element is referred to as Intermediate Scope.
(12) Every professor will rejoice [if a student of his cheats on the exam].
   (i). Narrow Scope: every > if > a student of his
   (ii). Intermediate Scope: every > a student of his > if (Ruys 1992)

Regarding numeral-noun phrases, they behave like indefinites ‘a’ and ‘some’ with respect to the ability to escape islands and long-distance scope interpretations (Farkas 1981; Ludlow and Neale 1991; Ruys 1992; Winter 1997, 2001a, 2005; Kratzer 1998; Ionin and Matushansky 2006). Some similar examples are given below:

(13) [If one woman comes to the party] John will be glad.
   (i). Wide Scope: one > if
   (ii). Narrow Scope: if > one

(14) Every professor will rejoice [if three students of his cheat on the exam].
   (i). Intermediate Scope: every > three students of his > if
   (ii). Narrow Scope: every > if > three students of his

In (13), if the numeral-noun phrase ‘one woman’ has wide scope over the if-clause (13i), it refers to one specific woman and the sentence is interpreted as ‘there exists one specific woman whose arrival to the party will make John glad’. In contrast, when ‘one woman’ receives a narrow scope interpretation within the conditional clause (13ii), it refers to any woman and this interpretation is nonspecific. Accordingly, we interpret the sentence as ‘the arrival of any woman will be sufficient for John to be glad’. Likewise, in (14), when ‘three students of his’ receives an intermediate scope interpretation (14i), it refers to three specific students and the sentence is interpreted as ‘for every professor, there are three specific students of his; if these three specific students cheat on the exam, he will rejoice’. On the other hand, when ‘three students of his’ is within the scope of the if-clause, it receives a nonspecific indefinite interpretation such as ‘any three students’. Therefore, the sentence is interpreted as ‘for every professor, the cheating on the exam by any three students of his will be sufficient to make him rejoice.’

This exceptional long-distance scope behavior as well as the island-escaping ability of indefinites headed by a or some and numeral indefinites, as shown in Kratzer (1995), Reinhart (1997), and Winter (1997), require an analysis distinguishable from standard quantification, which I will address in Section 2.2.3.

Returning to the list of properties of numeral-noun phrases in (2) through (8), these properties are attested in other number marking languages, independent of ‘how much D’ they have.3 I elaborate this point with French and Russian below.

3 Concerning what instantiates the functional category ‘D’ (e.g. determiners and/or demonstratives), this book holds the following view. In a broad sense, demonstratives (e.g. English this/that) would fall under the D-family, together with determiners, such as English the/a. But in a narrow sense, the functional category D includes determiners but not demonstratives. That is to say, demonstratives like that/this in English and zhe/na ‘this/that’ in Mandarin would not fall under the category D in the narrow sense. The motivation for ‘the category D in the narrow sense’ is based on the differences between determiners and demonstratives with respect to their semantics and structural positions, which I will address in Section 2.4.1.

In this book, I will only focus on D in the narrow sense, i.e. I view that the functional category D
In a language like French which has overt article determiners, bare nominals are banned in argument positions, and the article determiners are always required (e.g. Vergnaud and Zubizarreta 1992; Chierchia 1998b):

(15)  a. *(Les) baleines *sont en train de disparaître.  
      the whales are being of disappear  
      (i). ‘Whales are becoming extinct.’
      (ii). ‘the set of sub-species of whales is becoming extinct.’
          (Vergnaud and Zubizarreta 1992: 635)

      b. *(La) baleine est réputée être le plus grand mammifère  
      the whale is deemed be the more grand mammal
      ‘The whale is regarded as the biggest mammal.’  (Chierchia 1998b: 341)

In such a ‘strict’ DP language in which overt Ds always project in the syntax, the same behavior of numeral-noun phrases in (2) through (8) is observed.

Specifically, French also freely allows numeral-noun phrases to be arguments and does not require article determiners to appear with them (16). Its numeral-noun phrases can receive a narrow scope existential reading (16a, b), exhibit island-escaping ability (16c), have long-distance scope (16c, d), and receive a generic interpretation (16e). French numeral-noun phrases can also serve as restrictors of definites (17); they also lack anaphoric use (18) but have entity use (19).

(16)  French Numeral-Noun Phrases : argumental
    a. *J'ai vu deux chiens.*  
        I saw two dogs
        ‘I saw two dogs’
        [narrow scope existential]
    b. *Il y a deux chiens.*
        there have two dogs
        ‘There are two dogs’
        [narrow scope existential]
    c. *Si tu apportes deux filles à la fête, j'en serai heureux.*
        If you bring two girls to the festival I will be happy
        ‘If you bring two girls to the party I will be happy’
        (i). Wide scope: two > if [island escaping]
        (ii). Narrow scope: if > two
    d. *La plupart des professeurs ont lu chaque essai que deux étudiants ont écrit.*
        the most of professors have read every essay that two students have written
        ‘Most professors have read every paper that two students wrote.’
        (i). Intermediate scope: most > two > every [island escaping]
        (ii). Narrow scope: most > every > two

includes article determiners but not demonstratives.
(17) French Numeral-Noun Phrases: predicative use

*Ils sont deux étudiants*

They are two students

‘They are two students.’

(18) French Numeral-Noun Phrases: restrictors of definites

*Les /ces deux chats*

The/these two cats

‘The/these two cats’

(19) French Numeral-Noun Phrases: no anaphoric use

*Jean a acheté deux chiens et deux chats.*

John has bought two dogs and two cats.

#(Les)/ #(ces) deux chats sont coûteux.

The/these two cats are expensive

‘John bought two dogs and two cats. The/these two cats are expensive.’

(20) French Numeral-Noun Phrases: entity use

*Jean pèse trois kilos.*

John weighs three kilos

‘John weighs three kilos.’

In contrast, Russian does not have overt evidence of article determiners and freely allows bare arguments (e.g. Dayal 2004; Bošcovic 2005), as shown in (21).

(21) a. *Ljudi proizoshli ot obez’jan*  

Men evolved from apes.

‘Men have evolved from apes.’

b. *V komnate byli mal’chik i devocka*  

in room were boy and girl

‘A boy and a girl were in the room.’ (Dayal 2004: 402, 404)

Russian numeral-noun phrases also exhibit the same properties in (2) through (8), just like their English and French counterparts, as demonstrated in (22) through (26).

(22) Russian Numeral-Noun Phrases: argumental

a. *V komnate piat’ sobak.*  

in room five dogs

‘There are five dogs in the room.’
b. *Ja viděla p'jat' sobak.*  
   I-nom see.past five dogs  
   ‘I saw five dogs.’

c. *Ja budu schastliv, esli ty pridjosh' na vecherinku s dvumja devushkami.*  
   I be.fut happy if you come on party with two girls  
   ‘If you bring two girls to the party, I will be happy.’

   (i). Wide scope: two > if [island-escaping]
   (ii). Narrow scope: if > two

d. *Bol'shinstvo professorov prochitali kazhduju rabotu, chto napisali dvumja studentami.*  
   most professors read every paper that wrote two students  
   ‘Most professors have read every paper that two students wrote.’

   (i). Intermediate scope: most > two > every [island-escaping]
   (ii). Narrow scope: most > every > two

e. *P'jat' parnej ne mogut podnjat' pianino.*  
   five boys NEG can lift piano  
   ‘Five boys cannot lift a piano.’

(23) Russian Numeral-Noun Phrases: predicative use  
   *Ivan i Anna dva studenta*  
   Ivan and Anna two students  
   ‘Ivan and Anna are two students.’

(24) Russian Numeral-Noun Phrases: restrictors of definites  
   *Eti p'jat' koshek*  
   these five cats  
   ‘these five cats’

(25) Russian Numeral-Noun Phrases: no anaphoric use  
   *Ivan kupil p'jat' sobak i p'jat' koshek.*  
   Ivan bought five dogs and five cats.  
   *(Eti) p'jat' koshek ochen' dorogie.*  
   these five cats very expensive  
   ‘Ivan bought five dogs and five cats; these five cats are very expensive.’

(26) Russian Numeral-Noun Phrases: entity use  
   *Ivan vesit p'jat kilogrammov.*  
   Ivan weigh five kilo  
   ‘Ivan weighs five kilos.’
Although number marking languages differ in how freely they allow bare arguments and how ‘much D’ they have, their bare numeral-noun phrases appear to have identical distributions and interpretations with respect to all of the seven properties considered in the above data set. These facts lead us to the following generalizations.  

(27) Basic generalization from number marking languages:  
i. Bare numeral-noun phrases are always both predicative and argumental.  
ii. In their argumental role, numeral-noun phrases are always indefinites (with peculiar scope and island escaping behaviors).  
iii. They can combine with a definite element/marker and then (and only then) they become definite.  
iv. This is so regardless of whether or not a language has (overt) Ds.

The question is then what would an analysis of these very general facts look like. In the next subsection, I briefly review previous assumptions about, and analyses of, numerals with respect to their semantics and their syntactic status. Based on some of these assumptions, in Section 2.2.3, I will argue for a lexical analysis of bare numerals and a D-less analysis of numeral-noun phrases, which captures the above uniform properties.

2.2.2. Assumptions about the semantics and syntax of numerals

There are three main views about the semantics of numerals. The first view attributes the existential force to numerals as part of their semantics and treats numerals as determiners; under this view, numerals are functions from predicates to generalized quantifiers, of type \(<e, t>,<e, t>,t>>\) (Montague 1974, Bennett 1974, Barwise & Cooper 1981, among others). However, this view of treating numerals as determiners faces various empirical problems (Winter 1997: 407, Ionin and Matushansky 2006: 319-320). In particular, as argued in Ionin and Matushansky (2006: 320), if simple numerals (e.g. two) are determiners of type \(<e, t>,<e, t>,t>>\), then there is no semantic rule for combining two determiners of this type to form a complex numeral like two hundred. Furthermore, combinations of two determiners, such as *the every book, *no these books, are disallowed.

The second view treats numerals as predicates, type \(<e, t>\) (Partee 1986). As in the first view, the semantic composition of complex numerals would fail unless we assume semantic composition of two predicates as conjunction (Heim & Kratzer 1998). However, as Ionin and Matushansky (2006: 321) have argued, treating complex numerals as conjunction yields incorrect truth conditions. Specifically, if we treat complex numerals as conjunction, two hundred books will require ‘books’ simultaneously having the cardinality 100 and the cardinality 2.

The third view, which is the one that I pursue, regards numerals as predicate modifiers, type \(<<e,t>,<e,t>>\) (Link 1987; Verkuyl 1993; Carpenter 1995; Winter 1997, 4

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4 Note that, these properties of numeral-noun phrases are not limited to number marking languages, we also observe them in identical ways in numeral classifier phrases of classifier languages like Mandarin and Nuosu Yi, to be discussed in Section 2.3 and Chapter 4 respectively.
This view of numerals requires the nominals that they combine with to denote a set containing either atoms or sets. Compared with the previous two views, this view has various advantages. To name a few, when occurring with other determiners or in a predicative construction, numerals behave semantically more like adjectives, such as ‘the three/tall girls’; ‘they are three/tall’ (Winter 1997: 406). Empirically, this modifier view is supported by evidence not only from well-studied languages like English, but also from less-studied languages such as Finish, Turkish, Hungarian and Western Armenian (see Ionin & Matushansky 2006, Bale et al 2011 for discussion of these languages). In addition, the semantic type of modifiers enables us to have an analysis of nominal phrases containing complex numerals (e.g. two hundred books) that is both compositional in the semantics and recursive in the syntax (Ionin and Matushansky 2006: 317-319).

Under the predicate modifier view, the semantics of a numeral can be defined as a restrictive adjectival modifier (Link 1983; Ionin and Matushansky 2006; Bale et al 2011, among others):

$$\text{Semantics of numerals: as modifiers (first version)}$$

$$\text{Numerals} = \lambda P \lambda x [n(x) \land P(x)]$$

(28) Semantics of numerals: as modifiers (first version)

Turning now to the syntactic status of numerals, two possibilities are available: as heads ($Num$) or as phrases ($NumP$):

(29) a. NumP  
     Num  XP  

(29) b. NumP  
     NumP  XP


The head analysis of numerals (29a), as discussed above, faces theoretical problems, e.g. there is no semantic rules for combining two determiners for complex numerals if numerals are treated as determiners. In addition, the head analysis is challenged empirically. It has been observed that numerals cross-linguistically can undergo coordination to form complex numerals and can be case-marked in some languages (Ionin and Matushansky 2006, Zabbal 2005, Di Sciullo 2012, among others). For example, coordination of numerals with overt coordinators is attested cross-linguistically, as illustrated in (30) and (31).  

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5 The details of the numeral semantics are negotiable since the core differences among various analyses do not significantly change what I will propose.

6 Note that in Ionin and Matushansky (2006: 340-341) complex cardinals involving addition are treated either as right-node raising or NP deletion, so under their account the coordination is between two numeral phrases containing two NPs, rather than between two cardinals. However, they treat complex cardinals
(30) a. one hundred and two
b. \textit{zweiundzwanzig} (German)
two and twenty
‘twenty-two’
c. \textit{laba iyo toban} (Somali)
two \textit{CONJ} ten
‘twelve’

(31) a. \textit{shi you bai-fen zhi ershi-wu chi} (Mandarin)
ten \textit{CONJ} hundred-part \textit{ZHI} twenty-five feet
‘ten and 25/100 feet’ (Chao 1968: 576)
b. \textit{wu you san-fen zhi er}
five \textit{CONJ} three-part \textit{ZHI} two
‘five and two thirds’

As we can see in (30) and (31), simple numerals may form complex numerals (involving addition or/and multiplication) through conjunction; the coordination between numerals can proceed recursively as with any other phrases. As for case-marking on simplex and complex numerals, I refer the readers to Ionin and Matushansky (2006) and Zabbal (2005) for detailed discussions.

Given the above theoretical and empirical considerations, I pursue the view in (29b) for numerals, treating them as phrases. Such assumptions about numerals as predicate modifiers in the semantics and phrases in the syntax allow for an analysis with compositional semantics and recursive syntax of nominal expressions containing either simplex or complex numerals.\footnote{Further discussions on complex numerals, such as one hundred and sixty, and phrases containing complex numerals will be provided in Chapter 3, Section 3.5.4.}

The analysis of numerals as predicate modifiers in (28) naturally captures two of the cross-linguistic properties of numeral-noun phrases: the predicative use (c.f. (2), (17), (23)) and the use as restrictors of definites (c.f. (3), (18), (24)). I illustrate them in (32) and (33) with examples from English.

(32) a. John, Bill and Tom are \textit{three students}.
b. \([\text{three students}] = \lambda x \ [3 \ (x) \land \text{student} \ (x)]\)
Regarding the structures and the semantic derivations in (32) and (33), there are three points that I will address. First, I adopt the analysis of the canonical number morphology as a head (Div'), along the lines argued in Borer (2005). Such a head (Div') has also been argued to host the Chinese-type classifiers, which I will discuss shortly in Section 2.2.3. Second, I adopt the assumption that bare nouns in English and other number marking languages denote properties, along the lines pursued in Chierchia (1998b; 2010) and Dayal (2004); further discussion on bare nominals in number marking languages will be provided in Chapter 6, Section 6.2. Third, I adopt the analysis that the definite article the in English is interpreted by the iota operator ‘τ’ in the semantics, which shifts properties to arguments with a definite interpretation (33b) (e.g. Sharvy 1980).

In addition to being used in predicate positions and with definite determiners or demonstratives, numeral-noun phrases can also be used in argument positions cross-linguistically, as we saw in Section 2.2.1. The analysis of numeral-noun phrases as
predicates in (32) and (33) is not able to capture their argumental uses. In the following subsection, I will briefly review previous analyses of numeral-noun phrases in argument positions, some of which I will use to argue for a D-less analysis of argumental numeral-noun phrases, i.e. there is no need to assume a null D in the syntax to argumentize the numeral-noun phrases.

### 2.2.3 An D-less Analysis of Numeral-Noun Phrases and An Ambiguity Approach to Numerals

Numeral-noun phrases can also appear on their own, without a definite determiner or a demonstrative, in argument positions. They can receive an indefinite interpretation, exhibiting long-distance scope and island-escaping abilities; they can also receive generic reference in generic sentences (c.f. (4), (5), (6), (16), (22)). Let us first consider their use as indefinites, with long-distance scope and island-escaping abilities. I briefly review previous analyses of their syntax and semantics, based on some of which I will argue for a D-less analysis of indefinite numeral-noun phrases.

Zamparelli (1995, 2000) extends the DP hypothesis in Longobardi’s (1994) work and proposes a two-layer DP hypothesis, in which the higher DP is referred to as ‘StrongDP’ (SDP in short) and the lower DP is referred to as Predicate DP (PDP in short). SDPs are assumed to be the only locus for an interpretation of semantic type $<e>$, and PDPs are assumed to be the locus of quantificational force. The Two-layer DP hypothesis includes three main principles, as shown in (34).

(34) **Main principles in Two-layer DP Hypothesis (Zamparelli 1995, 2000)**
- a. QR principle: all and only non-referential SDPs undergo QR at LF
- b. SD$_{\text{max}}$ presuppositions: a filled SD$_{\text{max}}$ layer triggers presuppositions of existence
- c. Argumenthood Principle: only SDPs can appear in Argument position

(Zamparelli 2000: 119-121)

The two-layer DP hypothesis not only accounts for bare noun phrases without numerals, but also it addresses bare numeral-noun phrases. In particular, numerals are treated as heads and can appear either in the head position of PDP or that of SDP. When numerals are in the head of PDP, they must be interpreted as weak cardinality predicates and cannot be interpreted referentially or specifically (Zamparelli 2000: 239). In contrast, numerals in the head of SDP are strong quantifiers or referential elements. Thus, in argumental numeral-noun phrases (e.g. *John saw two boys*), numerals are determiners, like generalized quantifiers, type $<e,t>,<e,t>,t>$. Zamparelli further explains the scope behavior of numeral-noun phrases with additional semantic assumptions.

This two-layer DP hypothesis not only accounts for the similarities and differences between Germanic languages (e.g. English) and Romance languages (e.g. Italian) with regard to the behavior of their noun phrases, but also it discusses and explains more nominal constructions than those investigated in Longobardi (1994 et seq). The broader empirical coverage and stronger theoretical explanations make Zamparelli’s work important in the literature. Although Zamparelli’s hypothesis mainly focuses on Germanic and Romance languages, there are attempts to extend a modified version of his...
two-layer DP hypothesis to classifier languages like Mandarin, e.g. Liao (2011); however, as we will see shortly in Section 2.3, such attempts face both theoretical and empirical challenges.

Different from the previous DP hypotheses in Longobardi (1994, 2001) and Zamparelli (1995, 2000), Borer’s (2005) analyzes a much wider range of languages from number marking languages to classifier languages and from well studied languages like English and Mandarin to less-studied languages like Armenian and Hebrew. Her analysis of nominal phrases (both noun phrases with numerals and those without) is built on her theory of “Exo-skeletal syntax” which contains the following main assumptions.

(35) Borer’s (2005) Exo-Skeletal Syntax

a. *Encyclopedia* includes lexical elements that lack any categorical or formal features in their entry in the lexicon (e.g. book is a listeme, but the book, booking, booked are not). These features are achieved in the structure.

b. *Functional Lexicon* includes grammatical formatives that come primarily in two varieties: (i) f-morphs (i.e. independent morphemes which are linked with a phonological index, such as the, will, etc.) (ii) abstract head features (e.g. <pst>, etc.), which require the support of some head (L, possibly F), a fact that typically translates to the obligatory nature of head movement in such contexts.

c. *Functional structures* are headed by categorically labeled open values which must be assigned range by the appropriate range assigners.

d. *Open values* are assigned range by a variety of means.

   (i) *Direct* range-assignment: abstract head features (typically involving a movement of the head of L-D (i.e. lexical domain), e.g. English past tense, English plurals), and f-morphs (not involving movement, e.g. English future tense, Kraho creole plurals).

   (ii) *Indirect* range-assignment: external operators (e.g. adverbs of quantification or discourse operator that licenses tense in Chinese) and Spec-head agreement.

e. *Correspondence between a range assignor and an open value*: any open functional value can be assigned range by only one range assignor (e.g. no double marking). However, one range assignor can bind more than one open value.

f. *Parametric variations* are encoded only in *functional lexicon*. The functional lexicon of each language makes available an array of range assigners for specified open values. Functional structure must be (at least up to a point) uniform across language.

g. Variations involve either properties of the Spell-out component (e.g. some languages phonologize certain agreement features, others do not) or the fusion of functional features (e.g. certain kinds of portmanteau and syncreticism effects in Giorgi and Pianesi 1997).

(Borer 2005: 14-85; summarized by Jeong (2005, 2007) with slight modification)
Building on the Exo-Skeletal Syntax, the structure of a functional projection, according to Borer, is assumed to be the one in (36), in which \(<e>_F\) is some functional open value of type \(F\); \(R(F)\) is a range assignor to \(<e>_F\); co-superscriptiong (“2” in this example) notates range assignment.  

(36) Schema of a functional structure

\[
\begin{array}{c}
\text{XP} \\
R^2(F) \\
<e>_F^{\text{min}} \\
\end{array}
\]

(Borer 2005: 45)

Concerning the nominal domain, Borer assumes that the internal structure of nominal arguments has three functional layers above the bare noun (\(N^{\text{max}}\)): classifier phrases (\(\text{CL}^{\text{max}}\)), quantity phrases (\(\#^{\text{max}}\)) and determiner phrases (DPs) and that nominals in all languages share an uniform structure, as shown in (37).

(37) Structure of a nominal domain

\[
\begin{array}{c}
\text{DP} \\
D/<e>_d \\
\#^{\text{max}} \\
\# \\
<e>_{\#} \\
\text{CL}^{\text{max}} \\
<e>_{\text{DIV}} \\
N^{\text{max}} \\
\end{array}
\]

The lowest functional projection, the classifier phrase (\(\text{CL}^{\text{max}}\)) in (37), headed by the open value \(<e>_{\text{DIV}}\) (div. for ‘division’), is assumed to be responsible for portioning out nouns. Plural inflection, overt classifiers, and indefinite articles are assumed to base-generate in the same \(\text{CL}^{\text{max}}\) domain and can accomplish the portioning-out function.

Specifically, in number marking languages with overt determiners, such as English, both plural inflection and the indefinite determiner (e.g. \(a/an\) in English) can assign range to the open value \(<e>_{\text{DIV}}\) and accomplish the portioning-out function. In classifier languages like Mandarin, it is the classifiers that assign range and accomplish that function. (Borer 2005: 93). Thus, numeral-noun phrases in English and Mandarin numeral classifier phrases share the same structure. I illustrate it with two examples in (38a) and (38b); they share the same structure in (39).

---

Note that, the range assignor \(R(F)\) may merge with some higher open value, assigning range to it.
An key element in Borer’s nominal structure is that plural inflection is classifier inflection. Specifically, plural inflection is assumed to be a distinct instantiation of the classifier system and appear in the same position as classifiers. As a consequence, ‘not only is it the case that classifier languages do not (appear to) have plural inflection, but languages which mark plural do not appear to have classifier inflection’ (c.f. Borer 2005: 92). This prediction by Borer is stronger than the one-way prediction made by Chierchia (1998b) that classifier languages do not (appear to) have plural inflection. The main motivation for this prediction is from the observation that classifier inflection and plural inflection appear in complementary distribution made by T’sou (1976) (Borer 2005: 93). I will elaborate on this issue in Section 2.3 as well as in Chapter 3, Section 3.5.12

12 Regarding Language variation, according to Borer, it mainly lies in the arrange assigners and how the open value of each head is assigned. For instance, in languages with overt Ds like English, the definite determiner can assign range to the head of DP, $\#^{\text{max}}$ (and possibly to $\text{Cl}^{\text{max}}$ as well) (e.g. Borer 2005: 164). In some CLs like Cantonese, classifiers can also assign range to D via movement from within the $\text{Cl}^{\text{MAX}}$ domain to the DP domain (e.g. Borer 2005: 186). Hence, although on the surface we observe a determiner-noun phrase (ia) and a classifier-noun phrase (ib), they are the same in the syntax as a DP (ii).

(i) a. the book
b. bun syu

(English)
(Cantonese)

Cl volume book
‘the book’

(ii) a. [DP the \(\langle e\rangle_d \[\text{NP} \langle e\rangle_{\text{DIV}(0)} \langle \text{NP} \text{book} \rangle]\)]
b. [DP bun \(\langle e\rangle_d \[\text{NP bun} \langle e\rangle_{\text{DIV}(0)} \langle \text{NP syu} \rangle]\)]

(Borer 2005: 164, with slight modification)

I will address issues on language variation in Part III of this book.
In this work, I adopt Borer's analysis that overt classifiers and plural inflection appear in the same position. I also argue for an uniform structure of numeral containing phrases across languages; however, the uniform structure to be argued for is not a DP but a D-less structure, to be presented shortly.

Turning now to the semantics of indefinite numeral-noun phrases. Some authors treat numerals as determiners of type \(<<e,t>;<<e,t>,t>>\) (Bennett 1974; Scha 1981; van der Does 1992, 1993 among others). Such an analysis of numerals attributes their existential force to the numeral semantics. However, we saw that treating numerals as heads faces both theoretical and empirical problems (c.f. Section 2.1.2). More importantly, the exceptional long-distance scope property and the island-escaping ability of indefinites requires an analysis of which is distinguishable from standard quantification (Kratzer 1996; Reinhart 1997; Winter 1997).

An analysis of indefinites in terms of choice functions has been pursued in Kratzer (1996), Reinhart (1997), and Winter (1997, 2001, 2005), which captures their island-escaping abilities. In these works, indefinite numeral-noun phrases are analyzed on a par with \(a\)/some indefinites, which are assumed to lack quantificational force of their own. Specifically, indefinites are assumed to involve a free function variable in their semantics that assigns an individual to the restriction of the predicate (c.f. Winter 1997: 409; see also Reinhart 1997); this function is a choice function that is existentially closed. A choice function, according to Reinhart (1997) and Winter (1997: 409), can be informally understood as a function that chooses any member from any non-empty set. Furthermore, the quantificational procedure introduced by the choice function is assumed to apply at any compositional level (see Winter 1997: 409-411 for details). For instance, for ‘three students’, the choice function which is existentially closed at any compositional level, applies to the set denoted by the nominal and picks from it a plurality consisting of three individuals each of which is a student; this plural individual is argumental, of type \(<e>\).

I illustrate this with an example to show how the choice function analysis in Reinhart (1997) and Winter (1997) works for indefinite numeral-noun phrases. In the sentence in (13), (repeated in (40)), if the existential closure of the choice function is performed within the antecedent adjunct clause (40ia), the narrow scope interpretation is obtained and can be paraphrased as (40ib). If the existential closure is performed outside the conditional (40iia), it gives rise to a wide scope reading paraphrased as (40iib), where \(CH(f)\) means that \(f\) is a choice function.

\[
(40) \quad \text{[If one woman comes to the party] John will be glad.}
\]

(i). Narrow scope reading
   a. \([\exists f [CH(f) \land \text{come}(f(\text{woman}))]] \rightarrow \text{glad}(\text{John})]\)
   b. John will be glad if there is any possibility to pick a woman who comes to the party.

(ii). Wide scope reading
   a. \([\exists f [CH(f) \land \text{[come}(f(\text{woman})))] \rightarrow \text{glad}(\text{John})]\]
   b. There is a choice function such that John will be glad if the women it picks comes to the party. \(\text{(Winter 1997: 411)}\)
Very crucially, the interpretation of the indefinite is determined by the stage at which existential closure is applied, and in both cases in (40) no mechanism extracts the indefinite numeral-noun phrase one women out of the island (c.f. Winter 1997: 411). Thus there is no island constraint violation under the choice function analysis.

The choice function analysis of indefinites enables the existential closure of choice functions to apply at any stage of the compositional derivation; it thus captures their long-distance scope ability. I will adopt the choice function analysis of numeral indefinites, because it not only provides a uniform account of different indefinites (a-, some-, and numeral indefinites), but also it captures the long-distance scope behavior of numeral-noun phrases cross-linguistically (we will see further empirical evidence from Mandarin in Section 2.3 and from Nuosu Yi in Chapter 4). I refer the choice function variable that is subject to existential closure as ‘f\*’.

A question immediately arises for this choice function analysis, namely, where and when exactly is the choice function introduced in the numeral-noun phrases? Some authors assume that the choice function is linked to some functional head, e.g. a null D (as pursued in Winter 2001, 2005; Ionin and Matushansky 2006 for English). Here I will pursue a different approach and propose a simple-minded lexical analysis that attributes the choice function to numerals as part of their semantics: numerals come with a built-in choice-function variable (see also Dayal 2012, 2014 for a similar view). Specifically, numerals first look for properties, and the choice function variable introduced in numerals, which needs to be existentially closed, then applies to the numeral-modified properties. I demonstrate this lexical view of choice function of numerals in (41).

(41) A lexical view of choice functions which is subject to \(\exists\)-closure (f\*).
   a. Numerals:\(\langle e, \tau, e\rangle = \lambda P F_{f^*}(\lambda x [(n(x) \land P(x))])\)
   b. D-less analysis of indefinite Numeral-Noun Phrases

The structure of indefinite numeral-noun phrases (41b), under the proposed lexical analysis of the choice function, is the same as that of the predicative numeral-noun phrases (32c).

I consider one empirical argument and one theoretical argument for this lexical view of choice functions and the D-less analysis of indefinite numeral-noun phrases.

Its empirical motivation comes from the remarkable cross-linguistic properties of numeral-noun phrases that we saw in Section 2.2.1: they can freely appear in argument positions with an indefinite or a generic reference across languages regardless of whether a language is a number marking language or a classifier language and also regardless of whether a language has overt Ds or not.

Take number marking languages first. Numeral-noun phrases are freely argumental in languages where no evidence of overt D is detected, such as Russian; they
are also freely argumental in strict DP languages where bare arguments are banned and determiners must always occur with bare nominals, as in French.

Looking into French; bare nominals are turned to arguments obligatorily via an overt D regardless of whether they are bare singulars, bare plurals or mass nouns. For example, in (15) (as repeated in (42)), the bare plural *baleines* ‘whales’ cannot appear in argument position without the determiner *les* ‘the’ even if the definite D does not directly contribute to its interpretation as kinds (42a).

(42) *(Les) baleines sont en train de disparaître.* (French)
the whales are in train of disappear
a. ‘Whales are becoming extinct.’
   b. ‘the set of sub-species of whales is becoming extinct.’
   (Vergnaud and Zubizarreta 1992: 635)

Nevertheless, even in a language that strictly disallows bare nominals without D like French; its numeral-noun phrases still can freely appear in argument positions without a determiner. French numeral-noun phrases also display all other cross-linguistic properties. Examples are repeated below.

(43) French argumental numeral-noun phrases
   a. *Deux garçons peuvent soulever un piano.*
      two boys can raise a piano
      ‘Two boys can lift a piano.’
   b. *J'ai vu deux chiens.*
      I saw two dogs
      ‘I saw two dogs’
   c. *Il y a deux chiens.*
      there are two dogs
      ‘There are two dogs’
   d. *Si tu apportes deux filles à la fête, j'en serai heureux.*
      if you bring two girls to the party I will be happy
      ‘If you bring two girls to the party I will be happy’ two > if or if > two
   e. *La plupart des professeurs ont lu chaque essai.*
      the most professors have read every essay
      que deux étudiants ont écrit
      that two students have written
      ‘Most professors have read every paper that two students wrote.’
      most > two > every or most > every > two

The fact that the remarkable cross-linguistic argumental behavior of numeral-noun phrases is still detected in a strict D language like French suggests that numeral-noun phrases must have a different source to form arguments than bare nominals.

Look at another numeral marking language Russian. As we have seen in Section 2.2.1, numeral-noun phrases in such a language that has no overt evidence of D manifest the same properties as their counterparts in other number marking languages with overt D
Russian argumental numeral-noun phrases
a. Piat' parnej ne mogut podnjat' pianino.
   five boys NEG can lift piano
   ‘Five boys cannot lift a piano.’

b. V komnate p'iat' sobak.
   in room five dogs
   ‘There are five dogs in the room.’

c. Ja videla p’iat’ sobak.
   I-nom see.past five dogs
   ‘I saw five dogs’

d. Ja budu schastliv, esli ty pridjosh’ na vecherinku s dvumja devushkami.
   I be.fut happy if you come on party with two girls
   ‘If you bring two girls to the party, I will be happy.’
   [two>if] or [if>two]

e. Bol’shinstvo professorov prochitali kazhduju rabotu chto napisali dva studenta.
   most professors read every paper that wrote two students
   ‘Most professors have read every paper that two students wrote.’
   [most>two> every] or [most > every >two]

Similarly, in classifier languages, numeral classifier phrases which contain a numeral, a classifier and a noun, are freely allowed in argument positions with either an indefinite or a generic interpretation; the same long-distance scope property is detected in languages without overt D, such as Mandarin (as we will see shortly in Section 2.3) as well as in languages with overt D, such as Nuosu Yi (as we will see in Chapter 4).

Regardless of how much languages may differ with respect to argument formation of their bare nominals (e.g. obligatorily via an overt D, optionally via an overt D, or not through an overt D), they uniformly allow bare numerals containing phrases to appear in argument positions with the same properties. These remarkable cross-linguistic properties of numeral-containing phrases need to be acknowledged; the uniform argumental behavior of numeral containing phrases across languages suggests that numeral-containing phrases must have a different source to form arguments from bare nominals which vary cross-linguistically.

Turning to the theoretical consideration of the lexical view of numerals and the D-less analysis of numeral indefinites, it provides a uniform analysis of the cross-linguistic behavior of bare numeral containing phrases. The choice function, which is built into the lexical entry of numerals and contributes to the long-distance scope interpretation, and is not subject to the existence of any functional head (e.g. D) which might be subject to parameterization. This lexical view, therefore, can reduce unnecessary theoretical
assumptions and parameterization in the narrow syntax concerning numeral-containing phrases, helping us to maintain a minimalist fashion of linguistic inquiry.

Admittedly, one can accommodate the choice function variable in the syntax. For example, one can assume that the choice function is linked to some functional head (which might be subject to parameterization), e.g. a null D (as pursued in Winter 2001, 2005: 770; Ionin & Matushansky 2006: 322 for English). If we pursue this syntactic analysis of the choice function variable, we then need to make other assumptions as to where the choice function variable is realized in languages without such a functional head (i.e. languages without Ds). Even if we assume that languages without overt determiners also project null DPs in the syntax, we then need to explain why bare nouns, such as English dogs, do not have the same scope behavior as bare numeral phrases like two dogs since they might as well be argumentized via a null D. As we know, bare nominals differ from ordinary indefinites in that the former allows only narrow scope indefinite readings, while the latter participates in scope interaction (see e.g., Carlson 1977a, b), as illustrated below.

(45)  
a. Miles wants to meet policemen.  
want > \exists*\exists > want  
b. Miles wants to meet a policeman.  
want > \exists\exists > want  
c. John didn’t see spots on the floor.  
\neg > \exists*\exists > \neg  
d. John didn’t see a spot on the floor.  
\neg > \exists\exists >  
(Carlson 1977b: 16, 19)

Of course, one can further assume two types of null Ds: one is linked to the choice function variable and merges with bare numeral-containing phrases, leading to the long-distance scope behavior; the other merges with bare nouns and only contributes to the narrowest existential reading (e.g. the Longobardi’s (1994) style of null D). However, such a parametric approach of null Ds not only doesn’t show advantage over the lexical approach to numerals, but also it inevitably add unwanted stipulations and complications in the syntax. 13

Regardless of what assumption about numeral-(classifier)-noun phrases one makes, it has to capture their uniform argumental behavior across languages as well as their long-distance scope ability. The proposed lexical analysis of choice function straightforwardly captures this cross-linguistic uniformity; it also shows theoretical advantages over a null DP analysis which inevitably would be more stipulative. Regarding the implementation in the syntax, we can view that an agreement relation exists between the abstract existential closure \exists and the choice function in the lexical entry of numerals (e.g. analogous to the analysis of negative concord in Zeijlstra 2004).

13 A potential question may arise here, namely, why the source of choice functions cannot be a covert semantic operation like type-shifting. This semantic assumption is theoretically plausible. However if we allow such a covert semantic operation for NCs in French, say, one would like to know why it is not available for bare nouns. Admittedly, one can always make some assumptions to explain this puzzle; however, we believe that adding further assumptions would inevitably result in a more stipulative theory than the proposed lexical analysis.
Consequentially, under the proposed lexical analysis of choice functions, numerals have a predictable lexical variant in which they are property modifiers, as demonstrated in (46).

\[(46)\]
\[
\text{Lexical view of ambiguous numerals}
\]
\[
a. \text{Numeral}_{<e,t>,<e,t>} = \lambda P \forall x \left[ n(x) \land P(x) \right]
\]
\[
b. \text{Numeral}_{<e,t>,e} = \lambda P \exists x \left[ n(x) \land P(x) \right]
\]
\[
\text{If } [[\alpha]] \in \text{Num}_{<e,t>,<e,t>}, \text{ then } \lambda P f_3(\lambda x \left[ n(x) \land P(x) \right]) \in \text{Num}_{<e,t>,e}
\]
\[
f_3 \text{ is subject to existential closure at arbitrarily chosen scope sites.}
\]

In addition to allowing us to account for the island-escaping and long-distance behavior of numeral-noun phrases as well as their indefinite interpretation, the proposed lexical view of choice functions also allows us to derive a generalized quantifier (GQ) variant of numeral-noun phrases. If considering the Principle of Same-Type Coordination in Partee 1987, i.e. only categories of the same semantic type can be coordinated, the phrase ‘three boys’ in (41) which coordinates with a GQ ‘every girl’ must also be regarded as a generalized quantifier, type \(<<e,t>,t>\).

\[(47)\]
I met with [three boys and every girl].

With regard to the GQ use of numeral-noun phrases, it is widely assumed that the quantificational force of numerals is related to their modifier use. The quantificational force can be assumed to be gained via a global existential closure (Heim 1982), a covert existential quantifier (Link 1983, 1987, Krifka 1999), a type-shifting principle (Partee 1986, Landman 2003), or simply via our lexical analysis of choice function. I remain agnostic as to how exactly this quantificational force of numerals is obtained, but the proposed lexical analysis of choice functions is still compatible with any standard view one would adopt.

Now let us turn to the generic interpretation of numeral-noun phrases in argument positions; some examples are repeated below.

\[(48)\]
\[
a. \text{Three boys} \text{ can lift the piano.}
\]
\[
b. \text{Two canaries} \text{ can be kept in the same cage if it is large enough.}
\]
\[
c. \text{Two magnets} \text{ either attract or repel each other.}
\]
\[
d. \text{Six apples} \text{ cost one dollar.}
\]

(Krifka et al 1995: p. 35-55, with slight modification)

The sentences in (48) all report a general property of the numeral-noun phrases; these sentences are referred to as ‘generic sentences’ (or ‘characteristic sentences’) as in Krifka et al (1995: 2-3). For instance, ‘three boys’ in (48a) does not refer to three specific boys or any three boys in a particular event. Instead, the sentence expresses a statement over events and reports a property of any three boys in general, namely, ‘generally, any three boys can lift a piano’.
Generic sentences contrast with sentences that express statements about particular events and properties of particular objects, which are generally referred to as ‘episodic sentences’ (Krifka et al. 1995). In (49), the two sentences are episodic, describing specific episodes or isolated facts; the two phrases ‘three boys’ and ‘two canaries’ have referents within their particular events.

(49)  
a. Three boys are lifting a piano.  
b. Two canaries were kept in the same cage yesterday.

Regarding what contributes to the generic quality of the numeral-noun phrases in generic sentences, Krifka et al. (1995: 14-21) argue that ‘the locus of the genericity in generic sentences is not in the nominal subject but rather in the sentence itself’. The authors show that generic sentences put no restriction on what types of nominal phrases may occur in them. For examples, in English, all of the following NPs can participate in generic sentences: proper names, indefinite NPs, definite singular NPs, quantified NPs, bare plural NPs and bare singular NPs (Krifka et al. 1995: 8). Some examples are given below.

(50)  
Different types of nominals in generic sentences  
a. John/My brother drinks Whiskey 
b. Every Professor drinks whiskey. 
c. The Italian drinks whiskey. 
d. Professors drink whiskey. 
e. Milk is healthy. 
f. A cat is hungry when it meows. 
g. Six apples cost one dollar

(Krifka et al. 1995: 8-55, with slight modification)

The variety of nominals acceptable in generic sentences makes it implausible that this type of genericity is conditioned by the meaning of an NP.

As for how genericity arises, it has been assumed that the generic meaning is contributed by an operator Gen; this operator quantifies over situations as well as objects (Lawler 1972, Schubert and Pellitter 1989). Generally, the Gen operator can be viewed as a universal quantifier (\(\forall\)) quantifying over situations or possible worlds (e.g. see Kratzer 1981, Chierchia 1995; Krifka et al. 1995); this is the view that I adopt for the semantics of generic sentences.

Syntactically, this Gen operator needs to be located in a structurally high enough position to quantify over both the external argument and the internal argument. Accordingly, it should be introduced at a position above vP (assuming the VP-internal Subject Hypothesis; see, e.g., Koopman and Sportiche 1991); this leaves us with limited choices: to merge Gen with IP or to merge Gen with TP, AspP or ModP (with the canonical assumptions that all of these phrases are located above vP, and with the split IP

---

14 This reference to situations is similar to Carlson’s 1977 references to states.
analysis). Here I will simply assume that the Gen operator merges with IP without going into details as to which projection within IP Gen exactly merges with since it does not make much difference for the purposes of the current discussion (or see Chierchia 1995 for the assumption that Gen merges with AspP). By merging in a high enough position, the Gen operator can quantify over the numeral-noun phrases in both the external and internal argument positions in generic sentences. I illustrate the structure and the semantics of generic sentences with the example in (51) (with irrelevant details omitted).

(51)  

\begin{itemize}
\item a. *Three boys* can lift a piano.
\item b. $\forall x, s \ [\text{ACC}(s_0, s) \land 3(x) \land \text{student}_x(x) \land C(x,s)][\text{lift}_x(x, \text{a piano})]$
\item c. $\text{Gen}(\forall) \rightarrow \text{IP}$
\end{itemize}

To summarize Section 2.2, we observed a series of tendentially universal properties of numeral-noun phrases in number marking languages: (i) numeral-noun phrases are systematically ambiguous (in the Universal Lexicon) between a predicate and an indefinite variant, (ii) in their indefinite incarnation, they are arguments with long-distance scope properties, (iii) in their predicate incarnation, they act as restrictors of Ds, demonstratives, quantifiers and the generic operator, and (iv) Properties i—iii are stable, regardless of whether a language has (overt) D or not. I argued for a lexical analysis of numerals, namely that numerals are lexically ambiguous between a modifier and a modifier with a built-in choice function variable. I showed that this analysis of numerals allows us to capture the remarkable uniform properties of numeral-noun phrases across languages. It is conceivable that these properties can be explained in different ways, but this simple lexical approach of numerals suffices regardless of whether the language has...
a (overt) D or not. In the Section 2.3, I will show that this lexical analysis of numerals suffices for Mandarin, a classifier language, as well.

### 2.3 Reexamining Bare Numeral Classifier Phrases in Mandarin

#### 2.3.1 Similarities and Differences between Mandarin and Number Marking Languages in the nominal internal domain

Mandarin numeral classifier phrases share some similarities with numeral-noun phrases in number marking languages, such as English and French, with respect to their internal structure.\(^{17}\) For instance, in English, the plural number marking -\(s/-\text{es}\) is obligatory when a numeral (other than ‘one’) combines with a count noun. Although Mandarin does not have the same canonical number marking as English, it has classifiers, which are also obligatory when a numeral combines with a noun. This similarity is shown in (52) and (53). Without the plural morphology -\(s\) and without the individual classifier ‘\(ge\)’ (as defined and discussed in Chapter 1), both (52a) and (53a) are ungrammatical.\(^{18}\)

\[
\begin{align*}
(52) & \quad \text{a. * three student} & \text{b. three students} \\
(53) & \quad \text{a. * san xuesheng} & \quad \text{b. san ge xuesheng (Mandarin)} \\
& \quad \text{three student} & \quad \text{three Cl student} \\
& & \quad \text{‘three students’}
\end{align*}
\]

Setting aside the above similarity, number morphology and classifiers are quite different in other respects. For illustrative purposes, I will use English to demonstrate their differences, but very importantly, variation among number marking languages (e.g. among English, French and Russian) is also observed, which I will address in Chapter 6.

The first difference shows up when the numerals are removed from the nominal domain. When numerals are absent, number morphology still can mark count nouns, e.g. \textit{books}. Bare plural \textit{Ns} in English can \textit{freely} occur in argument positions (c.f. Section 2.2.1).\(^{19}\) However, in Mandarin, only when the numeral \textit{yi} ‘one’ is absent can the bare classifier noun phrase, \([\text{Cl N}]\), be allowed in very restricted argument positions.

For example, compare the English bare plural \textit{students} in (55a) with the Mandarin [\text{Cl N}] phrase \textit{ge xuesheng} ‘Cl student’ in (56a), the former can \textit{freely} appear in the

\[\quad \text{Setting aside the above similarity, number morphology and classifiers are quite different in o}\]

---

\(^{17}\) As noted in fn. 1, ‘number marking languages’ in this work refers to standard number marking languages such as Romance and Germanic languages where number morphology is obligatory when a numeral (except for ‘one’) combines with any count noun. Number marking languages here do not include languages like Turkish, Hungarian or Western Armenian, which have number morphology on bare nouns without the occurrence of numerals but \textit{ban} number morphology or optionally allow it on nouns when they appear with a numeral.

\(^{18}\) A number of authors establish a connection between the number morphology and the classifier (Greenberg 1972; Sanches and Slobin 1973; T’sou 1976; Doetjes 1996; Chierchia 1998b; Cheng and Sybesma 1999; Borer 2005, among others). I will address this issue in Section 2.4.1.

\(^{19}\) In other number marking languages like Russian, bare plural \textit{Ns} can also freely occur in argument positions, but they cannot do so in some other number marking languages like French (c.f. (15), (21)).
external argument position, but the latter cannot. Similarly, English bare plurals can freely appear in the internal argument position (55b), but the bare classifier phrase in Mandarin cannot do so (56b). Only in extremely restricted positions, e.g. in certain post-verbal positions, bare classifier phrases in Mandarin are allowed (56c) (e.g. Lü 1944; Chao 1968; Yang 2001). I will further discuss the [Cl N] phrase in Mandarin in Section 2.7, where I argue that this phrase is not driven by the syntax but by semantic and prosodic factors (e.g. Lü 1944; Li and Feng 2013).

(54) a. students b. ge xuesheng
   Cl student

(55) a. Students should study hard.
   b. I bought cats, dogs and rabbits.

(56) a. *ge xuesheng yinggai haohao xuexi. (Mandarin)
   Cl student should good-good study
   Intended: ‘A/The student should study hard.’
   b. *wo mai le zhi mao, tiao gou he zhi tuzi.
      I buy ASP Cl cat, Cl dog and Cl rabbit
      Intended: ‘I bought a/the cat, a/the dog and an/the rabbit.’
   c. wo mai le zhi mao.
      I buy ASP Cl cat
      ‘I bought a cat.’

When both numerals and number morphology/classifiers are absent together, we observe another difference between number marking languages and Mandarin. In English, bare nouns without number morphology and without numerals (e.g. student) cannot occur as bare arguments (c.f. Section 2.2.1). Examples from English are given in (58). Interestingly, bare nouns in Mandarin without numerals and classifiers are grammatical expressions with different interpretations (e.g. Chao 1968; Cheng and Sybesma 1999; Yang 2001; X. Li 2011, 2013) (57b), and they can always merge directly with a verb and occur freely as bare arguments (59).

(57) a. student b. xuesheng
    student
    ‘(the) students/ the student’

(58) a. *Student should study hard.
    b. *I bought cat, dog and rabbit.

---

20 While bare nouns without number morphology and with numerals cannot occur as bare arguments in English as well as in English, they can do so in Russian, as we saw in (21). Discussions on variation among number marking languages will be provided in chapter 7.
(59)  a. xuesheng yinggai haohao xuexi. (Mandarin)
    student should good-good study
    ‘Students should study hard.’

    b. wo mai le mao, gou he tuzi.
    I buy ASP cat, dog and rabbit
    ‘I bought (the) books, (the) dogs and (the) rabbits/ the cat, the dog and the rabbit.’

    c. wo mai le shu.
    I buy ASP book
    ‘I bought (the) books/the book.’

Furthermore, number morphology is number specific, i.e. it either singular or plural (60a), but classifiers are not, i.e. they remain the same regardless of singularity or plurality (60b).

(60)  a. one student/two students
     b. yi/liang *(ge) xuesheng
        one/two Cl student
        ‘one student/two students’

The last difference between number morphology and classifiers is that the classifier system is rich (e.g. there are various different types of classifiers as we saw in Chapter 1), and classifiers are not treated as bound morphemes like -s/-es in Mandarin, as shown below.

(61)  a. san  ge  ren
      three  Cl individual  person
      ‘three persons’

      b. san  zhi  bi
      three  Cl individual  pen
      ‘three pens’

      c. san  bang  yingtao
      three  Cl pound  cherry
      ‘three pounds of cherries’

The above discussions on number marking morphology and classifiers have shown to us that there are internal differences between numeral-containing phrases in canonical number marking languages and those in classifier languages, even though they do share some similarity.

In the following section, I provide data from Mandarin and aim to show that regardless of their various differences within the nominal domain, numeral classifier phrases in Mandarin and numeral-noun phrases in number marking languages behave similarly at the clausal level with regard to their scope behavior. In particular, I will show that Mandarin numeral classifier behave like (numeral) indefinites in number marking languages: they can receive a wide scope interpretation and exhibit the island-escaping ability; moreover, they can also receive an intermediate scope, just like (numreal)
indefinites in English. In Section 2.3.3, I further show that numeral containing phrases in Mandarin and those in number marking languages are also similar with respect to interpretation and distribution.

2.3.2 Long-distance scope behavior of Mandarin numeral classifier phrases

In the literature, it is generally assumed that Mandarin does not exhibit scope ambiguity (e.g. S.F. Huang 1981; J. Huang 1982; T. Lee 1986). But concerning the scope behavior of Mandarin numeral classifier phrases, J. Huang (1982: 214-220) has observed that they can escape from islands (complex NP islands specifically) to undergo QR. One of his examples is given in (62).

(62) wo mai-le [NP [ san ge ren xie ] de mei ben shu]
I buy-ASP three Cl man write MOD every book
(i) Wide Scope: ‘There are three men x such that every book x wrote I bought.’
(ii) Narrow Scope: ‘I bought every book that three men wrote.’

(J. Huang 1982: 214)

In (62), the numeral-classifier phrase san ge ren ‘three Cl men’ can either receive a wide scope reading out of the complex NP without violating island constraints or receive a narrow scope reading within the complex NP.

In addition to escaping from the complex NP islands as observed in J. Huang (1982), numeral classifier phrases are also able to escape from other islands. An example involving an adjunct clause is given below.

(63) [ruguo ni neng dai yi ge xuesheng lai wo-de party de-hua],
if you can bring one Cl student come my party if
wo hui hen kaixin.
I will very happy
‘If you can bring one student to my party, I will be very happy.’
(i) Wide scope: one student > if
‘There is a specific girl, if you can bring this student to my party, I will be very happy.’
(ii) Narrow scope: if > one student
‘I will be very happy if you can bring any student to my party.’

As with numeral-noun phrases in number marking languages, numeral indefinites in Mandarin can also receive either a wide scope or a narrow scope interpretation with respect to a quantifier c-commanding it. Aoun and Li (1989: 142, 1993a: 12) observe that numeral classifier phrases in passive sentences allow both a narrow scope interpretation and a wide scope interpretation with respect to a universal quantifier (see also Jiang 2012: 110-113, 191; A. Li 2014: 231), as illustrated below.
(64)  a. mei-ge ren dou bei yi-ge nüren zhuazou le.
every-Cl man all by one-Cl woman arrested
‘Everyone was arrested by a woman.’ \( \forall > \exists, \exists > \forall \) (Aoun and Li 1989: 142)

b. mei ge youke dou bei yi ge xiao guniang
every Cl vistor dou PASSIVE one Cl little girl
hoodwink buy ASP one Cl cell-phone
Lit: ‘Every visitor was hoodwinked to buy a cell phone by a little girl.’
\( \forall > \exists, \exists > \forall \) (Jiang 2012: 191)

c. mei ge xuesheng dou bei yi ge pianzi pian le liang-qian kuai.
every Cl student dou PASSIVE one Cl swindler con ASP two-hudrend Yuan
Lit: ‘Every student got conned out of two thousands Yuan by a swindler.’
\( \forall > \exists, \exists > \forall \)

In each example in (64), the universal quantifier c-commands the numeral classifier phrase, but the numeral classifier phrase still can receive a wide scope interpretation.

F. Liu (1997: 54-57) and X. Li (2011: 63) further observe that in active sentences Mandarin singular numeral indefinites also behave like English indefinites in allowing both a narrow scope interpretation and a wide scope interpretation with respect to a universal quantifier:21

(65)  a. suoyou de laoshi dou jide yi ge xuesheng.
all NOM teacher all remeber one Cl student
’All of the teachers remember one student.’ \( \exists > \forall, \forall > \exists \)

\[\]

21 Aoun and Li (1989: 142) mark a canonical active sentence with a subject QP interacting with an object QP as unambiguous (i); however, A. Li (2014: 242, fn. 29) notes that when the context is clear, the numeral classifier phrase can refer to a specific individual, receiving a wide scope interpretation (ii).

(i) mei-ge-ren dou xihuan yi-ge nüren.
every Cl like one-Cl woman
‘Everyone loves a woman.’ \( \forall > \exists, \exists > \forall \) (Aoun and Li 1989: 141; A. Li 2014: 231)

(ii) women ban de mei-ge xuesheng dou xihuan yi-ge muqian zui hong de gexing.
we class DE every-Cl student all like one Cl most hot DE singer
‘Every student in our class likes a singer that is hottest now.’ \( \forall > \exists, \exists > \forall \) (A. Li 2014: 242)

Aoun and Li (1989: section 5.3) further note a contrast between dative and double object constructions with regard to the interpretation of numeral indefinites (see also S. Huang 1996; A. Li 2014).

(iii)  a. wo song yi-ben shu gei mei-ge-ren.
I give one-Cl book to every-Cl-one
‘I gave a book to everyone.’
\( \exists > \forall, \forall > \exists \)

b. wo song yi-ge ren mei-ben shu.
I give one-Cl person every-Cl book
‘I gave a person every book.’

The scope freezing effect of numeral indefinites in double object constructions (iiiib) is not unique to Mandarin but also attested in English as well as other languages (e.g. see Larson 1988, 1990, Aoun and Li 1993a, Marantz 1993; Bruening 2001, 2010; Antonyuk 2015).
b. *zai women xuexiao mei ge xuesheng dou dei xiu yi men yanshuo ke.*
In our school each Cl student all have:to take one Cl speech class
’In our school every student has to take a speech class.’ \( \exists \forall, \forall \exists \)
(F. Liu 1997: 57)

c. *mei ge ren dou zai kan yi feng guanyu jiaxin de xin.*
every Cl man all PROG read one Cl about add-salary MOD letter
‘Everybody is reading a letter about raising salaries.’ \( \exists \forall, \forall \exists \)
(X. Li 2011: 63)

On the top of the above observations, we observe that, the same as numeral-noun phrases in number marking languages (c.f. (12), (16), (22d)), numeral classifier phrases in Mandarin can escape islands without having the widest scope, i.e. they can receive an intermediate scope interpretation, which is a unique property of indefinites, as we saw in Section 2.2.1. In all examples below, a universal quantifier c-commands a complex NP which contains a numeral classifier phrase, and another quantifier phrase ‘most’ is above the universal quantifier. We detect an intermediate scope interpretation of the numeral classifier phrase, scoping over ‘every’ but under ‘most’ (Jiang 2012: 110-113).

(66) a. *dabufen laoshi dou anwei le [mei yi ge most teacher DOU console ASP every one Cl [bei yi ge pinazi pian le qian] de xuesheng] PASSIVE one Cl swindler con ASP money MOD student*
Lit: ‘Most teachers consoled every student who was conned out of money by a swindler’
(i) Intermediate scope: [most teacher > one swindler > every student]
‘For most teachers, there is a specific swindler that they consoled every student who was conned out of money by this swindler.’
(ii) Narrow scope: [most teacher > every student > one swindler]
‘For most teachers, they consoled every student who was conned out of money by any swindler.’

b. *dabufen mianshiguan dou zancheng taotai [mei yi ge most interviewee dou agree eliminate every one Cl [bei yi ge xiaoxue ti-mu nandao (le)] de yingzheng-zhe] PASSIVE one Cl elementary-school question baffle ASP MOD applicant*
Lit: ‘Most interviewees agreed to eliminate every applicant who was baffled by one elementary school assessment question.’
(i) Intermediate scope: most interviewee > one question > every applicant
‘For most interviewees, there is a specific elementary school assessment question that they agreed to eliminate every applicant who was baffled by this question.’
(ii) Narrow scope: most interviewee > every applicant > one question
‘For most interviewees, they agreed to eliminate every applicant who was baffled by any elementary school assessment question.’
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c. *da-bufen laoshi dou jian-le [mei yi ge* most teacher dou meet-ASP every one Cl
[bei san suo changgingteng daxue luqu le] De xuesheng].

PASSIVE three Cl Ivy League college admit ASP MOD student.
Lit: ‘Most teachers have met every student who was admitted by three Ivy League schools.’

(i) Intermediate scope: most teachers > three Ivy League schools > every student
‘For most teachers, there are three specific Ivy League schools that they have met every student who was admitted by these three schools.’

(ii) Narrowest scope: most teachers > every student > three Ivy League schools
‘For most teachers, they have met every student who was admitted by any three Ivy League schools.’

Similar examples are given in (67), in which an *intermediate* scope interpretation of the numeral classifier phrase, scooping over the closest ‘every’ but under the sentence initial ‘every’, is available.

(67) a. *mei ge laoshi dou anwei le [mei yi ge* every Cl teacher DOU console ASP every one Cl
[bei yi ge pinazi pian le qian] de xuesheng] PASSIVE one Cl swindler con ASP money MOD kid
Lit: ‘Every teacher consoled every student who was conned out of money by a swindler’

(i) Intermediate scope: every teacher > one swindler > every student

(ii) Narrow scope: every teacher > every student > one swindler

b. *mei ge laoshi dou anwei le [mei yi ge* every Cl teacher DOU console ASP every one Cl
[bei yi ge xiao-hunhun xia ku le] de haizi] PASSIVE one Cl young-gangster threat cry ASP MOD kid
Lit: ‘Every teacher consoled every student who was threatened to cry by a young gangster.’

(i) Intermediate scope: every teacher > one young gangster > every student

(ii) Narrow scope: every teacher > every student > one young gangster

Furthermore, numeral indefinites can take both wide and narrow scope over another numeral indefinite above them. Take the sentence in (68) for an example, the numeral *yi ‘one’ c-commands the numeral-classifier phrase *san wei laoshi ‘three teachers’ in the complex NP, and both wide and narrow scope readings of ‘three teachers’ are available.

(68) *wo mai-le [NP yi ben [san wei laoshi xie] de shu].*
I buy-ASP one Cl three Cl teacher write MOD book

(i). Wide Scope: [three teacher > one book]
‘There are three teachers x such that there is a book x wrote that I bought.’

(51)
(ii) Narrow Scope: [one book \(\nabla\) three teachers]

‘I bought a book that \textbf{three teachers} wrote.’

The above discussions have demonstrated that Mandarin bare numeral containing phrases also exhibit the long-distance scope ability in the same way as those in number marking languages. In the following section, we will see that numeral classifier phrases in Mandarin and numeral-noun phrases in number marking languages are similar with respect to their interpretation and distribution in the clausal domain.

### 2.3.3 Interpretation and distribution of Mandarin numeral classifier phrases

Numeral classifier phrases in Mandarin can appear in predicate positions just as those in number marking languages (c.f. (2), (17), (23) in Section 2.2.1). An example to illustrate this is given in (69).

\begin{align*}
(69) & \quad \text{Zhangsan he Wangwu shi liang ming xuesheng.} \\
& \quad \text{Zhangsan and Wangwu be two Cl student} \\
& \quad \text{‘Zhangsan and Wangwu are two students.’}
\end{align*}

Mandarin numeral classifier phrases can also appear in argument positions, as we just saw in Section 2.3.2. The distribution and interpretation of Mandarin numeral classifier phrases have been discussed in very early work such as Chao (1968: 76) and Li and Thompson (1981: 91, 167-168), which both share the observation that indefinite nominal expressions in Mandarin (including numeral classifier phrases) generally do not occur in sentence initial position. What I am going to show is that numeral classifier phrases in Mandarin can be allowed in sentence initial position under two circumstances, which are closely related to sentence types, i.e. (i) generic sentences, and (ii) episodic sentences.

As observed in A. Li (1997, 1998), numeral classifier phrases can freely appear in the sentence initial position if they receive a ‘quantity-denoting’ interpretation (see also Li and Thompson 1981: 167). The contrast is given below.

\begin{align*}
(70) & \quad \text{a. ??san ge xuesheng chi le dangao} \\
& \quad \text{three Cl student ate ASP cake} \\
& \quad \text{Intended reading: ‘Three students ate the cake.’} \\
& \quad \text{b. san ge xuesheng bu gou} \\
& \quad \text{three Cl student not enough} \\
& \quad \text{‘Three students are not enough.’} \quad \text{(A. Li 1997: 2)}
\end{align*}

The sentence in (70a) sounds unnatural to many speakers because they cannot understand who ‘three students’ is referring to. In order to make this sentence natural, a verb \textit{you} ‘exist/have’ can be added in the sentence initial position to assist the numeral classifier phrase to receive a \textit{non-specific} indefinite interpretation (71), namely, that it could be \textit{any} three students. In contrast, the numeral classifier phrase in (70b) above, according to Li, is not individual-denoting and receives a ‘quantity denoting’ reading instead, which merely expresses the quantity information denoted by ‘three’.
(71)  you san ge xuesheng chile dangao
exist three Cl student ate cake
‘There were three students eating the cake.’

Li’s contrast in (70) points to a very important semantic difference between these two types of numeral classifier phrases. The numeral classifier phrases in (70a/71) are object-referring, namely they refer to three boys in a particular situation/event. In contrast, the numeral classifier phrase in (70b) does not refer to any individual in a particular event/situation.

If the numeral classifier phrase in (70b) is 'number-denoting', one might expect it to behave differently from numeral-noun phrases in number marking languages. However, the reference of the numeral classifier phrase in (70b) accurately should be captured as generic rather than 'number-denoting': the sentence is a general statement about the number of boys that is not sufficient across situations/possible worlds. This indeed is the definition of generic sentences as in Krifka et al. (1995: 2-3), as discussed in Section 2.2.3.

Once the reference of numeral containing phrases in (70b) is captured as generic, we expect that numeral containing phrases in Mandarin should behave similarly to those in number marking languages in generic sentences. I will demonstrate this point below.

The generic sentence in (70b) is the same as its counterpart in number marking languages (c.f. (6), (16e), (22e), (48)). Some examples from English are repeated below.

(72)  a. Three boys are not enough.
    b. Three boys can lift a piano.
    c. Two magnets either attract or repel each other.
    d. Six apples cost one dollar.

Generic sentences in Mandarin are compatible with different tenses and/or aspect markers in the same way as those in English. Look at the following two generic sentences, both of which contain an aspect marker le or guo.

(73)  liang zhang chuang (wo tingshuo,) cengjing ji le wu ge ren.
two CL bed I hear-say used to squeeze ASP five Cl people
Na shizai shi tai ji le.
that really be too squishy SFP
‘Two beds(, I heard,) used to be crowded with five people. That was really too squishy.’
(A. Li 1998: 695, with slight modification)

(74)  Zhangsan cengjing dang guo zongtong.
Zhangsan ever serve ASP president.
‘Zhangsan used to serve as President.’
Similarly, in English, verbal predicates with different tenses (simple present tense, past/future tense) can have a generic interpretation besides the episodic interpretation (Krifka et al 1995: 9), as exemplified in (75).\footnote{There does exist a correlation between aspectual distinctions and generic sentences. According to Krifka et al (1995), there is a strong tendency that progressive and perfective sentences have an episodic, non-generic interpretation. However, some exceptions were also observed by Pelletier (1987) (see Krifka et al 1995: 9, fn 6 for detailed discussion).}

(75)  
\begin{enumerate}
  \item John smokes /smoked/ will smoke a pipe.
  \item John used to smoke a pipe. \hfill (Krifka et al 1995: 7-9)
\end{enumerate}

Besides the above similarity, numeral containing phrases in generic sentences in Mandarin also exhibit other similarities to those in number marking languages. I will further address two properties of generic sentences which capture previous observations of numeral classifier phrases in Mandarin.

A. Li (1998: 700-701) observes that numeral classifier phrases with generic reference (‘quantity-denoting’ in her term) cannot interact with other quantificational phrases. For instance, the following sentence in (76a) cannot receive an interpretation as ‘five children cannot finish, among them, 10 bowls of rice’ but the sentence in (76b) can receive such a reading with a sentence initial you ‘exist’.

(76)  
\begin{enumerate}
  \item \textit{wu ge xiaohai chi-bu-wan shi wan fan}.\hfill [*50 bowls]
    \begin{enumerate}
      \item five Cl child eat-not-finish ten bowl rice
      \item ‘Five children cannot finish ten bowls of rice.’
    \end{enumerate}
  \item you \textit{wu ge xiaohai chi-bu-wan shi wan fan}.\hfill [50 bowls]
    \begin{enumerate}
      \item have five Cl child eat-not-finish ten bowl rice
      \item ‘There are five children who cannot finish ten bowls of rice.’
    \end{enumerate}
\end{enumerate}

(A. Li 1998: 695, 701)

The contrast in (76), indeed, is the plurality problem of numeral containing phrases: distributive or collective. The Mandarin example in (76a) reflects one of the properties of generic sentences: sentence initial nominals with numerals cannot receive a distributive interpretation in generic sentences; they have to be interpreted collectively (Krifka et al 1995: 35-55). To illustrate this point, consider the following generic sentences with sentence initial numeral-noun phrases in English. When the predicate is a distributive predicate (77i), the sentence is awkward with the numeral-noun phrase \textit{twelve cats} in the sentence initial position (77ib), in contrast with (77ia). However, with nondistributive predicates (77ii), sentence initial numeral-noun phrases are acceptable.

(77)  
\begin{enumerate}
  \item Distributive predicates
    \begin{enumerate}
      \item Cats are beautiful when they have white fur.
      \item ?\textit{Twelve cats} are beautiful when they have white fur.
    \end{enumerate}
\end{enumerate}
ii. Collective predicates
   a. *Two canaries* can be kept in the same cage if it is large enough.
   b. *Two magnets* either attract or repel each other. (Krifka et al 1995: 35)

As for why (77ib) is not good, ‘it is mysterious why the speaker has chosen the predicate twelve cats in the restrictor when he could have the point with *ninety-nine cats* as easily, or simply with *a cat’* (Krifka et al 1995: 35). A possible explanation for why generic sentences must have *collective reading* rather than distributive reading with numeral subjects is provided by Declerk (1988), namely, distributive predicates require unboundedness. This unboundedness requires that the restrictive indefinites must *not* be numerically specified. In contrast, with nondistributive predicates, the number-specified numeral-noun phrases in the restrictor become acceptable as the number specification is essential (Declerk 1986, 1988, c.f. Krifka et al 1995: 35).

This is to say, if a predicate is neutral between distributive and non-distributive and if it used in generic sentences with a numeral subject, the numeral containing phrase receives a collective interpretation. An example to illustrate is given below. The sentence in (78) can only be interpreted as ‘six apples in total cost one dollar’ rather than ‘six apples, each of them costs one dollar’.

(78) *Six apples* cost one dollar. (Krifka et al 1995: 55)

Returning to the Mandarin examples in (76), the sentence in (76a) is a generic sentence, and the numeral classifier phrase can only receive a collective reading, namely, ‘five children all together, cannot finish ten bowls of rice over all events/situations’, as a result of ‘unboundeness’ requirement for indefinites, similar to the English case in (78). In contrast, in (76b), after adding an overt existential operator *you ‘exist’, the sentence is not a generic sentence anymore and becomes an episodic sentence. The unboundeness constraint is irrelevant in episodic sentences; therefore, the distributive predicate ‘eat’ allows the numeral classifier phrase ‘five children’ to be interpreted distributively: ‘there are five children, each of them cannot finish ten bowls of rice; thus there are fifty bowls in total’.

A. Li (1998) further observes another contrast involving numeral classifier phrases between sentences in (79) and sentences in (80).

   Three CL people lift-not-move this CL piano.

   *[tamen] de liliang tai xiao.*
   their DE strength too small
   ‘Three people cannot lift up this piano. Their strength is too weak.’

b. *Zhangsan zhidao [san ge ren] yiding ban-de-dong ziji de gangqin.*
   Zhangsan know three CL people certainly move-able-move self’s DE piano
   ‘Zhangsan knows that three people certainly can move self’s piano.’

(A. Li 1998: 699)
Numeral Classifier Phrases and Bare Nouns in Mandarin

(80)  a. you [san_ge_ren], hui lai. Tamen, hai hui dai livu lai.
     have three CL people will come they still will bring present come
     ‘There are three people coming and they will bring presents.’

     b. Zhangsan, zhidao Lisi, yiding ban-de-dong ziji de ganggin.
        Zhangsan know Lisi certainly move-able-move self’s DE piano
        ‘Zhangsan knows that Lisi certainly can move self’s piano.’

        (A. Li 1998:700)

In (79), the numeral classifier phrases cannot be referred anaphorically or referentially by a pronoun, whereas the numeral classifier phrase in (80a) can.

The contrast above indeed is a contrast between generic sentences and episodic sentences cross-linguistically and can be understood by the differences between them. The examples in (79) are generic sentences; the numeral classifier phrase san_ge_ren ‘three CL people’ in (79a) cannot be referred to anaphorically or referentially by a pronoun since it does not have a reference in a particular event/situation, nor does it refer to any individual. Regarding the logophor ziji in (79b), it also cannot be bound by a generic referring numeral classifier phrase which has to be interpreted collectively in generic sentence, as we saw previously. In contrast, the two sentences in (80) are episodic sentence, and the numeral classifier phrase ‘three CL people’ in (80a) does have a reference in a particular situation/event; therefore, the pronoun tamen ‘they’ can refer anaphorically/referentially to it.

In addition to Li’s (1997, 1998) work on generic numeral classifier phrases, Tsai (2001) examines in detail constructions in which you ‘exist’ need not occur and numeral classifier phrases can freely occur in sentence initial positions. All constructions observed by Tsai fall into the category of ‘generic sentences’ as described in Krifka et al. (1995). These constructions, as first observed in Tsai (2001) and modified by Liao (2011), are illustrated in (81).

(81)  Environments where a subject you-marker need not occur

     a. V-de/bu-V constructions
        san_ge_ren chi-de-wan wu wan fan
        three CI people eat-can-finish five bowl rice
        ‘(Generally speaking), three people can finish five bowls of rice’

     b. flip-flop constructions (the canonical order of object and subject is reversed)
        san_zhang_chuang shui shi ge ren
        three CI bed sleep ten CI people
        ‘Ten people share three beds (as a rule).’

     c. modal constructions
        san_ge_xuesheng keyi/yinggai jiao shi fen zuoye
        three CI student can/should hand-in ten CI assignment
        ‘Three students should hand in ten assignments (as an order)’
d. enough-constructions

\[
\text{san \ tai \ che \ gou \ zuo \ shi \ ge \ ren}
\]
three Cl car enough sit ten Cl people

‘Three cars are/is enough to carry ten people.’

e. conditional/counterfactual constructions

\[(\text{ruguo}) \text{san \ ge \ ren \ jiao \ shi \ fen \ zuoye, \ wu \ ge \ ren \ ne?}\]
If three Cl people hand-in ten Cl assignment five Cl people Q

‘If three people hand in ten assignments, how about five people?’

f. (generic) characterizing sentences\(^{23}\)

\[
\text{san \ zhi \ yazi \ you \ liu \ zhi \ chibang}
\]
three Cl duck have six Cl wing

‘Three ducks have six wings.’

(Tsai 2001: 146, summarized and modified by Liao 2011: 226)

All numeral classifier phrases in the above sentences do not refer to a plural individual in a particular event but a nonspecific plural individual across events, and it is the genericity of these sentences that gives rise to the generic interpretation of the numeral classifier phrases (c.f. Section 2.2.3).

Besides generic sentences, episodic sentences can also admit numeral classifier phrases in sentence initial positions in Mandarin.

As observed in Chao (1968: 76), it is possible for indefinite expressions to appear in the subject position, as shown in (82a), although the preferred (i.e. more frequently occurring) forms would be the one in (82b).

\[(82)\]

a. \[\text{yi \ ge \ mai \ shuazi \ de \ zai \ menkou-er \ ne.}\]
one Cl sell brush De at door SFP

'A brush peddler is at the door.'

b. \[\text{menkou-er \ you \ ge \ mai \ shuazi \ de.}\]
door have Cl sell brush De

'The doorway has a rush peddler.'

(Chao 1968: 76)

As further noted in A. Li (1998: 694, fn. 3), the reason why sentences with numeral classifier phrases in the sentence initial position like the one in (70a) (as repeated in (83i)) are usually marked as unaccepted or unnatural in the literature is perhaps because these examples are cited out of context, and because such sentences are not acceptable unless there is a clear linguistic quantity interpretation context. In other words, even in episodic sentences, indefinite numeral classifier phrases in Mandarin can appear in sentence initial position if the sentence is not uttered in an ‘out-of-the-blue’ situation but with contexts provided. I illustrate this point with the examples in (83ii). In both sentences in (83ii), a context is provided, and the numeral classifier phrases \text{san \ ge \ haizi} ‘three kids’ and \text{san}

\(^{23}\)Note that ‘generic sentences’ as describing (43f) has a much narrower meaning compared to the term in Krifka et al. 1995; their use of the term covers all the constructions in (43) including (43f) which reports the biological characteristics of a creature.
ge gongren ‘three workers’ are allowed in the sentence initial position and receive a specific reference.

(83) i. ?san ge xuesheng chi le dangao
three Cl student ate ASP cake
Intended reading: ‘Three students ate the cake.’

ii. Indefinite numeral classifier phrases in sentence initial positions with contexts
a. Context: there are three kids in the speaker’s family and the speaker refers to the three specific kids when uttering these sentences.

san ge haizi (dou) zai lou-shang zuo zuoye ne.
three Cl kid (all) at stair-up do homework SFP
‘Three (specific) kids are (all) doing homework upstairs.’

b. Context: the speaker hired three workers, the hearer knows about it, and the speaker refers to these three specific workers rather than any three workers when uttering the sentence.

san ge gongren zuotian yi-zhi gongzuo dao xianzai,
Three Cl work yesterday have-been work till now
wo yao haohao ganxie tamen.
I need good-good thank them
‘Three (specific) workers have been working from yesterday till now. I need to show my gratitude to them properly.’

If we place you ‘exist’ in the sentence initial position in (83ii), the numeral classifier phrases receive a nonspecific reference instead, as illustrated in (84).

(84) a. you san ge haizi (*dou) zai lou-shang zuo zuoye ne.
exist three Cl kid all at stair-up do homework SFP
‘There are three kids doing homework upstairs.’

b. you san ge gongren zuotian yi-zhi gongzuo dao xianzai,
e x ist Three Cl work yesterday have-been work till now
wo yao haohao ganxie tamen.
I need good-good thank them
‘There were workers that have been working from yesterday till now. I need to show my gratitude to them properly.’

In object positions, indefinite numeral classifier phrases are freely allowed (e.g. Chao 1968; Li and Thompson 1981; Cheng and Sybesma 1999, 2005, among many others):

(85) a. jin lai le yi ge ren.
enter come PFV one Cl person
'A person came in.'

b. wo xiang mai yi ben shu.
I want buy one Cl book
'I would like to buy a book.'
In addition to receiving generic and indefinite readings in argument positions, numeral containing phrases in Mandarin can also be used with definite elements to appear in argument positions in the same way as those in number marking languages (c.f. (3), (18), (24)). Mandarin does not have overt definite determiners (the same as number languages like Russian), but it has demonstratives which can appear with numeral classifier phrases to yield a definite interpretation (86a); numeral classifier phrases in Mandarin can further be used with quantifiers such as mei ‘every’ in argument positions, as illustrated in (86b).

(86) a. Zhangsan guyong le na/zhe liang ge nanhai.
   Zhangsan hire ASP that/this two Cl boy
   ‘Zhang hired those/these two boys’

b. mei san ge xuesheng jiao yi fen baogao
   every three Cl students hand-in one Cl report
   ‘Every group of three students hands in a report.’

Numeral classifier phrases in Mandarin lack the anaphoric use, just like numeral-noun phrases in number marking languages (c.f. (7). (19, (25)). In (87a), ba ge nansheng ‘eight boys’ cannot receive a definite reading and cannot anaphorically refer to the plural individual in the antecedent clause. After a demonstrative is added, the [Dem Num Cl NP] phrase receives a definite interpretation and can be used anaphorically (87b).

(87) a. jizhe-hui shang lai le shi ge jizhe he ba ge xusheng.
   press conference top come ASP ten Cl reporter and eight Cl student
   #ba ge xuesheng wen le henduo wenti
   eight Cl student ask ASP man question
   Intended: ‘Ten reporters and eight students came to the press conference; the eight students asked many questions.’

b. Jizhe-hui shang lai le shi ge jizhe he ba ge xusheng.
   press conference top come ASP ten Cl reporter and eight Cl student
   na ba ge xuesheng wen le henduo wenti
   that eight Cl student ask ASP many question
   ‘Ten reporters and eight students came to the press conference; those eight students asked many questions.’

Last, the same as numeral-noun phrases in number marking languages (c.f. (8), (20), (26), numeral classifier phrases in Mandarin also have entity level use:

(88) Yuehan zhong san gongjin.
   John weight three kilo
   ‘John weighs three kilos.’

The above discussion has demonstrated that Mandarin numeral classifier phrases behave quite similar to numeral-noun phrases in number marking languages with respect to distribution and interpretation. Mandarin numeral classifier phrases can appear in both predicate positions and argument positions. In argument positions, they behave like
numeral indefinites in number marking languages and can receive long-distance scope interpretations and escape island constraints. Mandarin numeral classifier phrases can also receive a generic interpretation and freely appear in argument positions; they can be used with a quantificational expression like ‘every’ to serve as generalized quantifiers or be used with a demonstrative to receive a definite interpretation.

There is, however, a distributional difference between numeral classifier phrases in Mandarin and numeral-noun phrases in number marking languages, namely, without contexts provided, it is unnatural for Mandarin indefinite numeral classifier phrases to appear in the sentence initial positions (c.f. (83i)).

In (89), I summarize argumental numeral classifier phrases in Mandarin with respect to their interpretation and distribution. In (90) through (94), I summarize the examples demonstrating all the properties of numeral classifier phrases in Mandarin that have been discussed.

(89) Summary of argumental numeral classifier phrases in Mandarin

<table>
<thead>
<tr>
<th>[Num Cl N]</th>
<th>References</th>
<th>sentence initial positions</th>
<th>postverbal positions</th>
</tr>
</thead>
<tbody>
<tr>
<td>indefinite</td>
<td>nonspecific</td>
<td>??</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>Specific</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>generic</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>*definite</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

(90) Mandarin Numeral Classifier Phrases: predicative

Zhangsan he Wangwu shi liang ming xuesheng.
Zhangsan and Wangwu be two Cl student
‘Zhangsan and Wangwu are two students.’

(91) Mandarin Numeral Classifier Phrases: argumental

a. jiao-shi li you liang ge nüsheng
   classroom inside have two Cl girl
   ‘There are two girls in the classroom.’

b. wo kanjian le wu zhi gou
   I see ASP five Cl dog
   ‘I saw five dogs.’

c. ruguo ni neng dai liang ge xuesheng lai wo-de party de-hua,
   if you can bring two Cl student come my party if
   wo hui hen kaixin.
   I will very happy
   ‘If you can bring two students to my party, I will be very happy.’
(i) Wide scope: two > if [island-escaping: wide scope]
(ii) Narrow scope: if > two
d. *dabufen laoshi dou anwei le [mei yi ge mei yi ge mei yi ge mei yi ge mei yi ge mei yi ge mei yi ge mei yi ge][bei yi ge pinazi pian le qian] de xuesheng]*
   Lit: ‘Most teachers consoled every student who was conned out of money by a swindler’
   (i) Intermediate scope: [most teacher > one swindler > every student]
   ‘For most teachers, there is a specific swindler that they consoled every student who was conned out of money by this swindler.’
   (ii) Narrow scope: [most teacher > every student > one swindler]
   ‘For most teachers, they consoled every student who was conned out of money by *any* swindler.’

e. *san ge nansheng neng tai-qi yi jia gangqin.*  
   ‘Three boys can lift a piano.’

(92) Mandarin Numeral Classifier Phrases: restrictors of demonstratives/quantifiers
a. *Zhangsan guyong le [na/zhe liang ge nanhai].*  
   ‘Zhang hired those/these two boys’

b. *mei san ge xuesheng jiao yi fen baogao.*  
   ‘Every group of three students hands in a report.’

(93) Mandarin Numeral Classifier Phrases: no anaphoric use

(94) Mandarin Numeral Classifier Phrases: entity use

(95) Indefinite numeral classifier phrases in sentence initial positions with contexts
   a. Context: there are three kids in the speaker’s family and the speaker refers to the three specific kids when uttering these sentences.

   ‘Three (specific) kids are doing homework upstairs.’
b. Without contexts, numeral indefinites are unnatural in sentence initial position

\[ \text{san ge xuesheng chi le dangao} \]
\[ \text{three Cl student eat ASP cake} \]
Intended reading: ‘There are three students ate the cake.’

With a fuller picture of the interpretation and the distribution of Mandarin numeral classifier phrases and a better idea of their internal properties, I would like to understand a main puzzle: how can numeral classifier phrases in Mandarin be so similar to numeral-noun phrases in number marking languages in the clausal domain with respect to their syntax and semantics (c.f. Section 2.3.2 and Section 2.3.3) but so different from them in the nominal internal domain (c.f. Section 2.3.1)? Specifically, I would like to account for the following properties of numeral classifier phrases in Mandarin:

(96) Issues to understand about Mandarin numeral classifier phrases in comparison to numeral-noun phrases in number marking languages
(i) their similarities in the clausal domain (‘outer similarities’)
   a. long-distance scope and island-escaping ability
   b. their similar distribution and interpretation
(ii) their differences in the nominal internal domain (‘inner differences’)
   a. numerals cannot directly combine with a bare noun in Mandarin;
   b. classifiers always obligatory when a numeral combines with a noun in Mandarin;
   c. bare noun always directly merge with a verb and freely be argumental in Mandarin;
   d. numeral-less [Cl N] phrases are only acceptable in rather restricted positions in Mandarin (i.e. only possible in certain postverbal positions).

In the next subsection, I review previous analyses of Mandarin numeral classifier phrases to examine what issues have been solved and what issues remain unexplained.

2.3.4 Previous analyses of Mandarin numeral classifier phrases

The previous research on Mandarin numeral classifier phrases mainly focuses on explaining their distributional and interpretational differences, and those differences receive mainly structural accounts. I will review three representative analyses by A. Li (1997, 1998, 1999), Tsai (1999, 2001) and Liao (2011).

2.3.4.1 A. Li (1997, 1998, 1999): DP and NumP Analysis

As we have seen, A. Li (1997, et seq) observes that Mandarin numeral classifier phrases can appear in sentence initial positions when they receive a generic interpretation (the so-called ’number-denoting’ use, in her terms), in contrast with indefinite numeral classifier phrases. Li proposes that the semantic interpretational differences correlate to two different syntactic structures which lead to their distributional differences.
According to Li, numeral classifier phrases with indefinite readings (‘object-referring indefinite’ or ‘individual-denoting’ in her terms), which require you in the sentence initial position, project a DP with an empty D. Li assumes that the empty D contributes to the existential reading of numeral classifier phrases and is subject to the ECP, following Longobardi’s (1994) government-based DP Hypothesis. This treatment ties the indefinite reading of numeral classifier phrases to a fixed syntactic position—D (97a).

(97) Argumental numeral classifier phrases in Mandarin (A. Li 1998)

(a. object-referring: DP

(b. Quantity-denoting: NumP

Regarding numeral classifier phrases with the generic interpretation (‘number denoting’ in her term), Li assumes that an intermediate projection exists between DP and NP—a NumP (97b). She compares nominal structure with clausal structure by equating DP with CP (both functioning as arguments) and NP with VP (both functioning as predicates) and proposes that an intermediate structure between DP and NP, i.e. NumP, can occur without a dominating DP, and this NumP is equivalent to IP at the clausal level (IP can occur without a dominating CP, as in exceptional-Case-marking or raising structures). Li argues that NumPs on their own can also be argumental in Mandarin in addition to argumental DPs. Given that there is no empty D, the generic NumP is not subject to any syntactic constraint and can freely be argumental in any position. Li further provides three empirical arguments to support the differences between the indefinite DP and the generic NumP with respect to co-occurrence with operators like you ‘exist’ and dou ‘all’, coreference and binding possibilities, and scope properties.

In addition to the observational contribution of numeral classifier phrases, as we saw in Section 2.3.3, Li’s work is important at least in two respects. The first is that her observation and analysis provide an empirical argument for the claim that the functional projection DP could exist in a language without overt determiners, such as Mandarin.

Note that numerals are in the Spec position of NumP Li’s (1998, 1999) work but in its head position in her (1997) work.
which strengthens the DP hypothesis. The other is that she proposes that NumPs can be argumental on their own without a DP projection. I adopt her insight concerning argumental NumPs for Mandarin numeral classifier phrases. However, we shall see that the government-based DP analysis does not suit Mandarin numeral classifier phrases. Below I consider three arguments against applying Longobardi’s DP hypothesis to Mandarin numeral indefinites (see also Yang 2001).

First, linking the indefinite readings of numeral classifier phrases to a syntactic position D which is subject to a licensing condition (i.e. government) is incapable explaining their interpretations and distributions in Mandarin.

Longobardi’s (1994) government-based DP hypothesis is designed to explain why Italian bare plurals and mass nouns, which can only receive a narrow scope existential (not a generic interpretation) and are only allowed in object positions not in subject positions:

(98) a. *Acqua viene giu dalle colline
     water comes down from-the hills
     (Italian)

     b. Ho preso acqua, dalla sorgente.
        I took water from the spring
        ‘I took water from the spring.’
        (Longobardi 1994: 616)

(99) a. Ho trovato buon vino e arance fresche
     I found good wine and fresh oranges
     ‘I found good wine and fresh oranges’

     b. *Ho amo buon vino e arance fresche
        I love good wine and fresh oranges
        Intended: ‘I love good wine and fresh oranges.’
        (Longobardi 1994: 631)

The empty D, under Longobardi’s approach, contributes to the existential interpretation of Italian bare plurals and mass nouns and is subject to syntactic licensing. However, as we have seen above, numeral indefinites in Mandarin receive both specific and nonspecific interpretations, in addition to a generic interpretation. Further, generic and specific indefinite numeral classifier phrases both can appear in the sentence initial position (e.g. (70b) and (83ii)), and only nonspecific numeral classifier phrases are usually not preferred in this position (c.f. (82)/(83i)). Without making changes to the

25 Regarding the syntactic distribution and interpretations of bare plurals and mass nouns (i.e. existential and generic) in English, Longobardi (1994 sub seq) assumes that those bare plurals/mass nouns project a null D with an existential operator as well. But unlike Italian, the null D in English is assumed not to be subject to licensing constraint in the syntax; therefore, English bare plurals can appear freely in any argument position. The generic reading and the existential reading of bare plurals/mass nouns in English are further explained by Diesing’s (1992) Mapping Hypothesis: the generic reading will emerge if bare plurals map into the restrictor in generic sentences; when bare plurals map into the nuclear scope in episodic sentences, it will lead to an existential reading. I refer the readers to Dayal (2011b) for a detailed review of Longobardi (1994 sub seq).
original DP hypothesis, the approach based on the empty D is unlikely to account for the interpretation and distribution of Mandarin numeral classifier phrases.26

Second, it is impossible to account for the long-distance scope interpretation and the island-escaping ability of indefinite numeral classifier phrases in Mandarin by assuming an empty D as in Longobardi 1994 or even in his later work. We elaborate this below.

Another important component of Longobardi’s DP hypothesis is that the empty D receives the narrowest possible scope (i.e. default existential) interpretation (Longobardi 1994: 618/641). This component finds its basis in the empirical facts concerning bare plurals/mass nouns in both Italian and English: they behave the same with respect to their interpretations and scope behavior. As Longobardi notes, Italian bare plurals/mass nouns receive only opaque interpretations and exhibit the narrowest scope behavior, just like English bare plurals/mass noun (Carlson 1977b). This empty D for bare plurals/mass nouns also differs from other overt indefinite Ds in that the latter can receive both opaque and transparent interpretations with long-distance scope, as we saw in (45) (repeated in (100)).

\[(100)\]
\[
\begin{align*}
\text{a. Miles wants to meet policemen.} & \quad \text{want > 3/*3 > want} \\
\text{b. Miles wants to meet a policeman.} & \quad \text{want > 3/3 > want} \quad \text{(Carlson 1977b: 16)}
\end{align*}
\]

Mandarin does not have overt indefinite Ds as Italian/English does, which were assumed to contribute to the long-distance scope interpretation of indefinites by Longobardi. Assuming an empty D projecting above numeral classifier phrases in Mandarin, one would expect numeral-classifier phrases in Mandarin to behave like bare plurals and mass nouns in Italian/English, which only receive a narrowest scope (existential) interpretation because the empty D only contributes to the narrow scope existential interpretation in Longobardi’s framework.27 However, this is not the case: Mandarin indefinite numeral classifier phrases behave like some/a and numeral indefinites in English regarding long-distance scope (c.f. Section 2.3.2).

2.3.4.2 Tsai (1999, 2001): Extended Mapping Hypothesis

Tsai (1999, 2001) examines the environments where numeral classifier phrases can appear in the sentence initial position without the verb you ‘exist’. He observes an interaction between modality and generic interpretations (his ‘quantity-denoting’ reading) of the numeral classifier phrases in all of these environments. Tsai’s observation indeed

\[\]

26 A possible change to the original assumptions of the DP hypothesis can be that the empty D contributes to nonspecific indefinite interpretations only but not specific indefinite or generic interpretations in Mandarin; then, the subject-object asymmetry can be explained via some syntactic licensing constraints (e.g. ECP). Nevertheless, by doing so, some other puzzles emerge. To name a few: why do only numeral indefinites with non-specific interpretations project D? What contributes to the specific and generic interpretations?

27 Note that, Longobardi (1994 et seq) does not discuss numeral noun phrases, so it remains unknown whether or not a DP will project above numeral noun phrases in Italian/English within his framework.
captures the fact that the interpretation of numeral classifier phrases in generic sentences is contributed by something in the clausal level rather than in the Num-ClP itself.

Based on the observation of the correlation between modality and sentence initial numeral classifier phrases, Tsai proposes an extended mapping hypothesis based on Diesing’s (1992) Mapping Hypothesis. In Tsai’s hypothesis, it is a VP-level existential operator that is responsible for the interpretation of the numeral classifier phrases (both indefinite and generic). In addition, whether verbs can undergo head movement to the head of IP or to that of ModP to bind the subject numeral classifier phrases is crucial in his account. In the case of generic sentences, according to Tsai, verbs can undergo V-to-Mod movement so that the existential operator associated with the verb can bind the numeral classifier phrase in the subject position. In contrast, in episodic sentences, verbs cannot undergo V-to-I movement in Mandarin, which, he assumes, is due to the lack of any agreement morphology in Mandarin. As a consequence, the existential operator on V cannot license the numeral classifier phrase in the subject position in episodic sentences, and the vacuous quantification is rescued by an overt existential operator you.

Tsai’s analysis provides a straightforward account for the reason why the verb you is required for sentence initial numeral classifier phrases in episodic sentences. However, it still faces three challenges. First, it is unclear how Tsai’s analysis explains the long-distance scope property of indefinite numeral classifier phrases (c.f. Section 2.3.2) given that the existential closure operator is assumed to be local within the VP domain. Second, as we have seen, in episodic sentences, numeral classifier phrases can also appear in subject position when contexts are provided (c.f. (83)). Third, as for generic sentences, the reference of the numeral classifier phrases is not existential but generic, and numeral classifier phrases do not have existential interpretations in any situation/possible world, as we have discussed in Section 2.3.3 (see also E. Tsai (2011) for a review of Tsai (2001)).

2.3.4.3 Liao (2011): Parallel Merge and DP analysis

Liao (2011) proposes a parallel merge analysis with a modified version of Zamparelli’s (2000) two-layer DP hypothesis for Mandarin numeral classifier phrases. In brief, Liao separates both the indefinite and the generic force from numeral classifier phrases and attributes them to the inherent features [+existential] in Asp and [+Gen] in Mod, respectively. He assumes that D always projects above numeral classifier phrases in Mandarin and undergoes Parallel Merge with the head of AspP or that of ModP in narrow syntax. Furthermore, Liao follows Mergerdoomian (2008) and Tenny (2000) in assuming that AspP in Mandarin is located lower than vP but higher than VP. According to him, the head of AspP is associated with the existential closure operator with the [existential] feature if the Asp head is overt. As for ModP, which is located above vP, its head is associated with the Generic operator, along with the [Gen] feature in syntax. Liao explains the generic reading (‘quantity denoting’ in his work) and the existential reading of numeral classifier phrases through Multiple Agreement (both downward and upward Agree) (as in Pesetsky and Torrego 2007) and operator-variable unselective binding (as in Aoun and Li 2001), with a series of other assumptions. Below we consider some of his other assumptions about the syntax and semantics of these constructions.
First, Liao assumes that an empty D head always projects with NumP in Mandarin and that numerals are the head of NumP in the syntax but a modifier of N in the semantics. He identifies his NumP to the PredDP in Zamparelli’s (2000) work and his DP to Zamparelli’s SDP (Liao 2011: 242).  

Second, Liao further identifies his version of SDP with the DP in Li’s work and his PredDP to Li’s NumPs, namely DP receives an individual denoting reading whereas NumPs receive a quantity-denoting one.  

Third, in the semantics, Liao adopts Lin’s (2004) analysis of the existential and generic operators in Mandarin, together with some further assumptions. Lin (2004) argues that the null Asp in Mandarin brings about a habitual/generic modal meaning, while dynamic aspects are associated with existential closure. Liao adopts Lin’s view and further assumes that the generic operator resides in the lower modal and that this ModP necessarily appears with a null Asp which does not have quantificational force (Liao 2011: 244). Liao assumes that the existential operator is realized on the overt AspP head and that the Generic operator is realized on the ModP head; these two operators bind their indefinite variables respectively through unselective binding, as illustrated below.

\[
\begin{align*}
\text{(101)} & \quad a. \text{Asp}\left[\exists\right] & \ldots \text{variable}_i \\
& \quad b. \text{Modal[Gen]} & \ldots \text{Asp}[\emptyset] & \ldots \text{variable}_i
\end{align*}
\]

(Liao 2011: 312)

Syntactically, existential and generic force are realized as syntactic inherent features in Asp and Mod respectively. These features are valued through Spec-head Agreement through feature specifications to D that have undergone parallel merge. Specifically, the null D carries an unvalued (but interpretable) quantificational feature, as i[QF], looking for the closest possible valued feature (either upwardly or downwardly), and Agrees through the Spec-head relation either with the head of AspP or ModP.

With these assumptions, Liao explains the number denoting reading (i.e. the generic reading of numeral classifier phrases) and the existential force of the DP in

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28 In Zamparelli’s 2000 work, numerals are always heads in DP (p. 251), either in a higher DP position (his StrongDP (SDP)) or a lower DP position (his Predicate DP (PDP)). Numerals can be heads of PD or SD. When in PD, they must be interpreted as weak cardinality predicates and cannot be interpreted referentially or specifically (p. 239). In contrast, numerals, which are stronger quantifiers or referential elements, are in the SD position. Thus, for argumental numeral expressions, numerals are determiners in Zamparelli’s work, as generalized quantifiers, of type \(<<e,t>,<e,t>,t>>\) (see Ionin and Matushansky 2006 for clarification and discussion of problems associated with this treatment of numerals). Furthermore, Zamparelli proposes the following principles: 1. Only SDPs can appear in Argument position (p.121, ex (322)); 2. All and only non-referential SDPs undergo QR at LF (p. 119, ex (319)); 3. A filled SDmax layer triggers presuppositions of existence (p. 121: ex (321). Zamparelli explains the different scope interpretations of numeral phrases together with some semantic assumptions.

However, in Liao’s work, determiners and numerals are two separate, independent lexical items in argumental numeral expressions. Accordingly, Liao’s identification of his version of DP/NumP with Zamparelli’s SDP and PredDP are inappropriate. Even for the non-argumental numeral expressions, numerals in their work differ semantically in nature: in Zamparelli’s work they are predicates while in Liao’s they are modifiers of N.

29 If D is a head merging with another head (Mod or Asp), we are left with the question of why the agreement between these two heads is established through Spec-head agreement. We should not be able to get a concept of ‘specifier’ here as the merger occurs between two LIs rather than two SOs.
subject and object positions as follows. The quantificational force of quantity denoting numeral classifier phrases is valued by the feature [Gen] (a universal quantification) in Mod, which necessarily appears with a null Asp. As for the number denoting DP in object position, as the null Asp is assumed not to have quantificational force it enables the unvalued feature on D in the object position to continue looking upward until it encounters a valued feature to check with; this is the [Gen] feature on Mod. For the quantity denoting DP in subject position, its D directly merges with Mod and checks its Q feature with [Gen] on Mod. In order to enable the quantity denoting reading of both subjects and objects, Liao assumes Multiple-Agree in syntax and unselective binding in semantics (Liao 2011: Section 5.3.2). With regard to the existential reading of DPs in subject and object positions, Liao (2011: 253) suggests that sentence initial you and the subject DP are introduced in independent domains and that D is valued by the quantificational feature associated with you. For object DPs with existential interpretations, the uninterpretable [QF] feature in D is valued by Asp.

Liao’s analysis correctly capture the source that contributes to the generic interpretation (his ‘number-denoting’ reading) of numeral classifier phrases in generic sentences: the genericity in the sentence. Liao (2011: 50) adopts Kratzer’s 1981 work on the Gen operator, which, under his approach, is realized in Mod, quantifying over the sentence and contributing a universal quantification over possible worlds. However, Liao’s analysis faces two main empirical problems.

First, although it is correct to attribute the generic reference of numeral classifier phrases to a Gen operator in generic sentences that is introduced in a fixed high enough syntactic position (i.e. Mod) to quantify over both subjects and objects; however, it is incorrect to tie numeral classifier phrases’ indefinite interpretations tightly and solely to a fixed low syntactic position below vP (i.e. in AspP). To be concrete, this very local existential operator on the head of AspP which is assumed to be lower than vP in Liao's work cannot provide the correct interpretation for numeral classifier phrases in the preverbal position in episodic sentences (c.f. (83)). Second, this local existential operator lower than vP also cannot allow for the long-distance scope interpretation of numeral classifier phrases outside of vP.  

In addition to the above two empirical problems, there are two theoretical puzzles in Liao’s analysis. First, one may wonder how we should justify the language-specific assumptions about Mandarin made in Liao’s work (e.g. AspP locates lower than vP, the null Asp head does not have quantificational force but an overt Asp does, etc.). More importantly, these language-specific assumptions about Mandarin make it difficult to understand the rather similar behavior of its numeral containing phrases and those in

---

30 In addition to the puzzles surrounding the indefinite numeral classifier phrase, Liao's analysis of generic numeral classifier phrases is also challenged empirically. According to Liao, the generic operator necessarily requires a null Aspect to co-occur with it in Mandarin. If the head of AspP is overt in a generic sentence, it will Agree and check the [existential] feature with D in the object position, and this will block the object D from 'looking up' to Agree and check with the [Gen] feature on Mod. Nevertheless, we do observe examples of generic sentences with overt aspect markers, which demonstrate that generic sentences do not exclude overt aspect in Mandarin (c.f. (73)/(74) in Section 2.3.3).

31 Liao follows the assumption by Mergerdoomian (2008: 90) and Tenny (2000: 326) that AspP is lower than vP; however, this assumption was proposed without justification in these work as well.
other languages. Either we need to apply what Liao has assumed to other languages as well, or we need to make further language-specific assumptions for other languages.

The second puzzle is a broad one, namely, how we understand the assumptions and stipulations in the narrow syntax in Liao’s work. As Liao is pursuing a Minimalist approach for syntax, the purpose of which is a ‘slimmer and slimmer’ UG by reducing most if not all principles/conditions/constraints to a third factor explanation (Chomsky (2005, sub seq)), we need to know where we can attribute these assumptions and stipulations to: UG, the third factor, or somewhere else?

To summarize this section, previous analyses provide us with important observations and insights into the properties of numeral classifier phrases in Mandarin and help us address some of issues we would like to understand in (96). Nevertheless, as we have seen, lots of puzzles still remain unsolved.

In the next section, I will provide an alternative analysis of numeral classifier phrases in Mandarin, which, as we will see, can derive in a straightforward way the similarities between numeral-containing phrases in Mandarin and those in number marking languages in the clausal domain as well as their differences in the nominal internal domain. Crucially, the analysis correctly predicts the scope behavior of bare nouns in Mandarin, as I will demonstrate in Section 2.5; it also has further implications for the numeral-less classifier phrase [Cl N] in Mandarin (to be shown in Section 2.6).

2.4 A D-less analysis of Mandarin numeral classifier phrases

In this section, I will start with the syntax of numeral classifier phrases in Mandarin with the goal to understand the uniform properties that numeral classifier phrases and number-noun phrases share crosslinguistically (i.e. issues in (96i)). Then I will move on to the semantics of bare nouns and that of classifiers in order to understand the differences between Mandarin and number marking languages in the internal nominal domain (i.e. issues in (96ii)).

2.4.1 Uniform D-less analysis of bare numeral-(classifier)-noun phrases

Section 2.2 and Section 2.3 showed to us that the behavior of bare numeral-noun phrases in number marking languages and that of numeral classifier phrases in Mandarin exhibit tremendous uniformity with respect their scope behavior, distribution and interpretation, so one may wonder whether the D-less analysis of numeral-noun phrases argued in Section 2.2.3 (c.f. (41) and (46)) can be extended to numeral classifier phrases in Mandarin. Indeed, it is desirable to analyze bare numeral containing phrases across languages in a similar way since such an analysis not only accounts for their cross-linguistically uniform behaviors, but it also avoids language specific assumptions about bare numeral containing phrases. Under such an approach, let us first settle on the syntax of numeral classifier phrases.

32 The goal is to enable us to understand the evolutionary puzzle of human languages (see Chomsky (2005 et seq) for details).
Regarding the internal domain of numeral classifier phrases, many authors establish a connection between the number morphology and the classifier (Greenberg 1972; Sanches and Slobin 1973; T’sou 1976; Doetjes 1997, 2012; Chierchia 1998b; Cheng and Sybesma 1999; Fukui and Takano 2000; Borer 2005, Watanabe 2006, among others). They either observe that the use of number morphology and that of classifiers are in complementary distribution (Sanches and Slobin 1973: 4; T’sou 1976: 1216), or they argue that their roles are parallel, i.e. classifiers and the number morphology both signal the presence of minimal parts and that ‘numerals need the presence of a syntactic marker of countability which can be either individual classifiers or number morphology’ (Doetjes 1997: 35). Based on either their complementary distribution or their parallel role, a number of authors identify classifiers with number morphology and propose that they should appear in same position in the structure (Doetjes 1997; Chierchia 1998b; Cheng and Sybesma 1999; Fukui and Takano 2000; Borer 2005, Watanabe 2006, among others). Although the details of their analyses of the internal structure of numeral classifier phrases may differ, these authors seem to agree on a structure roughly like the one in (102) (I refer the readers to Dékány 2011: 232-233 for a review of their work).

(102)

```
DivP (ClP)
   \  /  \
  n  Div' (Cl')
 /  \  /     \  /
Div (Cl) NP -s
```

In (102), the number morphology and the classifier appear in the same position, i.e. the head of the Division Phrase Div (or the head of the Classifier Phrase Cl); the Div head merges with an NP, forming a larger phrase (i.e. Div' or Cl') and further merging with a numeral $n$.  \(^{33}\)

I will adopt the structure in (102) to maintain the connection between the number morphology and the classifier. Regarding numerals, as argued in Section 2.2.2 and Section 2.2.3, they are phrasal in the syntax and property-seeking functions in the semantics across languages. The structure in (102), together with the proposed analysis of numerals in (46) (as repeated in (103b)) helps us arrive at an uniform D-less structure of bare numeral-(classifier)-noun phrases across languages (103a). \(^{34}\)

---

\(^{33}\) Counterexamples in which classifiers and number morphology co-occur have been observed (e.g. Sanches and Slobin 1973; Aikhenvald 2000; Zaavala 2000; Wiltshko 2008; De Belder 2008; Gebhardt 2009). I will address this issue in Chapter 3, Section 3.5.

\(^{34}\) The locality of this Spec-Head relation between a numeral and a classifier in (103a) is also seen in Cheng and Sybesma (1998: 406), Watanabe (2006; 2010), and Zhang (2013: 213).
Numeral Classifier Phrases and Bare Nouns in Mandarin

(103) a. the structure of argumental/predicative numeral-(classifier-) noun phrases

\[
\begin{align*}
\text{DivP (ClP)} & \\
\text{NumP} & \quad \text{Div' (Cl')} \\
\text{n}(f_5) & \quad \text{Div}^0 (Cl) \quad \text{NP}
\end{align*}
\]

b. Lexical view of ambiguous bare numerals
   i. Numeral \(<<e, t>, <e, t>>\) = \(\lambda P\forall x [n (x) \land P(x)]\)
   ii. Numeral \(<<e, t>, e>\) = \(\lambda P\exists (\lambda x [n (x) \land P(x)])\)

\[
\text{If } [[\alpha]] \in \text{Num} <<e,t>, <e,t>> , \text{ then } \lambda P \exists (\lambda x [n (x) \land P(x)]) \in \text{Num} <<e,t>, e>
\]

\(f_3\) is subject to existential closure at arbitrarily chosen scope sites.

In the rest of this work, I will use ClP instead of DivP in the discussion. Since the classifier-noun phrase Cl' is able to combine directly with numerals, it follows naturally that Cl' [Cl N] should denote properties. Then what remains unknown is the semantics of classifiers and that of bare nouns in ClPs, which I will discuss shortly in Section 2.4.2. Although we have not fully understood the internal domain of numeral classifier phrases in Mandarin yet, this analysis in (103) is sufficient to account for the uniform behavior of numeral-(classifier)-noun phrases in Mandarin and number marking languages at the clausal level without additional language specific assumptions. I will demonstrate this below.

Let us first consider the predicative use of Mandarin numeral classifier phrases in (69), as repeated in (104); its analysis is given in (105) (with the unknown parts in the semantics of classifiers and bare nouns underlined).

(104) Property 1: predicative use

\[
\text{Zhangsan, Lisi, Wangwu shi san ge xuesheng.}
\]

\[
\text{Zhangsan, Lisi, Wangwu be three Cl student}
\]

\[
\text{‘Zhangsan, Lisi and Wangwu are three students.’}
\]

(105) a. 

\[
\begin{align*}
\text{ClP} & \\
\text{NumP} & \quad \text{Cl'} \\
\text{san} & \quad \text{NP} \\
\text{ge} & \quad \text{xuesheng}
\end{align*}
\]

b. \(san = \lambda P[3 (x) \land P(x)]\) \(<<e, t>, <e, t>>\)

c. \([ [san \text{ ge xuesheng}] ] = \lambda x [3 (x) \land \text{ge(xuesheng)} (x)]\) \(<e, t>\)

The predicative status of the numeral classifier phrase in (105) allows it to serve as the restrictor of demonstratives, as shown in (106) and (107).
(106) Property 2: restrictor of demonstratives
_Zhangsan guyong le na/zhe liang ge nanhai._
Zhangsan hire ASP that/this two Cl boy
'Zhang hired those/these two boys'

(107) a. 
```
  Dem  CIP     CIP    NP
     zhe  |      |      |
     'this' | liang | Cl     | nanhai
     'two'
```
b. $[[\text{zhe}]] = \lambda P x [P(x) \land x \text{ is in this}_n]$, in which 'this' denotes a non-distal situation that the speaker is pointing at. $<e, t>, e$
c. $[[\text{liang ge nanhai}]] = \lambda x [2(x) \land \text{ge(nanhai)}(x)]$ $<e, t>$
d. $[[\text{zhe liang ge nanhai}]] = \lambda x [2(x) \land \text{ge(nanhai)}(x) \land x \text{ is in this}_n] <e>$

In (107), there are two points that I will address. First, I follow Kaplan (1989), Wolter (2006) and Dayal (2012) in assuming that demonstratives are property-seeking functions with an indexical specification. Second, I treat demonstratives syntactically differently from article determiners: the former appears the specifier positions (of ClPs), whereas the latter is the head of DPs. Below I provide my motivation for treating demonstratives differently from article determiners.

In the syntax, demonstratives and determiners have traditionally been assigned to the same structural position (e.g. Jackendoff 1977). This analysis aimed to capture the fact that in languages like English article determiners and demonstratives cannot co-occur (i.e. they have the same distribution), as illustrated in (108).

(108) a. This book is interesting.
   b. That book is boring.
   c. *This the book is interesting.
   d. *The this book is interesting.
   e. *That the book is boring.

Despite the fact above, many authors have argued that demonstratives and determiners do not occupy the same structural position (Giusti 1997, 2002; Brugé 2000, 2002; Brugé & Giusti 1996; Panagiotidis 2000; Grohmann and Panagiotidis 2004; Shlonsky 2004; Alexiadou et al 2007, among others). One of their arguments for distinguishing the structural position of demonstratives from determiners is that in many languages, such as Romanian, Hungarian, Spanish, Greek, the two elements can co-occur, as exemplified in (109).
These authors further argue that demonstratives are base-generated in a lower position between NP and DP and can undergo movement to a higher specifier position, e.g. Spec DP (e.g. Giusti 2002: 71-72; Alexiadou et al 2007: 109).

Take Romanian as an example, its demonstrative can appear in the position preceding the bare noun (110a); when the enclitic article determiner is merged (110b), the demonstrative cannot appear in the position preceding the noun (110c) but only in the position following the noun (110d). Giusti (2002) argues that the position of the demonstrative in (110d) is an intermediate position lower than DP. She proposes the structure in (111) to derive the Romanian examples.

(110) a. acest baiat (frumos al său)
    this boy nice of his
b. baiatul (frumos al său)
    boy-the nice of his
c. *acest baiatul (frumos al său)
    this boy-the nice of his
d. baiatul acesta (frumos al său)
    boy-the this nice of his

(111) [FPmax [N+art [FP4 dem [N [FP3 AP [N [FP2 dem [N [FP1 poss AP [N]]]]]]]]]]
    (Giusti 2002: 72)

In addition to the above syntactic motivation, demonstratives and the definite determiner also differ semantically. One diagnosis that can differentiate a genuine definite determiner from demonstratives is proposed in Löbner (1985) ('consistency' test in his term):

(112) # The child is loud and the child is not loud.  (Löbner 1985: 285)
(113) That boy is sleeping and that boy is not sleeping.

In (112), noun phrases with a definite determiner yield a contradiction when appearing with a predicate and its negation; whereas noun phrases with a demonstrative admit a
sensible interpretation (113). Mandarin demonstratives *zhe* 'this' and *na* 'that' behave semantically on a par with demonstratives in English:

(114) a. 

\[
\text{na ge nanhai zai shuijiao, na ge nanhai mei zai shuijiao.}
\]

that Cl boy PROG sleep that Cl boy not PROG sleep

'That boy is sleep and that boy is not sleeping.'

b. 

\[
\text{wo xihuan zhe ge nühai, bu xihuan zhe ge nühai.}
\]

I like this Cl girl not like this Cl girl

'I like this girl but don't like this girl.'

Based on the above, I adopt the views that article determiners occur in the structural position in D and that demonstratives occur in a specifier position.

Next let us move on to the argumental use of Mandarin numeral classifier phrases. As we saw in Section 2.3.2 and Section 2.3.3, just like number marking languages, Mandarin allows numeral classifier phrases to appear in argument positions with an indefinite interpretation. The indefinite interpretation, as we have shown in Section 2.2.3, is brought about by the choice function variable. The choice function is attributed to the lexical entry of numerals in the proposed analysis (c.f. Section 2.2.3). Consider the narrow scope existential reading of numeral classifier phrases in Mandarin first. One example is repeated in (115), with the analysis in (116).

(115) Property 3: narrow scope existential reading

\[
\text{wo kanjian le san ge xuesheng.}
\]

'I saw three students.'

(116) a. 

\[
\text{CIP}
\]

\[
\text{NumP}
\]

\[
\text{Cl'}
\]

\[
san_{f_3}^f
\]

\[
\text{Cl}
\]

\[
\text{NP}
\]

\[
ge
\]

\[
xuesheng
\]

As we can see, the analysis in (116) allows Mandarin numeral classifier phrases to be argumental, leaving no room to project a DP in the syntax for indefinite numeral classifier phrases. Thus, Mandarin is D-less at the numeral classifier phrase level.

The lexical analysis of choice function also allows Mandarin numeral classifier phrases to have the long distance interpretation if a sentence contains other scope-bearing element(s). This long-distance ability can be explained in the same ways as it is in number marking languages (c.f. (40) in Section 2.2.3). An example from Mandarin is repeated in (117).
Property 4: **long-distance scope and island-escaping ability**

\[ \text{ruguo ni neng dai yi ge xuesheng lai wo-de party de-hua}, \]

if you can bring one student come my party if

\[ \text{wo hui hen kaixin}. \]

I will very happy

‘If you can bring one student to my party, I will be very happy.’

\[ \text{one} > \text{if or if} > \text{one} \]

The syntax and semantics of the example in (117) is as follows. In (118ia), the existential closure is within the antecedent of the conditional, a narrow scope reading derived, which is paraphrased as in (118ib) (with irrelevant details omitted). If the existential closure is performed outside the conditional (118iia), a wide scope interpretation is achieved, as paraphrased in (118iib).

Very crucially, in the wide scope reading in (118ii), the choice function is existentially closed (\( \exists f \)) outside the conditional (the island-escaping behavior) without extracting the indefinite numeral classifier phrase \( \text{yi ge xuesheng} \) 'one student' out of the adjunct island; thus island constraints are not violated under this choice function analysis of numerals. I illustrate its structure in (118iii) (with irrelevant details omitted).

(118) i. Narrow scope reading of (119)
   a. \( \exists f [\text{CH(f)} \land [\text{dai (ni, f (\lambda x [\text{yi (x) \land ge(xuesheng) (x)]})])} \rightarrow \text{kaixin (wo)}] \]
   b. I will be happy if there is any possibility to pick one student who you will bring to the party. if one > if

ii. Wide scope reading of (119)
   a. \( \exists f [\text{CH(f)} \land [\text{dai (ni, f (\lambda x [\text{yi (x) \land ge(xuesheng) (x)]})})} \rightarrow \text{kaixin (wo)}] \]
   b. There is a choice function such that I will be happy if you bring the student it picks comes to the party. one > if
As we can see in (118iii), the indefinite CIP \( \text{yi ge xuesheng} \) ‘one Cl student’ still remains in the adjunct clause. The choice function variable \( f_\exists \) introduced in the numeral is existentially closed (\( \exists \)) outside the conditional. Since there is no movement (overt or covert) out of the adjunct clause, island-constraints are not violated. Regarding the implementation in the syntax, we can view that an agreement relation exists between the abstract existential closure \( \exists \) and the choice function in the lexical entry of numerals (e.g. analogous to the analysis of negative concord in Zeijlstra 2004).

Given that numeral classifier phrases receive an indefinite interpretation in episodic sentences, their lack of anaphoric use is expected. One example is repeated below:

(119) Property 5: lack of anaphoric use
\[
jizhe-hui \quad shang \quad lai \quad le \quad shi \quad ge \quad jizhe \quad he \quad ba \quad ge \quad xuesheng.
\]
press conference top come ASP ten Cl reporter and eight Cl student

\[
\#ba \quad ge \quad xuesheng \quad wen \quad le \quad henduo \quad wenti
\]
eight Cl student ask ASP man question

Intended: ‘Ten reporters and eight students came to the press conference; the eight students asked many questions.’

Besides receiving an indefinite interpretation, numeral classifier phrases in Mandarin can also receive a generic interpretation (as we saw in Section 2.3.3). Based on the analysis of generic sentences adopted in Section 2.2.3, I analyze an example from Mandarin (120a) with its structure and semantics illustrated in (120b/c) (with irrelevant details omitted).
**Property 6: generic reference**

a. *liang ge nansheng neng taiqi yi jia gangqi*
   
   two CL boy can lift one CL piano
   
   ‘Two boys can lift one piano.’

b. 
   
   `Gen`
   
   `IP`
   
   `NumP`
   
   `liang`
   
   `Cl`
   
   `NP`
   
   `neng`
   
   `t`
   
   `v`
   
   `V`
   
   `CLP`
   
   `taiqi`
   
   `Cl`
   
   `NP`
   
   `yi`
   
   `jia`
   
   `gangqi`

   c. \( \forall x, s \ [\text{ACC}(s_0, s) \land 2(x) \land \text{get}(nansheng)_s(x)][\text{lift}_s(x, \text{one piano})] \)

In (120), the generic numeral classifier phrase in Mandarin receives the same analysis as its English counterpart in (51) without any language-specific stipulations.

As we can see, the properties that numeral classifier phrases in Mandarin share with numeral noun phrases in number marking languages (that we saw in Section 2.3.2 and Section 2.3.3) can be accounted for via the proposed uniform analysis of numeral containing phrases in (103). However, as we saw in Section 2.3.3, indefinite numeral classifier phrases in Mandarin do differ from their counterparts in number marking languages in one respect. That is, in Mandarin, sentences containing indefinite numeral classifier phrases in the sentence initial position are usually not that natural; either a verb *you* ‘exist’ or a context is required to improve the sentence (c.f. (82)/(83)). In contrast, there is no such a restriction for number marking languages such as English and French. Some examples from Mandarin are repeated below.

(121) a. *sange xuesheng chile dangao*
   
   three CL student ate cake
   
   Intended reading: ‘Three students ate the cake.’ (A. Li 1997: 2)

b. *you san ge xuesheng chi le dangao*
   
   exist three CL student eat ASP cake
   
   ‘There were three students eating the cake.’

---

35The Num-NP ‘three boys’ here can either remain as a predicate with the Gen binding it (e.g. see Chierchia 1995), or it can be shifted through the choice function \( f_i \) to an argument with a nonspecific interpretation and being quantified over situations (e.g. see Kriftka et al 1995). The semantics of these two cases are both possible and are compatible with our analysis.
c. Context: there are three kids in the speaker’s family and the speaker refers to the three specific kids when uttering these sentences.

\[
\text{san ge haizi zai lou-shang zuo zuoye ne.}
\]

‘Three(specific) kids are doing homework upstairs.’

The distributional restriction of Mandarin numeral classifier phrases in (121a), as we saw in Section 2.3.3, is closely related to their interpretation. Indeed, a similar phenomenon is observed when Mandarin bare nouns appear in the sentence initial position, as we will see in Section 2.5. I will discuss and account for this Mandarin-specific interpretational restriction on nominals in sentence initial positions in Section 2.7.

In the next section, I will analyze the internal domain of numeral classifier phrases in Mandarin, focusing on the issues that have not been solved in (96ii), i.e. the function of classifiers and the semantics of bare nouns.

### 2.4.2 The function of classifiers and the semantics of bare nouns

This section examines bare nouns and classifiers with the goal to understand the issues regarding the differences between Mandarin and number marking languages in the nominal internal domain (96ii) (as repeated in (122)).

(122) Issues to understand regarding the differences between Mandarin and number marking languages in the nominal internal domain (‘inner differences’)

a. numerals cannot directly combine with a bare noun in Mandarin;

b. classifiers always obligatory when a numeral combines with a noun in Mandarin;

c. bare noun always directly merge with a verb and freely be argumental in Mandarin;

d. numeral-less [Cl N] phrases are only acceptable in rather restricted positions in Mandarin (i.e. only possible in certain postverbal positions).

Numerals across languages, as argued in Section 2.2, are adjectival functions from properties into quantized properties or functions from properties to entities. When numerals combine with CIPs, it follows naturally that CIPs should denote properties, type \(<e, t>\). What we need to figure out next, then, is the semantics of classifiers and that of bare nouns in CIPs. If we assume that bare nouns in Mandarin are of type \(\alpha\), the detail of which will be determined below, the type of classifiers might be of \(<\alpha, <e,t>>\) (as determined by the semantics of the numeral \(n\)). Hence, the internal structure and semantics of numeral classifier phrases in Mandarin can be treated as the one below.
To implement the idea in (123), I will consider two approaches. The first approach treats bare nouns in Mandarin and classifier languages in general as *property-denoting* of type \(<e, t>\), as suggested in Cheng and Sybesma (1999), Krifka (2004), and Borer (2005), to be discussed in Section 2.4.2.1. The second approach treats bare nouns in Mandarin and classifier languages in general as *kind-denoting* of type \(<e>\), as proposed in Krifka (1995) and Chierchia (1998b, 2010), to be presented Section 2.4.2.2. I will argue for the second approach (i.e. bare nouns in classifier languages are kind-referring) and show that the first approach is problematic theoretically and empirically, even though both approaches can derive the differences between Mandarin and number marking languages in the nominal domain.

**2.4.2.1 Approach 1 (bare nouns are property-denoting) and its problems**

Let me first consider the view that bare nouns in Mandarin and classifier languages in general denote properties, type \(<e, t>\) (e.g. Krifka 2004; Borer 2005). I will illustrate how this view derives the differences between Mandarin and number marking languages in the nominal internal domain.

Properties are generally viewed as the attribute of objects—something general to a different individual objects rather than just one object. For instance, the bare noun ‘dinosaurs’ can express properties of dinosaurs (as in ‘Stegosaurus and Diplodocus are dinosaurs.’), and the properties are attribute general to any individual instance of dinosaurs as well as a plurality of instances of dinosaurs.

If bare nouns in Mandarin are property-denoting, type \(<e, t>\), then they will have to be true of something. There are two logical possibilities.

One is to assume that these nouns are mass only properties (e.g. Krifka 2004: 193). If so, classifiers are needed to quantize these nouns, i.e. to turn mass properties into natural sub-properties (atomic or non-atomic), given that numerals need to combine with sets containing atoms/sets (c.f. Section 2.2.2). Another possibility is to assume that bare nouns in Mandarin are properties which are underspecified/undifferentiated in their mass versus count denotation (e.g. Borer 2005: 94). Under this view, every noun can apply to either whole individuals or to their parts. Hence, a noun like 'shrimp' in Mandarin, for example, will be true in a world of 'shrimps' or 'their parts' (i.e. shrimp meat). The same would have to be true of 'dog', 'table', 'water', 'blood' or any other noun. Since their denotations are unspecified, nouns in Mandarin cannot combine directly with numerals (i.e. numerals need to combine with sets containing atoms/sets). Similarly, it is reasonable to conjecture that some function becomes necessary in Mandarin to connect numerals with unspecified nouns. Classifiers provide such a function. The purpose of
classifiers, under such an analysis, is to atomize or quantize the "underspecified/undifferentiated properties" (mass or count), i.e. to enable numerals to combine with a set containing atoms/sets.

As we can see, the property-denoting approach to bare nouns can provides a natural role for classifiers and addresses the issues regarding why numerals cannot combine with bare nouns directly in Mandarin and why classifiers are always required (i.e. the properties in (124a/b)). Two examples from Mandarin below illustrate how this approach works.

(124) Bare nouns in Mandarin are property-denoting

a. i. san  ge   pingguo
   three Clindividual apple
   ‘three apples’
   ii. [[pingguo]] = apple                 <e,t>
   iii. [[san]] = λPλx [3 (x) ∧ P(x)], or <e,t>, <e,t>>
   iv. [[san]] = λPf₁(3 (x) ∧ P(x)))      <e,t>, e>
   v. [[ge]] = λPλx [AT(P)(x)]           <e,t>, <e,t>>
   vi. [[ge pingguo]] = λx [AT(apple)(x)] <e,t>
   vii. [[three ge pingguo]] = λx [3 (x) ∧ AT(apple)(x)], or <e,t>
   viii. [[three ge pingguo]] = f₁(λx [3 (x) ∧ AT(apple)(x))] <e>

b. i. san  bang    pingguo
   three Clpound apples
   ‘three pounds of apples’
   ii. [[pingguo]] = apple                 <e,t>
   iii. [[bang]] = λP λx∃n [P(x) ∧ μpound(x) = n] <e, t>, <e, t>>
   iv. [[bang pingguo]] = λx∃n [apple(x) ∧ μpound(x) = n] <e, t>
   v. [[san bang pingguo]] = λx [apple(x) ∧ μpound(x) = 3] <e, t>
   vi. [[san bang pingguo]] = f₁(λx [apple(x) ∧ μpound(x) = 3]) <e>

c. CIP<e,t,#> NumP<e,t>
    CIP<e,t> san(f₁)<e,t,#><e,t>
    Cl<e,t,#><e,t,#> NP<e,t>
    ge bang pingguo

In (124a), the bare noun pingguo 'apple' is property-denoting (124ai); the individual classifier ge in (124av) applies to a mass property or a property unspecified in mass or count and extracts the set of the corresponding atoms, providing the correct semantics for the numeral san 'three' to combine with. The atomizing function AT in the semantics of the individual classifier in (124a) takes a property and returns the set of atoms in the extension of such property (see e.g. Chierchia 2008, 2010). The analysis of individual classifiers in (124a) can be extended to other types of classifiers as well. For instance, in
(124b), the measure classifier bang ‘pound’ combines with the undifferentiated property yingtao ‘cherry’, yielding a property of ‘cherry’ measured in pound (124biii); this newly created properties which contains countable atoms/groups allows the numeral to combine with them (124biv).

Given the non-argumental type of bare nouns under this property-denoting approach, to derive bare arguments in Mandarin (e.g. (59), as repeated in (125a/b)), an argumentizing operation becomes necessary for nouns in these languages. Such an operation is not hard to justify: we can assume either a covert D in the syntax (e.g. Longobardi 1994; Borer 2005), or a type-shifting operation in the semantics (TS in short) (e.g. Chierchia 1998b; Dayal 2004, 2010), or a combination of the two (e.g. Chierchia 1998b), as illustrated in (126a/b).

(125) a. xuesheng yinggai haohao xuexi. (Mandarin)
    student should good-good study
    ‘Students should study hard.’
    ‘I bought (the) books/the book.’

(126) a. Syntactic Projection  or  b. Semantic Type-Shifting

    By assuming the argumentizing operation(s) in (126a/b), the puzzle, namely why bare noun can always directly merge with a verb and freely be argumental in Mandarin (i.e. (125c)), can be accounted for.

    The property-denoting analysis of bare nouns, however, does require additional assumptions or analyses to account for the last puzzle in (122d), namely why numeral-less classifier phrases [Cl N] in Mandarin are so restricted in argument positions as we saw in (56) (repeated in (127)).

(127) a. *ge xuesheng yinggai haohao xuexi. (Mandarin)
    Cl student should good-good study
    Intended: ‘A/The student should study hard.’

b. *wo mai le zhi mao, tiao gou he zhi tuzi.
    I buy ASP Cl cat, Cl dog and Cl rabbit
    Intended: ‘I bought a/the cat, a/the dog and an/the rabbit.’

b. wo mai le zhi mao.
    I buy ASP Cl cat
    ‘I bought a cat.’

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Specifically, since the classifiers serves to atomize or quantize the 'mass-only properties'/'underspecified properties' (mass or count), one may expect that the bare classifier-noun phrase \([\text{Cl N}]\) in Mandarin, which is property denoting (e.g. (124avi)), can be turned into arguments via the argumentizing device available in this language, e.g. a null D or a type-shifting operation, in the same way as its bare nouns are turned into arguments (126a/b). Contrary to this expectation, numeral-less classifier phrases in Mandarin are not freely argumental but very restricted in argument positions (127). It is important, however, to acknowledge that the second approach to bare nouns also faces this puzzle, as we will see in Section 2.4.2.2. I will put aside this unsolved puzzle for now and will return to it in Section 2.6.

Although the above 'property' thesis of bare nouns might seem appealing since it can derive most differences between Mandarin and number marking languages in the nominal internal domain, it runs into a series of problems.

First, a property-denoting analysis of bare nouns cannot provide good reasons to justify classifiers in general.

As both theoretical and experimental studies have argued, nouns in Mandarin and those in classifier languages in general are lexically distinguished between mass and count even though they are not overtly marked with such a distinction (e.g. Soja, Carey and Spelke 1991; Imai and Gentner 1997; Cheng and Sybesma 1999; Cheng, Doetjes and Sybesma 2008, P. Li et al. 2009; Doetjes 2012, among others).

Back in the 60s, a widespread view is that the pre-linguistic child does not make the ontological distinction between objects and substances and that the ontology underlying natural language is induced in the course of language development (Quine 1960, 1969). Quine's view meshed well with the then popular claim (often associated with the Sapir-Whorf hypothesis) that languages embody indefinitely varying ontological/conceptual systems that in turn reflect the forms of life of particular groups of speakers) (c.f. Chierchia 2010: 102). However, Quine's view has been challenged by the work of cognitive psychologists since the 80s (e.g. Carey and Spelke 1991; Imai and Gentner 1997; P. Li et al 2009, among others). In particular, Li et al (2009: 518) argue that the count-mass distinction is a pre-linguistic ontological distinction central to our deep conceptual system, universally available for all speakers and resistant to linguistic or cultural influence.

Besides the work of cognitive psychologists, linguists have also provided arguments for the mass-count distinction in Mandarin and classifier languages in general (e.g. Doetjes 1997, 2012; Cheng and Sybesma 1999; Cheng, Doetjes and Sybesma 2008). In particular, Doetjes (1997: 35) argues that classifiers and the number morphology both signal the presence of minimal parts and that ‘numerals need the presence of a syntactic marker of countability which can be either individual classifiers or number morphology’. Doetjes’s (1997) insight captures the fact that both number morphology and individual classifiers indicate notional count nouns in contrast to mass nouns. Cheng and Sybesma (1999) further argue that the mass-count distinction manifests itself through the classifier system: one class of classifiers, i.e. 'individual classifiers' (they are 'count-classifiers' in Cheng and Sybesma 1999), must combine with nouns that are notional count. In contrast, the other classes of classifiers, such as 'measure classifiers' and 'container classifiers', do
not have such a restriction, i.e. they can combine with either notional count or notional mass nouns, as examplified below.

\[(128) \quad \text{a. liang ge pingguo/xia} \quad \text{b. *liang ge rou/shui/mianfen} \]

\[
\begin{align*}
\text{two} & \quad \text{Cl}_{\text{ind}} & \text{apple/shrimp} \\
\text{two apples/shrimps'}
\end{align*}
\]

\[
\begin{align*}
\text{two} & \quad \text{Cl}_{\text{kilo}} & \text{apple/shrimp} \\
\text{two kilos of apples/shrimps'}
\end{align*}
\]

\[(129) \quad \text{a. liang gongjin pingguo/xia} \quad \text{b. liang gongjin rou/shui/mianfen} \]

\[
\begin{align*}
\text{two} & \quad \text{Cl}_{\text{kilo}} & \text{meat/water/flour} \\
\text{two kilos of meat/water/flour'}
\end{align*}
\]

The behavior of the individual classifiers presupposes that nouns in Mandarin are lexically divided to count and mass, e.g. it is the lexical property of shui 'water' and mianfen 'flour' that prevents them from combining with individual classifiers like ge in Mandarin.

If bare nouns in Mandarin are mass-only properties or are undistinguished in mass properties and count properties, the restriction on individual classifiers would have no force, and one would wrongly expect that individual classifiers like ge should work with both types of nouns just like other types of classifiers do. Hence, if nouns are properties in Mandarin, there is no good reason to justify classifiers. On the contrary, a kind-denoting analysis of bare nouns in classifier languages (Krifka 1995; Chierchia 1998b, 2010) will provides us a natural account for the obligatory existence of classifiers, as we will see shortly in Section 2.4.2.2).

Second, given the conclusion that most people are reaching, namely that the mass-count distinction is present at the lexical level or some pre-syntactic level, as we just discussed, one might expect there to be classifier languages that disallow (certain kind of) bare arguments. In particular, there ought to be an analogue of French among classifier languages that always disallow bare arguments, and overt Ds always project above bare nouns. There also ought be an analogue of English among classifier languages that disallow singular count nouns as bare arguments. Nevertheless, so far as we know, this does not happen in any classifier languages. On the contrary, the kind-denoting analysis of bare nouns in classifier languages would predict that such languages should not exist (to be shown in Section 2.4.2.2).

Admittedly, so far we only observe one language, namely French, which obligatorily projects overt Ds above all bare nominals (bare singulars, bare plurals, and mass nouns) (c.f. (15) in Section 2.2.1). If languages disallowing bare arguments to the degree that French does are already rare, very little can be concluded from the fact that a language which is a combination of Mandarin and French does not exist. Nevertheless, there should be other languages like French which disallow bare arguments (i.e. the requirement imposed by French is not actually so rare), but we should not expect these languages to be classifier languages as well. It of course remains to be seen whether this prediction is borne out as classifier languages are investigated further.

Third, if we assume that bare nouns in Mandarin and classifier languages in general are property-denoting and may require a null D in the syntax to turn them into arguments (126a), we would predict that if overt determiners develop in the grammar of a
classifier language, they should combine with bare nouns directly in the same way as the determiner \textit{the} in English combines with bare nouns (e.g. \textit{the dog, the water}). However, as we will see in Chapter 4, this is disallowed in Nuosu Yi, a classifier language with an overt definite determiner.

The above three problems lead us to an alternative analysis in which nouns in Mandarin and classifier languages in general are \textit{kind-denoting}.

2.4.2.2 Approach 2 (bare nouns are kind-denoting)

This section discusses the view that bare nouns in Mandarin and other classifier languages are kinds (i.e. entities), as proposed in Krifka (1995) and Chierchia (1998b, 2010). I will illustrate how this view derives the differences between Mandarin and number marking languages in the nominal internal domain in (122).

\textit{Kinds} are generally viewed as regularities occurring in nature and a plurality (or totality) of instances sharing some properties (Carlson 1977b: 173). For instance, in addition to denoting properties (as in \textit{‘Stegosaurus and Diplodocus are dinosaurs.’}, c.f. Section 2.4.2.1), the bare noun ‘dinosaurs’ can also refer to an entity (as in \textit{‘Dinosaurs are extinct.’}), a plurality/totality of instances with certain properties that distinguish itself from other kinds of animals, such as ‘fish’.

Very crucially, to treat bare nouns in Mandarin and classifier languages in general as kinds does \textit{not} mean that nouns are all mass or that nouns do not make a distinction between mass and count in these languages. Instead, there can be \textit{count kinds} (e.g. apple-kind) and \textit{mass kinds} (e.g. water-kind) just like there can be count properties and mass properties; whether it is a count kind or a mass kind depends on whether the instances of the kind are atomic/whole objects or not (c.f. Chierchia 2010: 131, see also Lima 2014). In other words, nouns in Mandarin do make a lexical distinction between mass and count.

Such a conclusion has been argued for by both theoretical work and experimental work (e.g. Soja, Carey and Spelke 1991; Imai and Gentner 1997; Cheng and Sybesma 1999; Cheng, Doetjes and Sybesma 2008, P. Li et al. 2009; Doetjes 2012, among others), as we just saw in Section 2.4.2.1.

I adopt the view that the mass-count distinction exists not only in number marking languages but also in classifier languages like Mandarin as argued for by the above authors. Under such a view, \textit{individual classifiers} can be viewed as atomizing functions from \textit{count kinds} to sets of atomic entities, type \textit{<e\textsuperscript{k}, <e,t>>} (e.g. Chierchia 2008, 2010; Dayal 2012, 2014). Let us look at an example to see how the kind-referring analysis works. In (130a), the numeral-classifier phrase \textit{san ge apple} ‘three apples’ has the semantics and structure in (130b) and (130c) respectively.

\begin{footnotesize}
36 Regarding why kinds are entities rather than sets, I refer the readers to Carlson (1977b: 159-173).

37 I superscript '\textsuperscript{k}' to indicate that reference is to kind level individuals and use 'e' for reference to object level individuals.
\end{footnotesize}
(130) Bare nouns in Mandarin are kind-denoting

a. \( \text{san ge pingguo} \)
   three Cl_{individual} apple
   ‘three apples’

b. i. \( [[\text{pingguo}]]=\bigcup \text{apples} \)  
    \(<e^k>\)
   \(<\text{e},t>, <\text{e},t>>\), or
ii. \( [[\text{san}]]=\lambda P\left[ 3 (x) \land P(x) \right] \)
    \( [[\text{san}]]=\lambda P f_3(\lambda x \left[ 3 (x) \land P(x) \right]) \)
   \( <<\text{e},t>, <\text{e},t>>, or <\text{e},t>, e>\)
iii. \( [[\text{ge}]] = \lambda k \lambda x \left[ \text{AT}(\bigcup k)(x) \right] \)
   \( <e^k, <\text{e},t>>\)
iv. \( [[\text{three ge pingguo}]]=\lambda x \left[ 3 (x) \land \text{AT}(\bigcup \text{apples})(x) \right] \)
   \( <\text{e},t>>, or <\text{e},t>, \text{e}>\)
vi. \( [[\text{three ge pingguo}]]=f_3(\lambda x \left[ 3 (x) \land \text{AT}(\bigcup \text{apples})(x) \right]) \)
   \( <\text{e},t>, <\text{e},t>>\)

\begin{center}
\begin{tikzpicture}
  \node (NumP) at (0,0) {NumP};
  \node (CLP) at (3,0) {CLP};
  \node (NP) at (6,0) {NP};
  \node (CL) at (2.5,1) {CL};
  \node (NP) at (6,0) {NP};
  \node (CL) at (2.5,1) {CL};
  \node (NumP) at (0,0) {NumP};
  \draw[->] (NumP) -- (CLP) node[midway,above] {san(f_3)\langle et, er\rangle\langle et, e\rangle};
  \draw[->] (CLP) -- (CL) node[midway,above] {\text{ge} \langle e, \langle e, t\rangle \rangle};
  \draw[->] (CL) -- (NP) node[midway,above] {\text{pingguo} \langle e, k \rangle};
\end{tikzpicture}
\end{center}

In (130bi), the bare noun \text{pingguo} 'apple' is kind-denoting. In (130biii), the 'up'-operator \( \bigcup \) predicitivizes kinds and maps kind-level individuals to properties (Chierchia 1984, 1998b; Partee 1986). The individual classifier \text{ge} in (130biii) applies to a count kind and extracts the set of the corresponding atoms (i.e. the atomic instances of the apple-kind), providing the correct semantics for the numeral \text{san} 'three' to combine with (Chierchia 2010). The atomizing function \text{AT} in the semantics of the classifier in (130ciii) takes a property and returns the set of atoms in the extension of such property. One consequence immediately following from the analysis in (130) is that individual classifiers will not apply to notional mass nouns (c.f. (128b)) because mass nouns do not contains atoms.\(^{38}\)

Note that, this analysis of individual classifiers in (130) can apply to other types of classifiers as well. Specifically, standard measure classifiers, like \text{bang} ‘pound’, measure parts under sum; kind classifiers, like \text{zhong} ‘kind’, measure sub-kinds; container classifiers, like \text{wan} ‘bowl’, measure parts via a fill-in-relation with respect to the noun; group classifiers like \text{qun} ‘group’, measure sets formed as groups; partitive classifiers, such as \text{ceng} ‘layer’, measure partitions.\(^{39}\) Syntactically, all these classifiers are heads, merging with a kind-referring noun and forming a larger phrase Cl', which further merges with a numeral. The semantics of each type of classifier and the internal structure of the classifier phrase are illustrated below.

\(^{38}\) Atoms can be simply defined in the traditional way: as definite singular count nouns (e.g. \text{the desk}, \text{the concept}) which are relevant only to the plural domain but not to the mass domain (e.g. Link 1983). Or, assuming that the mass domain and the plural domain both contain atoms and only differ in whether they contain minimal stable atoms (i.e. in the mass domain (e.g. \text{water}), one cannot define the minimal stable atoms; however, atoms can be well defined in the plural domain (e.g. \text{apples}) (e.g. see Chierchia 2010), the atoms checked by individual classifiers can be defined as the minimal stable ones, and these atoms still populated the denotations of definite singular count nouns, as in the traditional view.

\(^{39}\) I simplify the semantics of each type classifiers, as the details would take us too far afield. I refer the readers to Dayal (2004) for a discussion of ‘sub-kinds’, Link (1983) for ‘groups’ and Ionin and Matushansky (2006) for ‘partition’.
Semantics of classifiers

a. *ge* ‘unit’
   \[ \lambda k \lambda x \left[ AT(\uparrow k)(x) \right] \]
   = the number of objects of type \( k \) in \( x \)

b. *bang* ‘pound’
   \[ \lambda k \lambda x \exists n \left[ \uparrow k(x) \wedge \uparrow \mu_{\text{pound}}(x) = n \right] \]
   = the weight of \( x \) measured by pound is \( n \)

c. *zhong* ‘kind/type’
   \[ \lambda k \lambda x \exists n \exists Y \left[ \uparrow k(x) \wedge \uparrow \mu_{\text{kind}}(x) = n \wedge \mu_{\text{kind}}(Y) \right] \]
   = the number of contextually silent disjoint sub-kinds of \( k \) is \( n \)

d. *wan* ‘bowl’
   \[ \lambda k \lambda x \exists n \exists y \left[ n(x) \wedge \uparrow \mu_{\text{wan}}(x) \wedge \uparrow \mu_{\text{wan}}(y) \wedge \text{filled-by}(x, y) \right] \]
   = the number of bowl filled with \( y \) is \( n \)

e. *qun* ‘group’
   \[ \lambda k \lambda x \exists n \left[ \uparrow k(x) \wedge \mu_{\text{group}}(x) = n \right] \]
   = the number of group of \( x \) is \( n \)

f. *ceng* ‘layer’
   \[ \lambda k \lambda x \exists n \left[ x \leq \text{layer} \wedge \uparrow k(x) \wedge \mu_{\text{layer}}(x) = n \right] \]
   = the number of layer of \( x \) is \( n \)

In addition to providing a uniform analysis of all types of classifiers in Mandarin, the analysis in (130) and (131) has two advantages. One, it allows a common syntax for classifiers in Mandarin in which all classifiers can appear in the position preceding a noun and following a numeral (132). To demonstrate the common structure of classifiers, I repeat some examples from Chapter 1 in (133).

(132)

In addition to providing a uniform analysis of all types of classifiers in Mandarin, the analysis in (130) and (131) has two advantages. One, it allows a common syntax for classifiers in Mandarin in which all classifiers can appear in the position preceding a noun and following a numeral (132). To demonstrate the common structure of classifiers, I repeat some examples from Chapter 1 in (133).

(133) a. *san* *(ge)* *pingguo*
    three *Cl*\text{individual} apple
    ‘three apples’

b. *san* *(bang)* *yingtao*
    three *Cl*\text{pound} cherry
    ‘three pounds of cherries’

c. *san* *(zhong)* *yingtao*
    three *Cl*\text{kind} cherry
    ‘three kinds of cherries’
Numeral Classifier Phrases and Bare Nouns in Mandarin

d. san *(wan) shui
   three Cl_bowl water
   ‘three bowls of water.’
e. san *(qun) lang
   three Cl_group/ herd wolf
   ‘three herds of wolves’
f. san *(ceng) naiyou
   three Cl_layer naiyou
   ‘three layers of cream’

Two, given that each type of classifiers has its own semantics which distinguishes it from the others (131), we expect that these classifiers, despite sharing the same structure in (132), may differ in their behaviors in other structures; this prediction is born out.

One such variation is demonstrated in Chao (1968) (see also Zhu 1956, 1961; Chao 1968; Lu 1987; Cheng and Sybesma 1998, 1999; Tang 1990, 2005; X. Li 2007, 2011, 2013; Hsieh 2008; Jiang 2009; Liao and Wang 2011; D. Tsai 2011; Li and Rothstein 2012; S. Huang and Jenks 2014; Jin 2016; among many others). Chao (1968) observes that Mandarin individual classifiers behave differently with respect to de-insertion (de can be understood as a modification marker; e.g. see Chao 1968: 588). Individual classifiers resist de-insertion, but other classifiers allow it. A contrast between container classifiers and individual classifiers is illustrated below.

(134) a. san xiang de shu
   three Cl_box DE book
   ‘three boxes of books’
b. *ba ge de ren
   eight Cl_individual DE man

De-construction can receive an interpretation similar to the pseudo-partitive construction in English (c.f. Chapter 1); it describes the quantity of books as measured in the number of boxes those books fill (e.g. Cheng and Sybesma 1998; Tang 2005; X. Li 2007, 2011, 2013; Hsieh 2008; Jiang 2009; Liu and Wang 2011; Li and Rothstein 2012). Such a construction excludes the appearance of individual classifiers (132b). Regarding how this contrast can be accounted for, I refer the readers to X. Li (2007, 2011, 2013) and Jiang (2009) for analyses compatible with the kind approach to bare nouns and to Cheng and Sybesma (1998), Tang (2005), Hsieh (2008) and Liu and Wang (2011) for different analyses.

Some variation is observed in Tang (2005), X. Li (2011, 2013) and Hsieh (2008), namely, that with a certain context of quantification of ‘aboutness’ rather than ‘exactness’ of the quantity of the noun, some individual classifiers can enter de-construction if the numeral is large enough.

Other variation can be seen in Jiang (2009) (see also Tang 2005, Hsieh, 2008; Li 2011, 2013; Tsai 2011; Zhang 2013; Jin 2016; among others). Jiang observes that De-construction can express a quality-denoting interpretation with standard measure classifiers in addition to the quantity-denoting interpretation. She argues that the two
different interpretations of standard measures correspond to two different internal structures: an attributive modifier structure or a pseudopartitive structure, as Schwarzschild (2006) argues for in English. Other variation among different types of classifiers is also observed and can follow from the analysis of classifiers in (128) and (129); however, illustrating this variation here will take us too far afield. I refer the readers to Zhang (2013: 157-172) and Jiang et al (to appear) for other semantic and syntactic differences among different types of classifiers.

In addition to the above advantages, the analysis of bare nouns in Mandarin as kind-referring (128) has three immediate consequences. First, it explains why numerals cannot directly combine with a noun in Mandarin (i.e. the first puzzle in (122a)). One example is repeated in (135a). In the syntax, the numeral merges with the bare noun (135b); when numerals, which are property-seeking, combine with kind-referring nouns in the semantics, a type-mismatch arises, preventing numerals from combining directly with nouns (135c).

(135)  a. *san pingguo
       three apple
b.       NumP<<e, t>, <e, t>>   NP<<e, t>>
       'three'                     'apple'
c. i.  [[pingguo]] =  \{apples\}
      ii. [[san]] = \lambda P [3 (x) \wedge P(x)], or
           <<e,t>, <e,t>>
      iii. [[san]] = \lambda P\exists(\lambda x [3 (x) \wedge P(x)])
        <<e,t>, e>             composition impossible
      iv. [[san pingguo]] = ??

Second, the kind approach to bare nouns in Mandarin provides a natural account for the obligatory existence of classifiers (i.e. the first puzzle in (122b)): classifiers turn kind-referring nouns into properties so that the type-mismatch can be resolved (Chierchia 1998b, 2010).

Third, the analysis of bare nouns in classifier languages as kinds explains why bare nouns always directly merge with a verb and freely be argumental in Mandarin (59) (i.e. the third puzzle in (122c)). As being kind-referring, Mandarin bare nouns denote

40 Note that, to account for the complex facts regarding nominal phrases containing classifiers in Mandarin, there is growing consensus that a non-unified analysis of numeral classifiers is needed. In such analyses, both left and right branching structures are possible (e.g. X. Li 2011, 2013; Jiang 2009; Jin 2013, forthcoming; Zhang 2013; Jiang et al to appear):

(i)  a. [n [Cl NP]]        b. [[n Cl] NP]

While the above authors agree that both structures are needed, there are different proposals pertaining to the details of these structures and their distribution. I refer the readers to Zhang (2013) and Jiang et al (to appear) for a review of different proposals.
entities which satisfy the semantic requirement of a verb; therefore, they are predicted to always be argumental. I illustrate this with an example below.\(^{41}\)

\[(136)\]  
\[\begin{align*}
\text{a. } & \textit{konglong juezhong le}. \\
& \text{dinosaur extinct SFP} \\
& \text{‘Dinosaurs are extinct.’} \\
\text{b. } & [[\textit{konglong}]] = \text{``dinosaurs} < e^k > \\
\text{c. } & [[\textit{konglong juezhong le}]] = \text{``extinct} (\text{``dinosaurs}) \\
\end{align*}\]

This kind-denoting analysis of bare nouns would predict that bare arguments are always allowed in classifier languages (Chierchia 1998b, 2010). In other words, we would expect a classifier language that disallows bare arguments should not exist given that its bare nouns are inherently argumental.

Under this analysis of bare nouns and the proposed analysis of numeral classifier phrases in Section 2.4.1, bare nouns and numeral classifier phrases in Mandarin are both inherently argumental; hence it is no longer necessary, nor even possible to assume a null D in order to account for the behavior of the nominal arguments. As a result, nominal arguments in Mandarin are D-less:

\[(137)\]  
\[\text{Mandarin bare nouns and bare numeral classifier phrases: D-less}\]

\[\begin{align*}
\text{a. } & \text{NP} \\
& \text{N} \\
\text{b. } & \text{ClP} \\
& \text{NumP} \\
& n(f^k) \quad \text{Cl} \quad \text{NP} \\
\end{align*}\]

The kind-denoting approach to bare nouns, however, does require additional assumptions or analyses to account for the third puzzle in (122d), just like the property-denoting approach to bare nouns does. Specifically, since the semantics of classifiers serves to turn kind-referring nouns to sets that contain atoms/sets, such an analysis predicts that numerals are optional and that the bare classifier-noun phrase [Cl N] can be turned into arguments via argumentizing device available in this language (e.g. a null D or a type-shifting operation). However, numeral-less classifier phrases in Mandarin are so restricted in argument positions as we saw in (56) (as repeated in (138)). I will return to this issue in Section 2.6.

\[(138)\]  
\[\begin{align*}
\text{a. } & \textit{ge xuesheng yinggai haohao xuexi}. \quad \text{(Mandarin)} \\
& \text{Cl student should good-good study} \\
& \text{Intended: ‘A/The student should study hard.’} \\
\end{align*}\]

\(^{41}\) Regarding how the other interpretations of bare nouns in Mandarin come about, I will discuss it in Section 2.5.
b. wo mai le ben shu.
I buy ASP Cl book
‘I bought a book.’
c. *wo mai le ben shu, zhi bi he kuai xiangpi.
I buy ASP Cl book, Cl pen and Cl eraser
Intended: ‘I bought a/the book, a/the pen and an/the eraser.’

It is important to point out the kind-denoting approach to bare nouns in classifier languages does face empirical challenges.

A widespread view is that classifier languages do not have overt determiners (Chierchia 1998b; Bošcović 2012a, 2014). In particular, Chierchia (1998b) speculates that classifier languages should not develop article determiners in their grammar: since nouns in classifier languages are argumental, considerations of economy rule out the presence of a determiner. However, as we will see in Chapter 4, the data from Nuosu Yi alters the empirical generalization regarding classifier languages and and calls for an explanation. I will show in Chapter 4 that a modification of Chierchia's (1998b) framework is needed and that the modified framework explains why classifier languages with overt Ds are possible but rare as well as allowing us to make further predictions about classifier languages (to be shown in Chapter 5).

To summarize this sub-section, I have considered two different analyses of bare nouns in Mandarin with the goal to account for the differences between Mandarin and number marking languages in their nominal internal domain (i.e. the puzzles in (124)). I settled on an analysis in which nouns in Mandarin are kind-denoting, as proposed in Krifka (1995) and Chierchia (1998b, 2010). Classifiers, under this analysis, are required to turn kind-referring nouns into sets that contain atoms or sets. Thus, Mandarin, under this analysis, is a language with nouns of type <e>.

### 2.4.4 Summary and predictions

To summarize Section 2.4, I argued that the D-less analysis of numeral-noun phrases argued in Section 2.2.3 (c.f. (41) and (46)) can be extended to numeral classifier phrases in Mandarin (c.f. (103). As we saw, it is desirable to analyze bare numeral containing phrases across languages in a similar way since such an analysis not only accounts for their cross-linguistically uniform behaviors (as we saw in Section 2.3.2 and Section 2.3.3), but it also avoids language specific assumptions about bare numeral containing phrases. To account for the differences between Mandarin and number marking languages in the nominal internal domain (as we saw in Section 2.3.1), I argued for a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b). Specifically, I argued that language variation in the nominal domain is primarily located in two interrelated factors: what nouns denote and what lower functional heads (i.e. number morphology and classifiers) denote. I demonstrated that such an analysis of Mandarin bare nouns provides rather straightforward accounts for the key puzzles of Mandarin numeral classifier phrases—‘why numerals cannot combine directly with a bare noun’, ‘why classifiers are obligatory’, and ‘why all bare nouns can freely and directly merge with a verb’.
Importantly, bare nouns in Mandarin, under our analysis, are expected to behave like bare nominals in English (bare plurals/mass) which are also kind-referring with respect to their scope behavior. Specifically we predict that Mandarin bare nouns receive the narrowest scope existential interpretation, same as bare plurals as observed in Carlson (1977b) rather than English indefinites. This prediction is borne out by the observations made in Yang (2001) and X. Li (2011, 2013) about bare nouns in Mandarin, which I will illustrate and discuss in next section. I will also demonstrate how the different interpretations of Mandarin bare nouns are brought about with our analysis.

2.5 Bare Nouns in Mandarin

2.5.1 Scope behavior of Mandarin bare nouns

As discussed earlier, it has been observed in Carlson (1977b) that indefinites (e.g. ‘a guest’ and ‘some guests’) and bare nominals (bare plurals like ‘guests’ or mass nouns as ‘cream’) behave differently with regard to their scope behavior. Indefinites can receive both narrow scope and wide scope interpretations, while bare nominals, which are kind-referring, can only receive a narrow scope existential interpretation (c.f. (45)). One example is repeated below.

(139)  a. Miles wants to meet policemen. want > ∃/#∃ > want
    b. Miles wants to meet a policeman. want > ∃/∃ > want (Carlson 1977b: 16)

Since Carlson (1977b), bare nominal argument terms have been treated to refer to kinds (e.g. Carlson 1977b; Krifka 1988; Wilkinson 1991; Chierchia 1998b; Dayal 2004). If we assume bare nouns in Mandarin are uniformly kind-referring, we predict that their scope behavior should resemble that of English bare nominals rather than that of its indefinites. This prediction is borne out.

Yang (2001), Dayal (2004), and X. Li (2011, 2013) examine bare nouns in Mandarin in detail; they observe that bare nouns in Mandarin do not exhibit any of the long-distance scope behavior of English indefinites like ‘some NPs’ or ‘a NP’. Instead, Mandarin bare nouns behave like English bare nominals and receive the same narrowest scope interpretation in relation to other scope-bearing elements.

Let us first look at one example from Yang (2001). In (140), the bare noun wenti ‘problem’ can receive a definite interpretation which does not enter scope relations (140i) and a narrow scope existential reading (140ii); however it cannot receive an intermediate scope interpretation like indefinites ‘some problem’ or ‘a problem’, as paraphrased in (140iib).

42If not considering the view that definite expressions do not enter scope relations, there is another view by Reinhart (1997) and Ruys (1992) which treats definites to take the maximal/widest sentential scope. Yang (2001) indeed treats definites in this way. However, whether definites enter scope relations is not quite relevant for the purpose of discussion here.
(140) dabufen yuyanxuejia dou kan-guo mei-ge [jieju wenti de] fenxiangfa.
most linguist all look-ASP every-Cl solve problem MOD analysis
(i). ‘Most linguists have looked at every analysis that solves the problem.’
(ii). ‘Most linguists have looked at every analysis that solves problems.’
   a. Narrow scope: [most >\forall > problems]
   b. *Intermediate scope: *[most >some problems/a problem >\forall]
      Intended: ‘For most linguists, there are some problems/there is a problem
      that they have looked every analysis of’ (Yang 2001: 28)

Look at another example by X. Li (2011). In (141), the (modified) noun xin ‘letter’
cannot receive the wide scope interpretation in (116ii). The only possible readings are the
narrow scope reading (141ia) and the definite interpretation in (141ii).

(141) mei ge ren dou zai kan guanyu jiaxin de xin.
every Cl man all PROG read about add-wage MOD letter
(i). ‘Everybody is reading letters about raising salaries.’
   a. Narrow scope: \forall > letters
   b. *Wide scope: *[some letters/a letter >\forall]
      Intended: ‘There is a letter/ There are some letters about raising salaries that
everybody is reading.’
(ii). ‘Everybody is reading the letter about raising salaries.’
      (X. Li 2011: 63)

The above examples containing bare nouns contrast with the examples containing bare
numeral classifier phrases which can receive a wide scope or an intermediate scope
reading in addition to a narrow scope reading as we saw Section 2.3.2 (c.f. (62) - (68)).
Some examples are repeated in below.

(142) mei ge ren dou zai kan yi feng guanyu jia xin de xin.
every Cl man all PROG read one Cl about add salaries MOD letter
‘Everybody is reading a letter about raising salaries.’
(i). Wide scope a letter > \forall
(ii). Narrow scope \forall > a letter (X. Li 2011: 63)

(143) dabufen laoshi dou anwei le [mei yi ge
most teacher DOU console ASP every one Cl
[bei yi ge pinazi pian le qian] de xuesheng]
PASSIVE one Cl swindler con ASP money MOD kid
Lit: ‘Most teachers consoled every student who was conned out of money by a
swindler’
(i) Intermediate scope: most teacher > one swindler > every student
(ii) Narrow scope: most teacher > every student > one swindler
The analysis that Mandarin bare nouns are kind-referring correctly predicts their scope behavior, which resembles English bare nominals and not English indefinites. In the next section, I briefly summarize the interpretations and the distribution of Mandarin bare nouns; I illustrate in Section 2.5.3 that the analysis of bare nouns in Mandarin as kinds can also derive their other interpretations in a principled manner.

2.5.2 Interpretations and distributions of Mandarin bare nouns

As noted in the literature (e.g. Krifka 1995; F. Liu 1997; Cheng and Sybesma 1999; Yang 2001), Mandarin bare nouns can appear with kind-level predicates to receive a kind reference (144i), they can appear in generic sentences with a generic reference (144ii), and lastly, they can also appear in episodic sentences receiving a definite or a narrow scope existential interpretation (144iii).

(144) Mandarin Bare nouns
(i) bare nouns with kind level predicates
   xiong jue-zhong le.
   bear vanish-king ASP
   ‘The bear is extinct.’
   (Krifka 1995: 1)
(ii) bare nouns in generic sentences
    gou hen jiling.
    dog very smart
    a. ‘Dogs are intelligent.’
    b. ‘The dog(s) is/are intelligent.’
    (Yang 2001: 20)
(iii) bare nouns in episodic sentences
    a. wo kanjian gou le.
    I see dog ASP
    (i). ‘I saw some dog(s).’
    (ii). ‘I saw the dog(s).’
    b. waimian gou zai jiao
    outside dog PROG bark
    (i). ‘Outside, dogs are barking.’
    (ii). ‘Outside, the dog(s) are/is barking.’
    (Yang 2001: 20, 32)

As for their distribution, bare nouns can appear in both preverbal and postverbal positions, as shown above in (144iii).

Note that, it has been observed in very early work, such as Chao (1968) and Li and Thompson (1981), that in subject positions, Mandarin bare nouns have a strong tendency to be interpreted as definite. Two examples to illustrate this are given in (145).

(145) a. ke lai le.
    guest come ASP
    ‘The guests have come.’
    (Chao 1968: 76)
b. *gou yao guo malu.*
   dog want cross road
   ‘The dog wants to cross the road.’ *not: A dog wants to cross the road.’
   (Cheng and Sybesma 1999: 510)

When adding the verb *you* 'exist/have' in the sentence initial position, the bare noun in the subject position receives an existential interpretation, as illustrated in (146).

(146) a. *you ke lai le.*
   exist guest come ASP
   ‘There are guests coming.’
   b. *you gou yao guo malu.*
   exist dog want cross road
   ‘There are dogs wanting to cross the road.’

In later work, however, it has been observed that various examples do not follow this tendency (e.g. J. Huang (1997); Yang (2001)). In J. Huang (1997), it was observed that bare nouns in sentence initial positions can receive an interpretation similar to English bare plurals, as exemplified in (147).

(147) a. *yuyanxuejia you zai chaonao le.*
   linguists again at quarrel ASP
   ‘Linguists are quarreling again.’
   b. *lang lai-le!*
   wolf come-perf
   ‘Wolves are coming!’ (J. Huang 1997: 372)

Yang (2001) further observes that the existential reading of bare nouns become immediately available on preverbal bare nouns, once they occur in the context of leftperipheral *locatives*, as shown in (144iiib) (as repeated in (148)).

(148) *waimian gou zai jiao*
   outside dog PROG bark
   (i). ‘Outside, dogs are barking.’
   (ii). ‘Outside, the dog(s) are/is barking.’ (Yang 2001: 32)

Importantly, the behavior of Mandarin bare nouns as presented above is analogous to that of numeral classifier phrases in sentence-initial positions that we saw in Section 2.3.3, namely that without contexts provided it is unnatural for Mandarin indefinite numeral classifier phrases to appear in the sentence initial position and that adding the verb *you* 'exist/you' in the sentence initial position can make such sentences natural. A pair of examples are repeated below.
(149) a. Without contexts, numeral indefinites are unnatural in sentence initial position

\[san\ ge\ xuesheng\ chi\ le\ dangao\]

three Cl student eat ASP cake

Intended reading: ‘There are three students ate the cake.’

b. \[you\ san\ ge\ xuesheng\ chile\ dangao\]

exist three Cl student ate cake

‘There were three students eating the cake.’

c. Context: there are three kids in the speaker’s family and the speaker refers to the three specific kids when uttering these sentences.

\[san\ ge\ haizi\ zai\ lou-shang\ zuo\ zuoye\ ne.\]

three Cl kid at stair-up do homework SFP

‘Three (specific) kids are doing homework upstairs.’

The interpretational tendency of bare nouns and the related phenomenon regarding numeral classifier phrases as seen in (145) to (149) will be further discussed and accounted for in Section 2.7. In the following section, I will illustrate that the analysis of bare nouns as kinds not only captures their scope behavior but also derives their other interpretations in (144).

2.5.3 Derive other interpretations of bare nouns from kinds

In this section, I illustrate that the object level meanings of bare nouns in Mandarin can be derived from their basic kind level meanings within a Neocarlsonian account of bare nominals (Carlson 1977b, 1989; Chierchia 1998b, 2010, 2016; Dayal 2004, 2011a). This approach has been pursued in Yang (2001) and X. Li (2011, 2013) for Mandarin. The Neocarlsonian account includes a set of ranked type-shifting operations and a principle blocking covert type-shifting operations in the presence of corresponding overt correspondents. Justification for the choices made here over other possibilities will be presented in Chapter 4, Section 4.8.6, after I discuss a typologically unusual classifier language Nuosu Yi.

I give below the specific version of the Neocarlsonian approach adopted in this work, due to Chierchia (1998b), with the specific modification of *Rank of Meaning* from Dayal (2004).

(150) Chierchia's (1998b) type-shifting operations.\(^{44}\)

a. Kind-related type shifts:

(i) Predicativize: \(\forall k = \lambda x [x \leq k_s]\), if \(k_s\) is defined, else undefined. \(<e^k>\rightarrow<e,t>\)

(ii) Derived Kind Predication (DKP):

If \(P\) applies to objects and \(k\) denotes a kind, then \(P(k) = \exists x[\forall x k(x) \land P(x)]\)

Note that bare nouns in Mandarin can appear in predicate position in addition to serving as arguments. Such a predicative use of bare nouns in classifier languages can be obtained via type-shifting mechanisms of the kind discussed in Partee (1986) and Chierchia (1982, 1984, 1998b).

For simplicity, I avoid reference to the world argument. For instance, I treat \(\cap\), \(\cap\) and \(\exists\) as functions of type \(<e,t>, e/<<e,t>,t>>\) rather than \(<s, <e,t>>, e/<<e,t>, t>>\.)

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\(^{43}\) Note that bare nouns in Mandarin can appear in predicate position in addition to serving as arguments.

\(^{44}\) For simplicity, I avoid reference to the world argument. For instance, I treat \(\cap\), \(\cap\) and \(\exists\) as functions of type \(<e,t>, e/<<e,t>,t>>\) rather than \(<s, <e,t>>, e/<<e,t>, t>>\.)
b. Three canonical argument forming type-shifts (ARG):

(i) Nominalization: \( P = \lambda s \vdash P, \) if \( \lambda s \vdash P \) is in \( K \), else undefined. \( <e, t> \rightarrow <e^k> \)

(ii) Iota: \( \iota X = \) the largest member of \( X \) if there is one, else, undefined.

\( <e, t> \rightarrow <e> \)

(iii) Existential closure: \( \exists X = \lambda P \exists y[X(y) \land P(y)] \)

\( <e, t> \rightarrow <<e, t>, t> \)

(151) a. **Ranking of Meaning**:

(i) \( \land \land \) > \( \{\iota, \exists\} \);

(ii) \( \{\land, \iota\} \) > \( \exists \) (revised in Dayal (2004))

b. **Blocking Principle** (‘Type Shifting as Last Resort’)

For any type shifting operation \( \tau \) and any \( X : * \tau(X) \), if there is a determiner \( D \)

such that for any set \( X \) in its domain, \( D(X) = \tau(X) \)

In the two kind-related type shifts in (150a), the 'up'-operator \( \land \) predicativizes kinds and maps kind-level individuals to properties. In (150b), the three canonical argument forming operations turn properties into arguments. The 'down'-operator \( \iota \) in (150bi) nominalizes, mapping those properties that correspond to kinds to kind individuals (e.g. Chierchia 1984; Partee 1987). Importantly, plural properties can be turned into kinds, but singular ones cannot. This is so because the semantics of singularity clashes with the conceptual notion of a kind which corresponds to the plurality of all instances of the property (Dayal 1992; Chierchia 1998b). In (150bi), the iota operator ‘\( \iota \)’ shifts properties to arguments with a definite interpretation and is used to interpret the definite article *the* in English (e.g. Sharvy 1980); in (150biii), ‘\( \exists \)’ shifts properties into existential generalized quantifiers and is traditionally taken to be the meaning of the indefinite article *a/an* in English (e.g. Montague 1974: 216).

In Chierchia (2016), a uniform term "ARG" is used to represent *covert* argument-forming operations which turn properties into arguments, i.e. a null \( D \) in the syntax and a invisible type-shift in the semantics. ARG can be viewed as a variable ranging over the three canonical argument forming operations: \( \land \), \( \iota \), and \( \exists \) in (150b), and its interpretation is subject to the two principles in (151), **Ranking of Meaning** and **Blocking Principle**. I adopt Chierchia’s term 'ARG' in this work and use it to represent either a null \( D \) in the syntax and a invisible type-shift in the semantics, both of which are covert argument forming operations.

A crucial point for the Neocarolsonian view is the difference between the indefinite readings of bare plurals and ordinary indefinites, as observed in Carlson (1977a, b), as we saw in (45). I repeat the examples below, in which bare nouns allow only narrow scope indefinite readings, while indefinites participate in scope interaction:

(152) a. Miles wants to meet *policemen*. \( \text{want} > \exists/\exists > \text{want} \)

b. Miles wants to meet *a policeman*. \( \text{want} > \exists/\exists > \text{want} \) (Carlson 1977b: 16)

(153) a. John didn’t see *spots* on the floor. \( \neg > \exists/\exists > \neg \)

b. John didn’t see *a spot* on the floor. \( \neg > \exists/\exists > \) (Carlson 1977b: 19)
Furthermore, indefinites can also receive an intermediate scope interpretation, as we have seen in Section 2.2.1.

Regarding the narrow scope existential reading of bare nominals in episodic sentences (152a)/(153a), Chierchia (1992, 1998b) proposes a sortal adjustment operation, Derived Kind Predication (DKP in short). DKP adjusts predicates when a sentence has a predicate that is primarily object-level with a kind-level argument by introducing a local existential quantification over instances of the kind, which derives the existential interpretation of bare nominals from their kind denotation. DKP is defined in (154a) and illustrated in (125b-d).

\[(154)\]
\[a. \text{Derived Kind Predication (DKP):} \quad \text{(Chierchia 1998b: 364)}\]
\[
\text{If } P \text{ applies to objects and } k \text{ denotes a kind, then } P(k) = \exists x[\neg k(x) \land P(x)]
\]

b. Dogs chased cats.
c. [[dogs chased cats]]
   (via DKP) = \exists x\exists y [\neg dogs(x) \land \neg cats(x) \land chased (x, y)] = (123a)
d. ………

```
  dogs
    \exists
      vP

            v

        VP

    \exists
      chase
cats
```

As this existential quantification in (154) is locally introduced, DKP has the advantage in explaining the narrow scope behavior of bare plurals, like the one in (152)/(153).

The above difference between bare nouns and indefinites in (152) and (153) is then explained via the sortal adjusting operation DKP in (150aii) and the (choice function variable that is subject to) existential closure \(\exists\) in (150biii): the former derives the obligatory narrow scope indefinite reading of kind-denoting bare nominals (153a)/(153a), and the latter derives the flexible scope interpretations of ordinary indefinites (152b)/(153b) (as we saw in Section 2.2.3).

DKP bears some analogy with noun-incorporation (van Geenhoven 1996; McNally 1995; Dayal 2011a) in that it behaves like a lexical operation on the predicate. The noun incorporation analysis assumes that nouns simply denote properties. The mismatch between property-denoting nouns and verbs, which take objects as arguments, are solved with a lexical operation on the predicate which introduces an existential quantifier over instances of the property. I illustrate the effects of this operation on a simple verb in (i). However, as argued in Chierchia (1998b), DKP is more explanatory than noun-incorporation for the following reason. DKP, a type shifter that applies on demand, can explain sentences like the ones in (ii) which receive either a kind-oriented reading or an object-oriented reading. In contrast, noun incorporation, a lexical operation
on the predicate, can only account the object-oriented reading in (ii) (see Chierchia 1998b: 365-366 for details).

(155) \[ \text{chase} \rightarrow \lambda P \exists x [P(x) \land \text{chase} (x)] \]

(156) a. Dogs were biting themselves.
    b. Goldfish were biting people who were admiring them.

(Chierchia 1998b: 365, ex (33b), (34))

In addition, DKP can also account for the suspension of scopelessness of modified bare nominals as the one in (157). The property-denoting nominal ‘roses that I was looking for’ cannot be defined as a kind (as typical kind-level predicates are marginal with nominals of this sort), so after the kind operator applies to it, ‘\(\cap\)’(roses that I was looking for’) cannot be well defined (as kinds). Accordingly, the only other way to make this property-denoting nominal argumental is through a regular existential generalized quantifier \(\exists\), which should be expected to interact scopally with other scope-bearing element. This, indeed, is the case: the modified nominal in (157) can take wide scope over negation, thus suspending the scopelessness of bare arguments, in contrast with (153).

(157) Suspension of scopelessness of modified bare arguments

I didn’t find \textit{roses I was looking for}. \(\exists > \neg\)

Next, let me briefly discuss the reason for the ranking in (151a) that I adopt. In Chierchia (1998b), ‘\(\cap\)’ ranks over ‘\(\exists\)’ and ‘\(\forall\)’ (151ai); this ranking is motivated by the fact that (English) plurals generally favor the kind interpretation over the indefinite one (158a). Chierchia claims that ‘\(\exists\)’ comes into the picture when ‘\(\cap\)’ is undefined (158b, c).

(158) a. Machines are widespread.
    b. ?? Parts of that machine are widespread.
    c. ?? Boys sitting here are rare.     (Chierchia 1998b)

A further explanation is that ‘\(\cap\)’ only changes the type of its arguments without changing the information associated with it, but ‘\(\exists\)’ introduces quantificational force in addition to changing the type of its arguments. Kind formation ‘\(\cap\)’, therefore, is more meaning-preserving than ‘\(\exists\)’ and should get picked whenever possible. Dayal (2004), however, notes that Chierchia’s ranking in (151ai) would block bare nominals in determiner-less languages from having any object level meaning, definite or indefinite. She also notes that the same reasoning that favors ‘\(\cap\)’ over ‘\(\exists\)’ should apply to ‘\(\forall\)’ as it also merely changes the type of its arguments without adding quantificational force. The revised ranking (151aii) explains the fact that bare nominals can denote kinds as well as contextually-salient entities in languages without definite determiners, such as Hindi and Russian. That is, definite readings are never blocked by kind formation in such

\(^{45}\) Such readings are further discussed in Dayal (2013).
languages. Ranking ‘∃’ below ‘ ’ is based on her claim that bare nouns in such languages are not bona fide indefinites and that their indefinite readings are derived from their kind-level meaning:

(159) a. kamre meN cuuhee nahiiN haiN (Hindi)
room in mice not are
‘There aren’t any mice in the room.’ \( \neg > \exists / \exists > \neg \)
b. waimian gou mei zai-jiao. (Chinese)
outside dog not be-barking
‘Dogs are not barking outside.’ \( \neg > \exists / \exists > \neg \) (Dayal 2004)

The last piece of the Neocarlsonian account of bare nominals that will be relevant to us is the Blocking Principle in (151b) that favors overt type-shifting operations over the corresponding covert ones. The Blocking Principle is what explains the difference between the anaphoric potential of bare nominals in languages like English as opposed to languages like Hindi or Mandarin, for example:

(160) a. Some children came in. *(The) children were happy. (English)
b. kuch baccei aaye. baccei bahut khush lage. (Hindi)
some children came children very happy seemed
‘Some children came. The children seemed very happy.’ (Dayal 2004)

With this background in place, let us return to Mandarin. Yang (2001) and X. Li (2011) examine bare nouns in Mandarin in detail and argue that bare nouns in Mandarin denote kinds in the same way as English bare nominals do. As they are kind-referring, bare nouns in Mandarin can also achieve their narrow scope existential reading via DKP; thus their scope behavior is correctly captured and predicted by the original assumption that bare nouns in Mandarin are kind-referring. The generic interpretation of bare nouns in Mandarin can also be explained in the same way as for English bare nominals, i.e. Gen can operate directly on kind-denoting nominals and introduce variables ranging over instances of the kind, so the generic references of the bare nominal in generic sentences is predicted and captured (Chierchia 1998b).

I present the account in Yang (2001) that derives the different readings of bare nouns in Mandarin in (144), as repeated in (161a-c):

(161) a. xiong juezhong le.
bear extinct Asp
‘bears are extinct.’ = extinct (^bears)
b. gou hen jiling.
dog very smart
(i). ‘Dogs are smart.’ = Gen x, s (^\( \rightarrow \)dogs (x))[smart (x, s)]
(ii). ‘The dog(s) is/are smart.’
c. wo kanjian gou le.
I see dog Asp
(i). ‘I saw some dog(s).’ (via DKP) = \exists x [\text{dogs} (x) \land \text{see} (I, x)]
(ii). ‘I saw the dog(s).’ = saw (I, \text{dogs} (x))

(Yang 2001)

Note that, although DKP can derive the narrow scope existential reading of bare nouns direct from kinds, their ‘definite’ interpretation still needs to be accounted for. Yang (2001:31-32) proposes that the definite interpretation of Mandarin bare nouns is given by the iota operator in the semantics, as shown in (161cii). Yang first applies the type-lifting up-operator \(\text{^}\) to the Chinese kind-denoting bare noun to turn it into properties, and then applies the iota operator to the property created by the up-operator, as demonstrated below.

(162)

\[
\begin{align*}
& t (\text{^}\text{N<e>}) \\
& \downarrow \\
& \text{^}\text{N<e^k>} \\
& \downarrow \\
& \text{N<e^k>} = \text{kind-referring}
\end{align*}
\]

Although the approach in (162) can derive the definite reading from the kind reference, it faces one theoretical problem and one empirical problem, which I will present below. These problems will lead us to pursue a simpler way to derive definites from kinds.

Theoretically, the approach in (162) is not economic since it involves redundant computational steps, which is a departure from computational efficiency, a third factor principle (Chomsky’s 2005 term) not specific to but also applicable to the human faculty of language. To illustrate, type-shifting or D is supposed to repair type mismatch and make the ‘unsaturated’ predicative noun saturated and argumental (as in Higginbotham 1987 Szabolcsi 1992). Nevertheless, in (162) type mismatch is ‘created’ ‘on purpose just so it can feed the use of type-shifting in semantics. Furthermore, an already argumental noun is ‘forced’ to turn non-argumental and then back to argumental in (162), which involves two redundant operations in that it gives rise to the same ‘argumental’ result. Although these two operations return an individual different from the one that we start with, they are still less economic if we can achieve the same result with only one operation.\(^{46}\)

\(^{46}\)As suggested by Amy Rose Deal, the two steps in (162) indeed could be a one-step operation, like the one below.

(i) One-step Type-shifting:
\[
\begin{align*}
&t \text{y (^}\text{N<e^k>})(y) \\
&\downarrow \\
&\text{N<e^k>}
\end{align*}
\]

However, it is unclear how these two operations \(\text{^}\) and \(t\) are ‘fused’ into one step: do they apply simultaneously or are there additional assumptions to make here? Even if the two operations apply at once...
In addition to being theoretically disfavored, the approach in (162) is also not supported by cross-linguistic data. In Chapter 4, a classifier language Nuosu Yi will be shown to have an overt definite determiner *su which has the same functions as the determiner *the in English. If the assumption in (162) is not language specific but apply universally, one would predict that the definite determiner *su in Nu Yi should be able to combine with kind-denoting bare nouns after they are turned into properties by the type-lifting up-operator *r-h and derive a definite interpretation, like (163a). However, this prediction is not borne out: *su can never be used directly with a bare noun in Yi without a classifier (163b). Crucially, bare nouns in Yi behave like those in Mandarin and can also receive a definite interpretation in addition to the definite classifier phrases with *su (the details will be provided in Chapter 4). If the assumption in (162) is language-specific that only applies to some classifier languages like Mandarin, we would like to know why it does not apply to some other classifier languages, like Nuosu Yi, and how the definite interpretation of bare nouns in Nuosu Yi is obtained.

(163)  
a.  *su *(\wedge \text{horses}(x)) = \text{t} *(\wedge \text{horses}(x))  

b.  *mu _su li ndo o  
    Horse Det lose Past

Given the above challenges, let us consider a simpler approach to derive definites from kinds. A direct way to obtain the definiteness, as proposed in Jiang (2012, 2014, 2018), is by plugging into the kind a situation variable, provided by the context. This operation applies to kinds by restricting them to specific situations so that the definite interpretation can be obtained, as demonstrated in (164).

(164)  Situation Restriction (SR) 
      \[ [N_{<e^k}>]_s \rightarrow [N_{<e>}] = \text{the maximal member instantiating } N_{<e^k}\text{ in a situation } s \]

From here on, let Situation Restriction (SR in short) refer to the above strategy. Since kinds are functions from situations to (possibly plural) individuals (e.g. see Chierchia 1998b: 349), by applying them to a ‘resource’ situation (an analogue of Domain Selection, e.g. see von Fintel 1994; Elbourne 2001) we get an individual e. Situation Restriction can be viewed as a function from kinds to situation restricted kinds, of type \(<e^k, e>\); it restricts kinds to a specific situation and obtains the maximal members in that situation provided the context. Importantly, the function of SR is the same as that of the iota operator (\(\text{t}\)), the canonical Frege-Russell definition of ‘the largest member of X if there is one (else, undefined)’ (c.f. Chierchia 1998b: 346 and see Sharvy 1980 for the same analysis for English definite determiner). Thus, via SR, a definite interpretation of bare nouns can be achieved. (One might also note that reference to the maximal sum in a situation here plays a role similar to reference to stages in Carlson’s 1977 theory.)\textsuperscript{47}

\textsuperscript{47}Note that there could be a number of ways of obtaining definiteness from kinds. SR is one such way, so is a new type of iota of type \(<e^r, e>\) which directly gives rise to the definiteness of kind-referring bare nouns.
Note that, the proposed approach to derive definites from kinds for Mandarin bare nouns is along the same lines in Tue (2011) and Dayal (2011b, 2012). In particular Dayal (2012) derives the definite reading of Bangla bare nouns via taking the extension of the kind at the evaluation index, as illustrated below:

\[ (165) \text{barking}(s)(\text{dogs}) \Rightarrow \text{barking}(\text{dogs}(s)) \quad \text{(Dayal 2012)} \]

I illustrate how Situation Restriction works with an example repeated below. The bare noun nansheng ‘boy’ in (166a) receives a definite interpretation that refers anaphorically to the noun ‘a boy sitting in the house’ in the antecedent sentence. The definite interpretation of nansheng ‘boy’ is achieved by applying Situation Restriction to the extension of nansheng ‘boy’ and obtaining the maximal member that instantiates the boy-kind in a situation \( s' \). Syntactically, the bare noun nansheng does not have any further functional projection above it— it is simply a bare noun, as shown in (166b). The bare noun is interpreted in the semantics as definite through Situation Restriction (166c), and the whole sentence in (166a) has the semantics in (166d).

\[ (166) \]

a. jiaoshi li zuo zhe yi ge nansheng yi ge nuisheng,
   classroom inside sit PROG one Cl boy one Cl girl
   nansheng kan-qi-lai you er-shi sui zuoyou.
   boy look have two-ten year or so
   ‘There is a boy and a girl sitting in the classroom, the boy looks like twenty-year-old or so.’

b. Syntax  \( \Rightarrow \)  c. Semantics
   \[ N [[\text{nansheng}]] = [\text{boys} <_{K}>_{s'}] \]
   = the maximal member instantiating \( \text{boy}_{eK} \) in a situation \( s' \)

| nansheng
   ‘boy’
   d. (166a)
   \[ \exists s \exists x [\text{boys} (x) \land \mu_{\text{atom}} (x) = 1 \land \exists y [\text{boys} (x) \land \mu_{\text{atom}} (x) = 1 \land \text{sit in the classroom} (s, x \cup y)] \land \exists s' [\text{looks like 20 or so} (s', \text{BOY} (s))]] \]

The proposed Situation Restriction shares similarities with the E-type anaphora which is analyzed as definite articles followed by an NP which is deleted in the phonology in Elbourne (2001). SR plugs into kinds a situation variable provided by the context, deriving a definite interpretation of bare nouns. As for the E-type anaphora in donkey sentences like ‘if a farmer owns a donkey, he beats it’, the definites (i.e. the anaphora) in the consequent referring to entities introduced in the antecedent have the situation variables of predicates in the antecedent (c.f. Elbourne 2001: 260).

Crucially, this ‘maximal member’ view of definiteness in Mandarin bare nouns differs from what X. Li (2011) and Li and Bisang (2012) propose for definiteness in

However, they are both the same idea, and the ‘new iota’ will be undistinguishable from the situation restriction that we proposed.
Mandarin, according to whom definiteness is characterized by the pragmatic notion of ‘identifiability’. Their view of definiteness might be too weak to capture the anaphoric use of bare nouns. Bare nouns in Mandarin can anaphorically refer to the maximal plural member in an antecedent clause, as illustrated below.

(167) a. Wo mai le shi ba yizi he shi zhang zhuozi.
I buy Asp ten Cl chair and ten Cl desk.
Zhuozi shi cong deguo jinkou de.
Desk is from Germany import De.
‘I bought ten chairs and ten desks. The desks were imported from Germany.’
b. Wo jia yang le shi zhi wu-gui. Wu-gui zaoshang bu zenme chi dongxi.
I family raise Asp ten Cl turtle. Turtle morning not how eat things
‘My family has ten turtles. The turtles do not eat that much in the morning.’

Merely being able to identify with some members rather than the maximal member in a specific situation is not strong enough to capture the anaphoric use of Mandarin bare nouns which can denote the largest members in a domain. This anaphoric use of bare nouns in Mandarin requires the source that contributes to its definiteness to function as the canonical Frege-Russell definition of the iota operator (ι).

The identifiability and maximality difference in Mandarin bare nouns is reminiscent of a similar phenomenon in English, which is not fully understood. As observed by Condoravdi (1997), English bare plurals can be used to refer to a context-anchored particular plural individual as in (168a). Similar examples have been provided by Dayal (2013), as in (168b, c):

(168) a. In 1985 there was a ghost haunting the campus. Students/The students were aware of this fact/the danger.  (Condoravdi 1997: 69)
b. My garden is in shambles. Groundhogs/The groundhogs eat up whatever I plan.
c. The bus stopped. Passengers/The passengers quickly got off the bus.  (Dayal 2013, ex (19b, c))

The referential ability of the bare plurals in (168) seems to suggest that bare plurals in English behave like definite plurals and also seems to suggest the operation of iota (c.f. Dayal 2013). Nevertheless, we cannot equate bare plurals in English in (168) with definite plurals. There are at least two reasons discussed in Dayal (2013). First, there are structurally parallel sentences such as the ones in (167) where the bare plurals appear infelicitous and definite plurals have to be used (cf. Dayal 2013:58).

(169) a. I bought a car. The wheels/*Wheels need to be replaced
b. John has a rope. The fibers/*Fibers are made of nylon.
c. Sue visited the ancient monument. She found the stones/stones impressive.  (Dayal 2013, ex (20))

Second, bare plurals in English do not admit anaphoric definite readings (cf. Dayal 2013:54). For example in (170), the bare plural 'children' cannot be used anaphorically to
refer to the maximal member in the antecedent clause, and the definite determiner 'the' has to be used. The anaphoric ability in (170) is enforced and defined by the iota operator and brought up via the definite determiner (the), and this is an ability that bare plurals lack.  

(170) Some children, came in. Children sat down. (Dayal 2013, ex (10a))

Turning to bare nouns in Mandarin, they have a wider range of usages than bare plurals in English, i.e. they receive a definite interpretation and behave like definites in English in addition to the existential and kind interpretations, as we saw in (161). Below we provide three examples from Mandarin in (171) to (173) which correspond to the three cases in (168) to (170) above. We can see that bare nouns in Mandarin can be used in all of the three cases above.

(171) 1985 nian, you yi zhi gui chumo zai xiaoyuan li.
1985 year exist one Cl ghost haunt in campus inside.

xuesheng dou zhidao zhe jian shi.
student all know this Cl incident.
'In 1985 there was a ghost haunting the campus. Students/The students were all aware of this incident.'

(172) wo gang mai le yi liang che. Lunzi haoxiang you dian wenti.
I just buy Asp one Cl car. Wheel seem have a bit problem
'I bought a car just now. The wheels seem to have some problems.'

(173) Gangcai you yi xie xuesheng jinlai le.
Just-now exist one Cl student come-in SFP.

Xianzai xuesheng (dou) zuoxia le.
Now student all sit-down SFP

'Just now some student came in. Now the students (all) sat down.'

The examples above show that bare nouns in Mandarin can behave like definite plurals in English, in addition to behaving like English bare plurals (as we saw in Section 2.5.1). The proposed Situation Restriction can be viewed as an analogous to the iota operator and can be used to account for the cases in (171) to (173).

Although the present analysis of definite bare nouns in Mandarin differs from the one proposed by Li (2011) and Li and Bisang (2012), this view is compatible with theirs given that the notion of ‘maximality’ is related to ‘identifiability’. In order to refer to the maximal sum of individuals in a situation, these individuals should be identifiable first.

Before I end my discussions on Mandarin bare nouns, I would like to address one last issue, namely the use of Mandarin bare nouns with demonstratives. I will show in the

48 Regarding how to account for the phenomenon in English in (1) to (3), I refer the readers to the discussions in Condoravdi (1997) and Dayal (2013).
following section that the proposed analysis of Situation Restriction on bare nouns in (164) has important consequences for demonstratives.

2.5.4 Bare nouns with demonstratives

As we saw in Section 2.3.3, demonstratives in Mandarin can combine with numeral classifier phrases (c.f. (92a)). It has been widely observed in the literature that demonstratives can combine directly with bare nouns in Mandarin (Chao 1968; Tang 1990, 2007; A. Li 1999; Cheng and Sybesma 1999, 2014; Yang 2001, Wang 2005; H. Yang 2005; X. Li 2011, 2013, among others), as illustrated below.

(174) a. zhe shu shi xie gei niang-er-men-er kan de.
   this book is write give women-folk read De
   ‘This book was written for womenfolk to read.’ (Chao 1968: 510)

b. zhe/na ren
   this/that person
   ‘this/that person’ (A. Li 1999: 96, fn 25)

c. na chezhan hen yuan.
   that station very far
   ‘That station is very far.’ / Not: ‘Those stations are very far.’
   (from Academia Sinica Balanced Corpus of Modern Chinese 2004)
   (H. Yang 2005: 65)

As far as I am aware, the above pattern in Mandarin is representative of classifier languages generally. The need for a classifier to mediate between a noun and a demonstrative has been previously noted for Burmese-Yipho languages in general (Xu 2001: 205), Cantonese (Matthews and Yip 2011: 107), Wu (X. Li 2011: 6, fn 3), Southern Min (Tang 2007: 980) and Nuosu Yi, which I will discuss in Chapter 4 (Section 4.6).

The demonstrative-noun phrase [Dem NP] in Mandarin differs from genuine definites semantically. Recall the test from Löbner (1985) that differentiates genuine definite determiner from demonstratives, as we saw in Section 2.4.1:

(175) a. # The child is loud and the child is not loud. (Löbner 1985: 285)

b. That boy is sleeping and that boy is not sleeping.

In (175a), the genuine definites, i.e. the noun phrases with an definite determiner, yield a contradiction when appearing with a predicate and its negation (175a); in contrast, in (175b), the noun phrases with a demonstrative admit a sensible interpretation (175b). Mandarin [Dem NP] phrases behave semantically on a par with [Dem NP] phrases in English as well as those in other languages that freely allow bare nouns as arguments as examined in Dayal (2004). Look at the example in (176a), when appearing with a predicate and its negation, the demonstrative-noun phrases admit a sensible interpretation, whereas in (176) the bare nouns with a definite interpretation yield a contradiction when appearing with a predicate and its negation.
(176) a. na nanhai zai shuijiao, na nanhai mei zai shuijiao.  
that boy PROG sleep that boy not PROG sleep  
'That boy is sleep and that boy is not sleeping.'

a. # nanhai zai shuijiao, nanhai mei zai shuijiao.  
boy PROG sleep boy not PROG sleep  
'The boy is sleep and the boy is not sleeping.'

Regarding the syntactic status of demonstratives in Mandarin, I adopted in Section 2.4.1 the view that demonstratives and article determiners do not occupy the same structural position in D that demonstratives occur in specifier positions. Such a view is based on the syntactic and semantic differences between demonstratives and article determiners, as argued by many authors (Löbner 1985; Giusti 1997, 2002; Brugé 2000, 2002; Brugé & Giusti 1996; Panagiotidis 2000; Grohmann and Panagiotidis 2004; Shlonsky 2004; Alexiadou et al 2007, among others) (cf. (111)-(115), Section 2.4.1). Under this view, demonstratives are phrasal and can merge with either higher nominal phrases like numeral classifier phrases (177a) or with lower nominal phrases like bare nouns (177b).

(177) a.                      CIP                          b.       NP
  Dem  CIP                   CIP   Cl'                   NP  ren
  zhe  Num                   yi     ge                     ren  'man'
'this' 'one' 'man'

As for the semantics of demonstratives, I adopt the view that demonstratives are property seeking functions with an indexical specification, as in Kaplan (1989), Wolter (2006) and Dayal (2012) (cf. Section 2.4.1). Under the analysis of bare nouns as kinds in Mandarin, I propose that demonstratives, in addition to being obtained from properties, can also be obtained via kinds via the help of indexically individuated situations. Specifically, I propose that the same strategy to derive definites from kinds via Situation Restriction (164), plus an indexical component, can be exploited to obtain the definite reading for [Dem NP] in Mandarin. For example, if the child-kind c is a function from situations s to the maximal entity that instantiates the child-kind in s, zhe haizi ‘this child’ in (176) can be represented as "haizi(thereₙ)", where thereₙ denotes the (distal) situation the speaker is pointing at (178c).

(178) a. wo xihuan zhe haizi, bu xihuan zhe haizi.  
I like this child not like this child  
'I like this child but don’t like this child.'

b. [[haizi]] = eᵏ<sub>children</sub>  
c. [[zhe haizi]] = haizi(thereₙ) = eᵏ<sub>children</sub>s(thereₙ)  

That is to say, unlike definite determiners which universally combine with properties and return entities of type <<e, t>, e>, demonstratives can be a function contextually restricted
by an indication of the speaker; this function picks a salient individual that the speaker is pointing at, type \(<e, t>, e> (179a)\), or demonstratives can be a function from kinds to individual entities of type \(<e, e>\), restricting kinds to the situation that the speaker is pointing at, type \(<e^k, e> (179b)\).

(179) Demonstratives: type \(<e, t>, e> or \(<e^k,e>\).
   a. \(f_{DEM}^{<e,t>,e}(P)|^{c,w,i,g} = g(f)(|P|)\)
      if \(g(C) = C (Dem): contextually restricted by an indication of the speaker\)
   b. \(k_{[s-DEM]}^{<e^k, e>}|^c\): restricting kinds to the situation (s) that the speaker is pointing

To summarize Section 2.5, I have shown that the other interpretations of Mandarin bare nouns can be derived from their kind interpretation within a Neocarlsonian account of bare nominals, as pursued in Yang (2001) and X. Li (2011, 2013). I proposed an alternative approach to derive the definite interpretation from the kind interpretation via Situation Restriction. I showed that the proposed account for the definite interpretation of Mandarin bare nouns can also account for the demonstrative-noun phrase in Mandarin.

As we will see later in Chapter 5, this Neocarlsonian account of bare nominals discussed in this section can be further extended to bare nominals in other classifier languages like Nuosu Yi as well. In the following section, I will discuss the last type of bare nominal arguments in Mandarin, i.e. the bare classifier-noun phrase. I will show that the proposed analysis of bare numeral classifier phrases in Mandarin as shown in Section 2.4 also has important implications for the bare classifier-noun phrase.

2.6 Mandarin is not so bare: one-deletion of numeral classifier phrases

In addition to bare nouns and bare numeral classifier phrases, Mandarin allows another type of nominal arguments which consists only of a classifier and a noun but no numeral [Cl N] (Lü 1944; Chao 1968; Paris 1981; A. Li 1997; Cheng and Sybesma 1999; Borer 2005; J. Huang 2009, 2014; Cheng et al 2012; Li and Bisang 2012; Zhang 2013; Jiang 2014, 2015; Li and Feng 2015, among others). Numerals-less classifier phrases, which is also referred to as bare classifier phrases (i.e. bare ClPs) in the literature, receive an interpretation similar to [one Cl NP], as illustrated below.

(180) a. er nian qian ta fumu gei ta qu le (yi) ge xifu.
      two year ago he parent give he marry ASP one Cl wife
      ‘Two years ago, his parents helped him to marry a wife.’
   b. wo shi (yi) ge hen wangu de ren.
      I be one CL very stubborn MOD man
      ‘I am a very stubborn man.’ (Lü 1944: 168)

As early as in Lü (1944), it was convincingly argued that the Mandarin [Cl N] expression is the result of deleting the numeral one from the numeral classifier phrase [one Cl N] (see also Chao 1968: 554; A. Li 1997; Borer 2005; J. Huang 2009, 2014; Jiang 2015; Li and Feng 2015). Besides the one-deletion view, there is another view which argues against a relationship between [Cl N] and [one Cl N]. The view opposed to one-deletion
claims that [Cl N] receives only a nonspecific interpretation, and therefore cannot be treated as the deletion of one in [one Cl N] as the latter can receive specific interpretation in addition to the nonspecific one (Cheng and Sybesma 1999; Cheng et al. 2012; Li and Bisang 2012; Zhang 2013).

In this section, I am going to defend the one-deletion view of the bare classifier phrase in Mandarin and argue that the bare classifier phrase is not really bare in the syntax; instead, it has the structure [one Cl N]. Specifically, I will argue for the following four points: (i) Mandarin [Cl N] can appear in environments that require specific interpretations (Section 2.6.1), (ii) Mandarin [Cl N] behaves like [one Cl N] and indefinites in general in allowing long-distance scope interpretations (Section 2.6.2), (iii) the arguments against the one-deletion analysis of Mandarin bare ClPs (e.g. Cheng and Sybesma 1999; Cheng et al. 2012; Li and Bisang 2012) do not hold (Section 2.6.3), and (iv) the one-deletion analysis not only captures the syntactic and semantic behaviors of Mandarin bare classifier phrases but also logically accounts for why [Cl N] can only be interpreted as singular instead of ‘two’, ‘three’, or ‘some’ (Section 2.6.4). Let us start with the interpretation and distribution of Mandarin [Cl N].

2.6.1 Interpretation and distribution of [Cl N]

Regarding the interpretation of numeral-less classifier phrases [Cl N] in Mandarin, it is widely accepted that they usually receives a prominent nonspecific indefinite interpretation (e.g. see Lü 1944; Chao 1968; A. Li 1997; Cheng and Sybesma 1999; Chen 2004; J. Huang 2009, 2014, Li and Bisang 2012, among many others), as exemplified below.

(181) a. Men-qian you ge ren.
   door-front have Cl people
   ‘There is someone outside the door.’ (Cheng and Sybesma 1999: 525)

b. Gangkuan qu zhao (yi) ge ren lai, shenme ren dou xing.
   Hurriedly go find one Cl person come any person all fine
   ‘Hurry up and get somebody; anybody will be just fine.’ (Chen 2004: 1160)

Numeral-less classifier phrases, however, can also receive a specific indefinite interpretation, and such a interpretation can emerge easily in constructions that require specific interpretations (e.g. see Lü 1944; Chen 2004; J. Huang 2009, 2014; Jiang 2012, 2015). I illustrate this point with two tests for specificity in Mandarin.

The first test for specificity comes from Lü (1944), Sybesma (1992, 1999), and Chen (2004), who illustrate that Mandarin ba-construction requires the nominals which follow ba to be interpreted as either definite or specific. Lü (1944: 161), Chen (2004) and J. Huang (2014) have demonstrated that [Cl N] in Mandarin can appear in ba-construction and can be interpreted as specific. I provide two of their examples in (182).
(182) [Cl N] in ba-construction

a. *(ta) re-de shangsi bu xihuan, ba ge guan* nong-diao le.
   3sg annoy boss not like Ba Cl job (of an official) make-lose SFP
   'He annoyed his boss and lost a job.  
   (Lü 1944: 161)

b. *ta ba ge (hao) pengyou gei dezui le.*
   3sg Ba Cl good friend give offend Perf/FP
   'He got a (good) friend offended.'  
   (J. Huang 2014:35)

In addition to the above examples observed by Lü (1944), Chen (2004) and J. Huang (2014), examples of this sort can be widely seen in daily life as well as in literary work. Below I provide some of the examples found in Beijing Language and Culture University DCC Corpus (BLCU Corpus in short) (see Gou et al 2016 for an introduction to this corpus):

(183) [Cl N] in ba-construction

a. *shuo zhe shuo zhe, da bai bizi ye ba ge haizi an zai* talk PROG talk PROG, big white nose also Ba Cl child press at ling qian. memorial-tablet front.
   Lit: 'While he was talking, the big-white-nose also pushed one child against the front of the memorial tablet.'
   (from Lao She Niu Tianci Zhuan [Biography of Niu Tianci])

b. *ta lao yezi bi zhe ta nian shu, shengsheng de ba ge haizi bi chu bing lai le.*
   3sg old man force PROG 3sg read book, alive MOD ba Cl child force occur illness come SFP
   Lit: 'His father was forcing him to study; [that] directly made a child become sick.'  
   (from CAO Xueqin Honglong Meng [Dream of the Red Chamber])

c. *renda de che shizai lao-jiu le yi dian. suoyi wo he Zou shuji* Renda MOD car truly old Asp a bit hence I and Zou secretary ye jiu jueding haishi ba liang che jiao gei renda. also then decided still Ba Cl car give to Renda.
   Lit: 'The cars in Renda (National Peoples's Congress) are somewhat too old; therefore Secretary Zou and I decided to give a car to Renda.'  
   (from RUI Gen Nongchao [Surf Waves])

d. *zhe fan jieshao, zhi ba ge guniang xiu de* this Cl introduction, directly Ba Cl girl shy RESULT fen lien-er cheng le kuai da hong bu. pink face become Asp Cl big red cloth
   Lit: 'This introduction immediately made one girl so shy that her pink face turned red, like a piece of big red cloth.'
   (from CAO Ruobing Yushan Shenjian [Jade Fan and Magical Sword])
e. *ji tian gongfu, ba ge haizi gao de jiu bu xiang ge haizi yang le.
Just within a couple of days; [it] made a child not look like a child.'
(from GAO Yubao Gao Yubao)

f. dou shi ni-men he jiu he de hao,
all be 2pl drink alcohol drink MOD good,
ba ge ren he cheng zhe yang.
Ba Cl person drink become this looks
Lit: 'It is all because you drank so happily that [you] made one person drunk
like this.'
(from GAO Yong Yanzhi Baodao [Rouge Sword])
(BLCU DCC Corpus)

In all examples above, the [Cl N] phrase appears in the ba-construction and needs to be interpreted as specific rather than nonspecific.

Another test for specificity comes from J. Huang (1987), who showed that Mandarin bare nouns cannot appear in the secondary predication sentences as in (184a), but the numeral classifier phrases [one Cl N] can (184b). This test shows that bare nouns behave differently than numeral indefinites that they do not allow a specific interpretation.

     I teach-EXP student very intelligent
     b. Wo jiao-guo yi-ge xuesheng hen congming.
     I teach-EXP one-Cl student very intelligent
     ‘I once taught a student who was very intelligent.’ (J. Huang 1987: 248)

The [Cl N] expression can appear in the secondary predication sentence which behaves like [one Cl N] rather than bare nouns (Jiang 2012, 2015), as exemplified in (185).

(185)  [Cl N] in secondary predication sentences
   a. wo kan le (yi) ben shu te you-yisi
     I read ASP one Cl book rather interesting
     'I read a book which is very interesting.'
   b. ta jiao le (yi) ge nüpengyou hen piaoliang.
     he make ASP one Cl girlfriend very pretty
     ‘He got a girlfriend who is very pretty.’ (Jiang 2015: 336)

In (185), the numeral ‘one’ yi can be omitted, and both [one Cl N] and [Cl N] receive a specific indefinite interpretation.

Similarly, examples of this sort can be widely seen in daily life as well as in literary work. I provide some of the examples found in the BLCU Corpus below.
(186) [Cl N] in secondary predication sentences

a. ni ruo chi le ge jidan hen meiwei, you hebi qu kan sheng dan de muji.  
you if eat ASP Cl egg very delicious you why go look lay egg MOD hen  
Lit: 'If you eat a egg that is very delicious, [I see no reason] why you should go  
to look for the hen that laid the egg.' (from Weibo)

b. ta jia le ge laogong hen hei, hei-qiqi de na zhong hei.  
she marry ASP Cl husband, very black black-paint MOD that type black  
Lit: 'She married a husband who is very dark, as dark as black paint.'  
(from Weibo)

c. jintian kan le chang dianying hen haokan.  
today watch ASP Cl movie very interesting  
Lit: 'Today [I] watched a movie which is very interesting.' (from Weibo)

d. zuijin zuo le ge meng ting kongbu de.  
recently make ASP Cl dream quite scary de  
Lit: 'Recently [I] dreamed a dream which is quite scary.' (from Weibo)

e. Haiping jiang le ge xiaohua ting youyisi.  
Haiping tell ASP Cl joke quite interesting  
Lit: 'Haiping told a joke which is quite interesting.' (from Weibo)

f. zhe laotou zha le ge bangshou hen lihai.  
this old-man find ASP Cl helper very incredible  
Lit: 'This old man found a helper who is very incredible.'  
(from Shengyan Minghuo Chaoji jianxiu [Superb sword practitioners] )

g. na nüde jiao Fan Zaoni, shi zanme cun zhishu de nüer,  
that woman call Fan Zaoni, be our village clerk MOD daughter  
zha le ge duixiang hen bucuo, jushuo shi shiwei xuanchuan-bu  
find ASP Cl partner very good it-is-said be Shiwei publicity-department  
de fu buzhang.  
mod vice minister  
Lit: 'That woman is called Fan Zaoni; [she] is the daughter of our village clerk;  
[she] has a partner who is pretty good; it is said that [the partner] is the vice  
minister of the publicity department in Shiwei (Municipal Party Committee)  
(from Xiao Nongmin Hunshi xiao nongmin [The greatest young farmers])  
(BLCU DCC Corpus)

What the above examples showed to us is that the numeral-less classifier phrase [Cl N]  
can appear in the environments that require a specific interpretation and that the  
numeral-less classifier phrases in these examples have to be interpreted as specific  
indefinite.

Although the numeral-less classifier phrase [Cl N] and the numeral classifier  
phrase [one Cl N] share the nonspecific and specific indefinite interpretations, they do  
differ in one respect: the former cannot express the meaning which emphasizes the  
umeral information of one, as first observed in Lü (1944: 166-167) and further discussed  
in Li and Bisang (2012). In particular, Lü (1944: 166-167) observes that when the  
umeral information is addressed in a sentence, yi ‘one’ cannot be omitted. He examines  
and describes a series of contexts where yi ‘one’ can never be omitted. I generalize and
summarize some of them as the following: (i) in sentences with negation meaning similar to ‘not a single’ (187i); (ii) in sentences when ‘one’ is focused (187ii); (iii) in dou-sentences which emphasizes ‘the whole’ (187iii); (iv) in sentences with contrastive focus (187iv).

(187) \([\text{Cl N}]\) cannot express the meaning which emphasizes the numeral information

i. sentences with negation meaning ‘not a single’

\[
\text{ta zai zher mei you *(yi) ge ren-shi de ren}
\]

he at here not have one Cl know De man

‘He does not know a single person here’

ii. sentences in which ‘one’ is focused

\[
\text{jiaoshi li zhi you *(you) ge ren}
\]

classroom inside only have one Cl man

‘There is only one person in the classroom.’

iii. dou-sentences meaning ‘the whole’

\[
\text{ta ba *(yi) pan rou dou chi le.}
\]

he Ba one plate meat Dou/all eat ASP

literally: ‘He ate one plate of meat, all (meat on the plate).’

‘He finished the whole plate of meat.’

iv. sentences with contrastive focus

\[
\text{wo mai le *(yi) ben zazhi he wu ben shu.}
\]

I buy ASP one Cl magazine and five Cl book

‘I bought one magazine and five book.’

Li and Bisang (2012) provide additional examples to illustrate that if the numeral information in a sentence is important and emphasized, it will prevent \([\text{Cl N}]\) from appearing in the sentence without one. Their examples are given in (188).

(188) a. \(\text{wo hua le *(yi) ge xiaoshi chifan}
\]

‘I spent one hour eating meal.’

b. \(\text{wo zai xianggang dai le *(yi) ge vue}
\]

‘I stayed for one month in Hong Kong.’ (Li and Bisang 2012: 345)

Next, let us look at the distribution of \([\text{Cl N}]\). As we saw in Section 2.3.1 (c.f. (56)), Mandarin \([\text{Cl N}]\) phrases only appear in extremely restricted positions. It has been observed in the literature that they are banned in sentence initial position (e.g. Lü 1944; Chao 1968: 554; Cheng and Sybesma 1999; Li and Bisang 2012) (189a), but they are also disallowed quite generally in the second position of a sentence (189b). In order to make both sentences in (189) grammatical, the numeral one has to be used (190).
(189) a. *ge xuesheng yinggai yao haohao xuexi.  [generic sentence]
   Cl student should need good study
b. (waimian) *zhi gou zai jiao
   outside, Cl dog PROG bark

(190) a. yi ge xuesheng yinggai yao haohao xuexi.
   one Cl student should need good study
   ‘A student should study hard.’
b. (waimian) yi zhi gou zai jiao
   outside, one Cl dog PROG bark
   ‘Outside, a dog is barking.’

In addition, [Cl N] never appears in a topic position or the position after topic but before
the verb, as observed in Li and Bisang (2012).

(191) a. *ge pingguo ah, wo yijin chi le.
   Cl apple TOP I already eat SFP
b. A: Where is the book ?
   B. *na ben shu, ge xuesheng mai zou le.
      that Cl book Cl student buy away SFP
      Intended: ‘That book, a student bought it.’ (Li and Bisang 2012: 338)

In post-verbal positions, [Cl N] is allowed and many examples have already been given
to that effect (e.g. (181), (182), (185)). However, it cannot freely occur in the postverbal
position, as we have seen in Section 2.3.1. Lü (1944: 170-171) examines and describes a
series of contexts where [Cl N] is disallowed in the postverbal position. One of these
contexts, which always holds, can be characterized along the following lines: [Cl N] can
never occur in coordination structures after the first conjunct in a listing situation where
there are multiple nominals (see also Yang 2001: 69). We have already seen examples of
this sort in (56b) (as repeated in (192)); I provide one more example from Yang (2001) in
(193).

(192) *wo mai le zhi mao, tiao gou he zhi tuzi.
   I buy ASP Cl cat, Cl dog and Cl rabbit
   Intended: ‘I bought a/the cat, a/the dog and an/the rabbit.’

(193) Yuehan mai le (yi) ben shu he *(yi) zhi bi.
   John buy ASP one Cl book and one Cl pen
   ‘John bought a book and a pen.’ (Yang 2001: 69)

Interestingly, [Cl N] seems to be incompatible with certain word preceding it, such as guo,
an aspect marker:
If we replace the aspect marker guo to the aspect marker le, the numeral-less classifier phrase [Cl N] will be allowed in the above examples in (194).

In this section, we saw that the numeral-less classifier phrase [Cl N] shares the interpretations with the numeral classifier phrase [one Cl N]: [Cl N] can receive a nonspecific indefinite interpretation; it can appear in the environments that require a specific interpretation. However, [Cl N] does differ from [one Cl N] in that it cannot express the meaning which emphasizes the numeral information of one. In terms of its distribution, [Cl N] is extremely restricted in Mandarin. [Cl N] is banned in the sentence initial position as well as the second position of a sentence. [Cl N] is allowed in the postverbal position; however, even in the postverbal position, it is not freely allowed. In particular, in the postverbal position, [Cl N] is banned in coordination structures after the first conjunct in a listing situation where there are multiple nominals; it is also banned in the position following certain elements such the aspect guo. The following section discusses the scope behavior of Mandarin [Cl N]; as we will see, Mandarin [Cl N], just like indefinites, can receive a long distance scope interpretation and exhibit the island escaping ability.

### 2.6.2 Scope behaviors of [Cl N]

Mandarin [Cl N] phrases exhibit the same island escaping ability as indefinites like [one Cl N] and can receive the same long-distance scope interpretation. In (195), yi ge xuesheng ‘one-Cl-student’ and ge xuesheng ‘Cl-student’ are the internal arguments of the predicate in the adjunct clause. Both of them can have a wide scope interpretation escaping from the adjunct if-clause in addition to the narrow scope interpretation.

(195) a. [ruguo ni neng dai yi ge xuesheng lai wo-de party de-hua],
    if you can bring one Cl student come my party if
    ni he duoshao wo dou mai-dan
    you drink much I All pay-bill
    ‘If you can bring one student to my party, no matter how much you drink I will pay for it.’

[one Cl N] > if or if > [one Cl N]
b. [ruguo ni neng dai ge xuesheng lai wo-de party de-hua],
   if you can bring Cl student come my party if
   ni he duoshao wo dou mai-dan
   you drink much I All pay-bill
   ‘If you can bring one student to my party, no matter how much you drink I will
   pay for it.’ [Cl N] > if) or if > [Cl N]

Under the wide scope reading, (yi) ge xuesheng ‘(one) Cl student’ is interpreted as a
specific student, and the speaker will pay for the hearer’s drink if the hearer brings that
specific student to the party. In contrast, under the narrow scope reading, (yi) ge xuesheng
‘one Cl student’ is interpreted as nonspecific, and the hearer’s drink will be paid as long
as he/she can bring a student (any one) to the party.

Admittedly, the prominent interpretation of the [Cl N] phrase is the narrow scope
non-specific reading; however the wide scope specific reading is still available. This
reading becomes prominent when either the verb dai ‘bring’ or the noun xuesheng
‘student’ is stressed or when the sentence is produced with raising intonation.

As we saw in Section 2.3.2, numeral classifier phrases can take wide scope over a
scope-bearing element. Two examples are repeated below.

(196) a. da-bufen youke dou bei yi ge xiaohai-er
     most vistor all PASSIVE one Cl kid
     huyou mai le (yi) bu shouji.
     hoodwink buy ASP one Cl cell-phone
     Lit: ‘Most visitors were hoodwinked to buy a cell phone by a kid.’
     [one Cl kid] > most or most > [one Cl kid]

b. mei ge xuesheng dou bei yi ge pianzi pian le liang-qian kuai.
     every Cl student all PASSIVE one Cl swindler con ASP two-hundred Yuan
     Lit: ‘Every student got conned out of two thousands Yuan by a swindler.’
     [one Cl swindler] > every or every > [one Cl swindler]

The same as numeral classifier phrases, [Cl N] in Mandarin can also take wide scope over
the quantifier most or every, receiving a specific interpretation: a specific kid in (197a)
and a specific swindler in (197b).

(197) a. dabufen youke dou bei ge xiaohai-er
     most vistor all PASSIVE Cl kid
     huyou mai le (yi) bu shouji.
     hoodwink buy ASP one Cl cell-phone
     Lit: ‘Every visitor was hoodwinked to buy a cell phone by a little girl.’
     [Cl kid] > most or most > [Cl kid]
b. *mei* ge xuesheng dou bei *ge* pianzi pian le liang-qian kuai.
   every Cl student all PASSIVE Cl swindler con ASP two-hundred yuan
   ‘Every student got conned out of two thousands Yuan by a swindler.’
   
   [Cl swindler] > every or every > [Cl swinder]

In addition, bare ClPs in Mandarin can escape islands without having the widest scope, similar to (numeral) indefinites. In the following examples in (198), [Cl N] can receive an intermediate scope interpretation, behaving like numeral indefinites in (66) and (67) (some examples are repeated in (199)).

(198)

a. *dabufen* laoshi dou anwei le [mei **vi** **ge**
   most teacher DOU console ASP every one Cl
   [bei **ge** pianzi pian le qian] de xuesheng]
   PASSIVE Cl swindler con ASP money MOD student
   Lit: ‘Most teachers consoled every student who was conned out of money by a swindler’
   
   (i) Intermediate scope: [most teacher > [Cl swindler] > every student]
   (ii) Narrow scope: [most teacher > every student > [Cl swindler]]

b. *dabufen* mianshiguan dou zancheng taotai [mei **vi** **ge**
   most interviewee dou agree eliminate every one Cl
   [bei **ge** xiaoxue ti-mu NANDAO (le)] de yingzheng-zhe]
   PASSIVE Cl elementary-school question baffle ASP MOD applicant
   Lit: ‘Most interviewees agreed to eliminate every applicant who was baffled by one elementary school assessment question.’
   
   (i) Intermediate scope: most interviewee > [Cl question] > every applicant
   (ii) Narrow scope: most interviewee > every applicant > [Cl question]

c. *mei* ge laoshi dou anwei le [mei **vi** **ge**
   every Cl teacher DOU console ASP every one Cl
   [bei **ge** xiao-hunhun xia ku le] de haizi]
   PASSIVE Cl young-gangster threaten cry ASP MOD kid
   Lit: ‘Every teacher consoled every student who was threatened to cry by a young gangster.’
   
   (i) Intermediate scope: every teacher > [Cl young gangster] > every student
   (ii) Narrow scope: every teacher > every student > [Cl young gangster]

(199)

a. *dabufen* laoshi dou anwei le [mei **vi** **ge**
   most teacher DOU console ASP every one Cl
   [bei vi **ge** pianzi pian le qian] de xuesheng]
   PASSIVE one Cl swindler con ASP money MOD student
   Lit: ‘Most teachers consoled every student who was conned out of money by a swindler’
   
   (i) Intermediate scope: [most teacher >one swindler> every student]
   (ii) Narrow scope: [most teacher > every student > one swindler]
b. dabufen mianshiguan dou zancheng taotai [mei yi ge
most interviewee dou agree eliminate every one Cl
[bei yi ge xiaoxue ti-mu nandao (le)] de yingzheng-zhe]
PASSIVE one Cl elementary-school question baffle ASP MOD applicant
Lit: ‘Most interviewees agreed to eliminate every applicant who was baffled by
one elementary school assessment question.’
(i) Intermediate scope: most interviewee > one question > every applicant
(ii) Narrow scope: most interviewee > every applicant > one question
c. mei ge laoshi dou anwei le [mei yi ge
every Cl teacher DOU console ASP every one Cl
[bei yi ge xiao-hunhun xia ku le ] de haizi]
PASSIVE one Cl young-gangster threaten cry ASP MOD kid
Lit: ‘Every teacher consoled every student who was threatened to cry by a
young gangster.’
(i) Intermediate scope: every teacher > one young gangster > every student
(ii) Narrow scope: every teacher > every student > one young gangster

Having seen the interpretation, distribution and scope behavior of the numeral-classifier
phrases in Mandarin, let us move on to the previous analyses of them.

2.6.3. Previous analyses of Mandarin numeral-less classifier phrases

Two main views have been proposed for Mandarin [Cl N] which are quite opposite in
nature. One treats [Cl N] as one-deletion from [one Cl N] (e.g. Lü 1944; Chao 1968; A.
Li 1997; Borer 2005; J. Huang 2009, 2014; Jiang 2012, 2015; Li and Feng 2015 among
others), the other argues against one-deletion analysis and treats [Cl N] as an independent
phrase with no relation to [one Cl N] (e.g. Cheng and Sybesma 1999; Cheng et al 2012;
Li and Bisang 2012; Zhang 2013). The main reason that the opponent of the one-deletion
analysis claims the one-deletion analysis is wrong is that they think [Cl N] can only be
interpreted as nonspecific indefinite in Mandarin while [one Cl N] can be either specific
or nonspecific.

In this section, I am going to review Cheng and Sybesma (1999) and Li and
Bisang (2012) and show the following points: (i) their arguments against the one-deletion
analysis of Mandarin [Cl N] do not hold; (ii) the facts that Mandarin [Cl N] phrases
behave like [one Cl N] in their ability to appear in environments that that require specific
interpretations and their ability to receive a long-distance scope interpretation (c.f.
Section 2.6.1 and Section 2.6.2) cannot be explained by the analyses in Cheng and
Sybesma (1999) and Li and Bisang (2012), and (iii) the one-deletion analysis logically
explains why [Cl N] can only be interpreted as singular but rather ‘two’, ‘three’, or
‘some’.

2.6.3.1 Cheng and Sybesma (1999) against one-deletion: Empty Num Analysis
Cheng and Sybesma (1999) analyze Mandarin [Cl N] and Cantonese [Cl N] in a similar way and claim that both of them cannot be viewed as the phonological deletion of [one Cl N] to simply [Cl N]. Their main reason of believing the one-deletion analysis is wrong is the following:

(200) "[Cl + N] phrases and [yi-Cl + N] phrases have a different distribution. Indefinite [Cl + N] phrases in Cantonese can be interpreted as indefinite nonspecific only. On the other hand, [yi-Cl + N] phrases can be interpreted as specific and nonspecific indefinites." (Cheng and Sybesma 1999: 525)

Based on the interpretation of Cantonese [Cl N], Cheng and Sybesma (1999) predict that the interpretation of Mandarin [Cl N] is also nonspecific only; in particular they predict that ‘in contexts where only an indefinite specific interpretation is possible, Mandarin [Cl N] phrases should not be able to surface’ (Cheng and Sybesma 1999: 525). They provide two tests to argue that [Cl N] in Mandarin cannot be specific.

Before reviewing their tests, I would like point out some problem with the main reason why they believe the one-deletion view of Mandarin [Cl N] is wrong, i.e., it is illegitimate to make predictions about the interpretation of Mandarin [Cl N] based on that of Cantonese or to assume that Mandarin [Cl N] should be interpreted like Cantonese [Cl N]. Cheng and Sybesma (1999) have shown that Cantonese [Cl NP] and Mandarin [Cl NP] differ not only in their semantic interpretations but also in syntactic distributions. In particular, the Cantonese [Cl N] can receive a definite reading in addition to the indefinite reading and can freely appear in argument positions. On the other hand, Mandarin [Cl N] can never receive a definite interpretation and cannot appear in preverbal positions but only in extremely limited positions. Given these differences, there is no good reason to assume the interpretation of [Cl N] in Mandarin is the same as that in Cantonese.

Returning to their test, the first one involves bounded predicates. As argued by Sybesma (1992:176–178), bounded predicates, such as resultative predicates and the ba-construction, force either a definite or a specific interpretation of the object. They provide several examples to illustrate that [Cl N] cannot appear with bounded predicates. Coincidentally, they also use the same ba-construction as in Lü 1944, but observe a single case disallowing [Cl N] (202i). Besides the ba-construction, they use resultative predicates to illustrate that they are also incompatible with [Cl N], as given in (201ii). Based on the contrasts they have observed, they conclude that the ‘[Cl N] phrase must be nonspecific and that there is no phonological reason why ‘one’ could not be suppressed’ (Cheng and Sybesma 1999: 525-526).

(201) First test: ‘bounded predicates’
   i. ba-construction
      Wo ba *yi-wan_tang he-wan-le.
      I BA one-bowl soup drink-finish-LE
      ‘I finished a (particular) bowl of soup.’
ii. resultative predicates
   a. Wo chi-wan-le *(yi)-kuai bingan.
      I eat-finish-LE one-CL cookie
      ‘I finished a cookie.’
   b. Wo he-wan-le *(yi)-wan tang.
      I drink-finish-LE one-bowl soup
      ‘I finished a bowl of soup.’     (Cheng and Sybesma 1999: 525-526)

There are two main problems with the examples they provide and the conclusion they draw from them.

First, there is no direct logical relation between the unacceptability of [Cl N] in the examples in (201) and the conclusion that [Cl N] must be nonspecific.

Second, the argument Cheng and Sybesma provide faces vast counterexamples observed in the literature and widely seen in literary work. As we saw in Section 2.6.1, as early as in Lü (1944: 160-161), it has been observed that Mandarin [Cl N] can appear in the ba-construction, receiving a specific interpretation (see also Chen 2004; J. Huang 2009, 2014). I repeat some of their examples below.

(202) [Cl N] in ba-construction
   a. (ta) re-de shangsi bu xihuan, ba ge guan
      3sg annoy boss not like Ba Cl job (of an official) make-lose SFP
      'He annoyed his boss and lost a job.'     (Lü 1944: 161)
   b. ta ba ge (hao) pengyou gei dezui le.
      3sg Ba Cl good friend give offend Perf/FP
      'He got a (good) friend offended.'     (J. Huang 2014:35)

In addition to the above examples observed by Lü (1944), Chen (2004) and J. Huang (2014), I provided further examples of this sort widely seen in daily life and literary work in (183) (as repeated in (203)).

(203) [Cl N] in ba-construction
   a. shuo zhe shuo zhe, da bai bizi ye ba ge haizi an zai
      talk PROG talk PROG, big white nose also Ba Cl child press at
      ling qian.
      memorial-tablet front.
      Lit: 'While he was talking, the big-white-nose also pushed one child against the 
      front of the memorial tablet.'
      (from Lao She Niu Tianci Zhuan [Biography of Niu Tianci])

49 Indeed, Lü (1944: 160-161) and Chen (2004) have illustrated that Mandarin [Cl N] can receive a specific indefinite interpretation under various circumstances besides the ba-construction.
b. *ta lao yezi bi* zhe *ta nian shu,* shengsheng de
   3sg old man force PROG 3sg read book, alive MOD
   *ba ge haizi bi chu bing lai le.*
   Ba Cl child force occur illness come SFP
   Lit: 'His father was forcing him to study; [that] directly made a child, become sick.' (from CAO Xueqin Honglong Meng [Dream of the Red Chamber])

c. *renda de che shizai lao-jiu le yi dian. suoyi wo he zou shuji*
   Renda MOD car truly old Asp a bit hence I and Zou secretary
   ye *jiu jueding haishi ba liang che jiao gei renda.*
   also then decided still Ba Cl car give to Renda.
   Lit: 'The cars in Renda (National Peoples's Congress) are somewhat too old; therefore Secretary Zou and I decided to give a car to Renda.' (from RUI Gen Nongchao [Surf Waves])

d. *zhe fan jieshao, zhi ba ge guniang xiu de*
   this Cl introduction, directly Ba Cl girl shy RESULT
   fen tian-er cheng le kuai da hong bu.
   pink face become Asp Cl big red cloth
   Lit: 'This introduction immediately made one girl so shy that her pink face turned red, like a piece of big red cloth.'
   (from CAO Ruobing Yushan Shenjian [Jade Fan and Magical Sword])

e. *ji tian gongfu, ba ge haizi gao de jiu bu xiang ge haizi yang le*
   several day time Ba Cl child make RESULT then not like Cl child looks SFP
   'Just within a couple of days; [it] made a child not look like a child.'
   (from GAO Yubao Gao Yubao)

f. *dou shi ni-men he jiu he de hao,*
   all be 2pl drink alcohol drink MOD good,
   *ba ge ren he-cheng zhe yang.*
   Ba Cl person drink-become this looks
   Lit: 'It is all because you drank so happily that [you] made one person drunk like this.' (from GAO Yong Yanzhi Baodao [Rouge Sword])
   (from BLCU DCC Corpus)

The above examples in (202) and (203) have shown that the numeral-less classifier phrase [Cl N] in Mandarin can appear in the environment that requires a specific interpretation; such a fact have to be acknowledged.50

Their resultative predicate test in (201ii) also encounters counterexamples easily found in daily conversation as well as in newspaper reports. I provide some of the examples found in the BLCU Corpus below.

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50 Regarding why the examples with [Cl N] appearing in the *ba*-construction in (202i) are marked as unaccepteable in Cheng and Sybesma (1999) (indeed they are acceptable to me as well as my informants), I will leave it for further research.
Numeral Classifier Phrases and Bare Nouns in Mandarin

(204) [CI N] with resultative predicates

a. yi  quan  da-si  le  ge  ren.
   one punch beat-die ASP CI man
   Lit: '[I] beat a man to death by a punch.'
   (from SHI Nai'an Shuihu Zhuan [Water Margin])

b. ganggang  chi-wan  le  ge  Yuebing.
   just-now eat-finish ASP CI moon-cake
   Lit: 'just now [I] finished a moon cake.'
   (from Weibo)

c. weile Haidi  de  na-xie yinhua,
   for Haidi MOD those oil-painting
   Zuoliang  you  bian-cheng  le  ge  mujiang.
   Zuoliang again change-become ASP CI carpenter
   Lit: 'Because of Haidi's oil painting, Zuoliang became a carpenter again.'
   (from Xiamen Business News)

d. Tiandi Yijiachun  de  pangbian,  wa-hao  le  ge  keng.
   Tiandi Yijiachun MOD side dig-well ASP CI hole
   Lit: 'By the side of Tiandi Yijiachun, [someone] digged a hole.'
   (from LIU Degui Jiaqing Huangdi [Jiaqing Emperor])

e. ta yijing  zai  zheli  wa-hao  le  ge  xianjin  deng  wo  tiao  xiaqu.
   he already at here dig-well ASP CI trap wait me jump down
   Lit: 'He has already set a trap, waiting for me to jump in.'
   (from GU Long Bi Yu Dao [Jasper Sword])

f. Xiaoyu'er  mosuo  zhe,  shi-qi  le  jian  dongxi.
   Xiaoyu'er search PROG pick-up ASP CI thing
   Lit: 'Xiaoyu'er was searching and then picking up a thing.'
   (from GU Long Juedai Shuangjiao [Handsome Siblings])

g. qishi  zao  xiang-hao  le  ge  jieju.
   indeed early think-well ASP CI ending
   Lit: 'Indeed [I] have already thought of an ending.'
   (from Zi Fei Yu Piaolai Dangqu [Floating and Swinging])
   (from BLCU DCC Corpus)

Turning to their second test, Cheng and Sybesma (1999) also use secondary predication from J. Huang (1987) (c.f. (184), Section 2.6.1) and provide two examples where [CI N] is unacceptable with secondary predication.

(205) Second test: secondary predication

a. Wo jiao-guo  *(yi)-ge  xuesheng  hen  congming.
   I teach-EXP one-Cl student very intelligent
   'I once taught a student who was very intelligent.'

b. Ta xie-guo  *(yi)-ben  shu  hen  you-yisi.
   he write-EXP one-Cl book very interesting
   'He once wrote a book which was very interesting.'
   (Cheng and Sybesma 1999: 526)
There are two issues with regard to this test. First, examples in which [Cl N] appears with secondary predication are widely seen in daily conversation as well as in literary work, as we have seen in (185) and (186) (as repeated in (206) and (207)).

(206) [Cl N] in secondary predication sentences

a. *wo kan le (yi) ben shu te you-yisi*
   
   I read ASP one Cl book rather interesting
   
   'I read a book which is very interesting.'

b. *ta jiao le (yi) ge nüpengyou hen piaoliang.*
   
   he make ASP one Cl girlfriend very pretty
   
   'He got a girlfriend who is very pretty.'   (Jiang 2015: 336)

(207) [Cl N] in secondary predication sentences

a. *ni ruo chi le ge jidan hen meiwei, you hebi qu kan sheng dan de muji.*
   
   you if eat ASP Cl egg very delicious you why go lay egg MOD hen
   
   Lit: 'If you eat an egg that is very delicious, [I see no reason] why you should go to look for the hen that laid the egg.'   (from Weibo)

b. *ta jia le ge laogong hen hei, hei-qiqi de na zhong hei.*
   
   she marry ASP Cl husband, very black black-paint MOD that type black
   
   Lit: 'She married a husband who is very dark, as dark as black paint.'   (from Weibo)

c. *jintian kan le chang dianying hen haokan.*
   
   today watch ASP Cl movie very interesting
   
   Lit: 'Today [I] watched a movie which is very interesting.'   (from Weibo)

d. *zuijin zuo le ge meng ting kongbu de.*
   
   recently make ASP Cl dream quite scary de
   
   Lit: 'Recently [I] dreamed a dream which is quite scary.'   (from Weibo)

e. *Haiping jiang le ge xiaohua ting youyisi.*
   
   Haiping tell ASP Cl joke quite interesting
   
   Lit: 'Haiping told a joke which is quite interesting.'   (from Weibo)

f. *zhe laotou zhao le ge bangshou hen lihai.*
   
   this old-man find ASP Cl helper very incredible
   
   Lit: 'This old man found a helper who is very incredible.'   (from Shengyan Minghuo Chaoji jianxiu [Superb sword practitioners] )

g. *na nude jiao Fan Zaoni, shi zanme cun zhishu de nu'er,*
   
   that woman call Fan Zaoni, be our village clerk MOD daughter
   
   zhao le ge duixiang hen bucuo, jushuo shi shiwei xuanchuan-bu
   
   find ASP Cl partner very good it-is-said be Shiwei publicity-department de fu buzhang.
   
   mod vice minister
   
   Lit: 'That woman is called Fan Zaoni; [she] is the daughter of our village clerk; [she] has a partner who is pretty good; it is said that [the partner] is the vice minister of the publicity department in Shiwei (Municipal Party Committee)
   
   (from Xiao Nongmin Hunshi xiao nongmin [The greatest young farmers])

   (BLCU DCC Corpus)
Second, the two unacceptable cases in (205) both contain *guo*, an aspect marker, immediately preceding [Cl N]; such a morpheme seems to reject [Cl NP] regardless whether a sentence contains a secondary predication or not, as illustrated below.

(208) a. *Wo jiao _guo_ ge xuesheng.
   I teach ASP Cl student

   b. */??Ta xie _guo_ ben shu.
   he write ASP Cl book

In contrast, all the grammatical sentences in (206) and (207) contain another aspect marker *le* which does not cause a problem when it occur with [Cl N] and a secondary predication. The contrast between (205) and (206)/(207) perhaps suggests a phonological condition for one-deletion, as I will discuss in Section 2.6.4.

Although Cheng and Sybesma disagree with the one-deletion analysis of Mandarin [Cl N], they propose a structure in which there is a null numeral projection NumP above ClP for Mandarin numeral-less classifier phrases, as illustrated below.

(209)

```
<table>
<thead>
<tr>
<th>NumP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numeral</td>
</tr>
<tr>
<td>ClP</td>
</tr>
<tr>
<td>Cl</td>
</tr>
<tr>
<td>NP</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>
```

(Cheng and Sybesma 1999: 529)

According to Cheng and Sybesma, the empty head needs to be lexically governed; thus accounting for the distribution of Mandarin [Cl N]. However, to posit a null numeral for [Cl N] predicts that a numeral, i.e., *yi* ‘one’, can be recovered in [Num Cl N], and this indeed echoes the one-deletion analysis of [Cl N] which views that there is an omitted numeral *yi* ‘one’ in [Cl N] (c.f. Li and Bisang 2012: 347).

In the next subsection, I consider arguments and tests from Li and Bisang (2012) and show that their arguments and tests also do not succeed in supporting their claim that [Cl N] in Mandarin can only be nonspecific and that [Cl N] cannot be treated as deleting *one* from [one Cl N].

### 2.6.3.2 Li and Bisang (2012) against one-deletion: VP Internal Existential Quantification Analysis

Li and Bisang (2012) use a set of tests to argue for three points:

(210) a. Indefinite [Cl N] in Mandarin is only non-specific but never specific;
    b. [Cl N] do not have a quantity reading (as in Li’s 1997 term, c.f. Section 2.3.3);
    c. [one Cl N] has three-way ambiguity: a quantity, specific and nonspecific reading.
Based on their tests they reach the following conclusion: given that indefinite [Cl N] is only nonspecific, but [one Cl N] is three-way ambiguous, [Cl N] cannot be the result of one-deletion from [one Cl N].

The last two points in (210b/c) that Li and Bisang (2012) argued have also been illustrated in Lü (1944), and we have seen some of the examples in (187) (c.f. Section 2.6.1), so no review of that is necessary. On the other hand, their first point in (210a) and the conclusion that they reached are flawed, so this section reviews arguments and tests Li and Bisang have provided for (210a) and the reasoning behind their conclusion.

Li and Bisang (2012: 345-346) use three tests to support their claim that [Cl N] can only be nonspecific: (i) modification by a relative clause, (ii) creation verbs, and (iii) modification by a secondary predicate.51 Their third test is the same as Cheng and Sybesma's (1999) second test in (205), as we just saw in Section 2.6.3.1, and I have shown many examples in which [Cl N] is compatible with a secondary predicate in (206) and (207), so this test will be excluded from the current discussion.

Let us look at their first test; Li and Bisang (2012) use the fact bare ClPs cannot serve as the head of a relative clause (RC in short) to argue that they do not have a specific interpretation. Zhang (2006) has argued that when the RC precedes and modifies the numeral classifier phrase, the whole [RC Num Cl N] phrase is only specific; she claims that the different word order of the RC and the [NumP-Cl] with regard to the head noun corresponds to different interpretations. Specifically, according to Zhang, the [RC Num Cl N] phrase only receives a specific interpretation, but the [Num Cl RC N] phrase can either receive a specific or a nonspecific interpretation. Li and Bisang (2012) adopt Zhang’s claim as a criterion. They show that when [one Cl N] is modified by a RC, the modified phrase [RC [Cl N]] is grammatical and receives a specific interpretation only (211a), but [Cl N] cannot be modified by the RC—the sentence containing [RC [Cl N]] is ungrammatical (211b).

(211)  a. wo zai zhao [[RC xue yingyu de] yi ge xuesheng].
    I PROG seek learn English MOD one Cl student
    ‘I am looking for a student who learns English. [specific]

     b. * wo xiang zhao [[RC xue yingyu de] ge xuesheng].
    I want seek study English MOD Cl student
    (Li and Bisang 2012: 346, ex (20a), (21a))

Li and Bisang (2012: 346) use the ungrammaticality of (211b) to illustrate that the [Cl N] in Mandarin does not express specificity.

Li and Bisang contrast (211) with (212). In (212a), the [one [Cl [RC N]]] phrase can receive either specific or non-specific; in (212b), the sentence containing [Cl [RC N]] is acceptable. According to Li and Bisang (2012: 346), the reason why (212b) is

51Li and Bisang (2012:339) treat ba-construction with [Cl N] as marginal because they find that no consensus among their informants regarding the grammaticality of ba-sentences with [Cl N]. Nevertheless, as we have seen in (182) and in (183), examples in which [Cl N] appears in ba-construction are widely accepted by various scholars and are also easily found in daily life and literary work. These examples have to be acknowledged and cannot be simply treated as marginal as Li and Bisang (2012).
acceptable is because ‘the noun in [Cl N] is modified by the RC so that the whole phrase has a nonspecific reading’.

\[(212)\]   
\begin{enumerate}
\item \textit{a.} \textit{wo zai zhao \{yi ge \[\{RC xue yingyu de\] xuesheng\].}  
\textit{I PROG seek one CI learn English MOD student} 
\textit{‘I want to look for a student who learns English.’ [Specific] or [Non-specific]}  
\item \textit{b.} \textit{wo xiang zhao \{ge \[\{RC xue yingyu de\] xuesheng\].}  
\textit{I want seek CI learn English MOD student} 
\textit{‘I want to look for a student who learns English.’} [Non-specific]  
\end{enumerate}  
(Li and Bisang 2012: 346)

Li and Bisang’s first test and their reasoning are problematic for three main reasons.

First, the acceptability of [Cl [RC N]] in (212b) does not support their claim that [Cl N] can only be nonspecific and never be specific. In particular, [Cl [RC N]] can appear in environments that force a specific indefinite interpretation, such as ba-sentences (e.g. Lü 1944; Sybesma 1992, 1999; Chen 2004) and sentences with resulative predicates (see Sybesma 1992: 176-178). Some some of the examples found in the BLCU Corpus are given below.

\[(213)\]  
\begin{enumerate}
\item \textit{[Cl [RC N]] in ba-constructions}  
\textit{a.} \textit{Ma Yunlong ba \{ge \[ershi-duo sui, kanlai shifen jiling de\] xiao huozii]  
Ma Yunlong Ba CI twenty-more year look very clever MOD young man jiao dao yan qian.}  
\textit{call to eye front} 
\textit{Lit: 'Ma Yunlong asked a young man who is twenty-some years old and looks clever to come in front of him.'}  
\textit{(from LIU Canyang \textit{Tiejiao xifu} [Iron foot wife]}  
\item \textit{b.} \textit{zhe sheng da he, jiu zuyi ba \{ge \[bu hui wugong de\] ren\]  
this Clsound loud scold already sufficient Ba CI not able Kung-fu MOD person zhen de liang er chang ming.}  
\textit{shock RESULT two ear continuous ring} 
\textit{Lit: 'This loud scold is already sufficient to shock a person who is not able to play Kung fu and to make his ears ring continuously.'}  
\textit{(by Wo Longsheng \textit{Wuming Xiao} [Nameless flute]}  
\item \textit{c.} \textit{cheng-li lai le yi ge shen yi Yu Jieqing, jushuo yishu ru shen,}  
\textit{city-inside come ASP one CI divine doctor Yi Jieqing, it-is-said skill like God yixia jiu ba \{ge \[hun shui shi-duo tian de\] bingren\} yi hao.}  
\textit{a-short-while then Ba CI lethargic sleep ten-more day MOD patient cure well} 
\textit{Lit: 'A divine doctor Yu Jieqing came to the city; it was said that [he] is skillful like God and that [he] cured in a short while a patient who slept lethargically for ten more days.'}  
\textit{(by QIN Hong \textit{Jiulong Deng} [Jiulong lantern]})
\end{enumerate}
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d. ni zenme jiu gan si zuo zhuzhang, ba [ge [yao jin men de] ren] you how even dare private make decision MOD man ji chu le jia men. squeeze out ASP home door
Lit: 'How dare you make the decision secretly and push a person who was about to go in out the door.' (by LIN Xi Xiao-de Er) (from BLCU BCC Corpus)

(214) [Cl [RC N]] in secondary predication sentences
Anxi bing-men jian Xu Shiji yi chushou, jiu she-si le [ge /shenchuan] Anxi soldier-pl see Xu Shiji once hit then shoot-dead ASP Cl wear yinse kuijia de Baiji dajiang. silver armor MOD Baiji general Lit: 'Once Anxi soldiers saw Xu Shiji started to hit, they shoot a Baiji general who wore silver armor to death.' (from LI Xiaoming Sui-Tang yingxiong fangming pu [List of Heros of Sui and Tang Dynasties]) (from BLCU DCC Corpus)

The above examples in (213) and (214) illustrate that the [Cl [RC N]] phrase can receive a specific indefinite interpretation, contrary to what Li and Bisang's claim that such a phrase only receives a nonspecific interpretation.

Second, when we place a scope-bearing element above [Cl [RC N]], [Cl [RC N]] behaves like indefinites and can receive not only a narrow scope interpretation but also a wide scope interpretation (215).

(215) mei ge xuesheng dou bei ge xiang xue zhongwen de laowai every Cl student all PASSIVE Cl want learn Chinese MOD foreigner yao le dianhua haoma ask ASP phone number ‘Every student was asked by a foreigner who wanted to lean Chinese for their phone numbers.’
(i) a foreigner> every student or (ii) every student> a foreigner

When [Cl [RC N]] takes a wide scope in (215i), it receive a specific interpretatin, namely 'a specific foreigner who wanted to learn Chinese'.

Third, the unacceptability of [RC [Cl N]] in the sentence in (211b) does not support Li and Bisang's conclusion that [Cl N] does not express specificity. The ungrammaticality of (211b) could arise for various reasons. For example, if the head nouns in (211) are raised from within the relative clause, we would expect that they can be reconstructed back into the relative clause; however reconstructing [Cl N] back into the RC is unacceptable (216b), which contrasts with (216a). This suggests that the sentence in (211b) is ungrammatical to begin with and that its ungrammaticality is not related to the interpretation of [Cl N].
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(216) a. *yi ge xuesheng xue yingyu.
   one CL student learn English
   ‘a student studying English.’

b. *ge xuesheng xue yingyu.
   CL student learn English

Turning to Li and Bisang’s second test; they use creation verbs to show that these verbs accept both [Cl N] and [one Cl N] and that these two phrases only receive a non-specific interpretation with these verbs (217).

(217) a. wo kao le yi ge dangao.
   I bake PFV one CL cake

b. wo kao le ge dangao.
   I bake PFV CL cake

Both: ‘I baked a cake.’   (Li and Bisang 2012: 346)

This above two sentences in (217) can only illustrate the point that Mandarin [Cl N], the same as [one Cl N], can receive a nonspecific interpretation; however it cannot support the claim that Mandarin [Cl N] can only receive a nonspecific interpretation.

Li and Bisang further show that [Cl N] and [one Cl N] differ in whether they can express addressed numeral information; I showed in Section 2.6.1 that Lü (1944), who argues for the one-deletion view of [Cl N], also reaches such a conclusion, and examples have been provided to illustrate this point in (187). Importantly, such a difference between [Cl N] and [one Cl N] alone does not present an argument against the one-deletion analysis of [Cl N].

Regarding the analysis of Mandarin [Cl N], Li and Bisang propose that the classifier phrase ClP is the maximal projection of the indefinite [Cl N] with no higher projection above it, as shown below.

(218) ClP
    Cl NP
        N

They propose that indefinite [Cl N] denotes a set of atomic entities, i.e. set of singularities based on the assumption that bare nouns denote kinds (e.g. Chierchia 1998b). They argue that classifiers in [Cl N] apply to a kind term in the denotation of NP and return a subset of atomic individuals, i.e. at type of <k, <e, t>>. Their analysis of the semantics of individual classifiers is given in (219a), with the bare CLP ben shu ‘Cl book’ analyzed in the (218c) (INST stands for the instantiation operation).
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(219) a. Classifier =λkλx. INST (x, k) ∧ ATOM(x)  
   b. ǀǀshuǀǀ =BOOK  
   c. ǀǀben shuǀǀ =λx.INST (x, BOOK)∧ATOM_{Volume}(x)  

(Li and Bisang 2012: 347)

Based on the semantics of [Cl N] in (219c), the bare ClP is interpreted as a predicative nominal phrase of type <e, t>. Li and Bisang assume that indefinite [Cl N] introduces variables that have to be bound by the Heim’s (1982) type of existential quantifier. Consequently, if [Cl N] falls into a postverbal position, the existential quantifier comes in by default existential quantification over the VP (see Diesing 1992), thus accounting for the indefinite interpretation of [Cl N] in postverbal positions.

Li and Bisang’s analysis of bare ClPs in Mandarin is similar to Tsai’s (1999, 2001) Extended Mapping Hypothesis for numeral classifier phrases in Mandarin (see Section 2.3.4). However, there are two main problems with their analysis. First, Li and Bisang's analysis expects [Cl N] to be acceptable in postverbal position; however, as we have seen in Section 2.6.1, [Cl N] cannot freely occur in postverbal position in Mandarin. In particular, it cannot occur in coordination structures after the first conjunct in a listing situation where there are multiple nominals (e.g. Lü 1944; Yang 2001), as we saw in (192) and (193) (as repeated in (220) and (221). [Cl N] is also incompatible with certain word preceding it, such as the aspect guo, as we saw in (193) (as repeated in (222).

(220) *wo mai le zhi mao, tiao gou he zhi tuzi.  
I buy ASP Cl cat, Cl dog and Cl rabbit  
Intended: ‘I bought a/the cat, a/the dog and an/the rabbit.’

(221) Yuehan mai le (yi) ben shu he *(yi) zhi bi.  
John buy ASP one Cl book and one Cl pen  
‘John bought a book and a pen.’ (Yang 2001: 69)

(222) a. Yuehan mai guo *(yi) ben shu.  
John buy ASP one Cl farmer  
‘John bought a book.’

b. wo kan guo *(yi) bu dianying.  
I watch ASP one Cl movie  
‘I (have) watched a movie.’

c. wo kan guo *(yi) ge guizi.  
I watch ASP one Cl carbinet  
‘I bought a carbinet.’

Second, Li and Bisang's analysis based on the local existential quantifier cannot account for the long-distance scope behaviors of Mandarin [Cl N] as we saw in Section 2.6.2. Some examples are repeated below.
(223) a. [ruguo ni neng dai ge xuesheng lai wo-de party de-hua],
    if you can bring Cl student come my party if
    ni he duoshao wo dou mai-dan
    you drink much I All pay-bill
    ‘If you can bring one student to my party, no matter how much you drink I will
    pay for it.’ [Cl N] > if] or if > [Cl N]

b. dabufen youke dou bei ge xiaohai-er
    most visitor all PASSIVE Cl kid
    huyou mai le (yi) bu shouji.
    hoodwink buy ASP one Cl cell-phone
    Lit: ‘Every visitor was hoodwinked to buy a cell phone by a little girl.’
    [Cl kid] > most or most > [Cl kid]

c. dabufen laoshi dou anwei le [mei yi ge
    most teacher DOU console ASP every one Cl
    [bei ge pinazi pian le qian] de xuesheng]
    PASSIVE Cl swindler con ASP money MOD student
    Lit: ‘Most teachers consoled every student who was conned out of money by a
    swindler’
    (i) Intermediate scope: [most teacher > [Cl swindler]> every student]
    (ii) Narrow scope: [most teacher > every student > [Cl swindler]]

To summarize Section 2.6.3, I reviewed the arguments and tests from Cheng and
Sybesma (1999) and Li and Bisang (2012) against the one-deletion approach to Mandarin
[Cl N] and showed that their arguments and tests do not support their claim that [Cl N] in
Mandarin only receives a non-specific interpretation nor the claim that [Cl N] cannot be
interpreted as deleting one from [one Cl N]. In particular, we saw many examples from
previous literature and corpora which demonstrate that bare classifier phrases, [Cl N] as
well as [Cl [RC N]], can appear in environments that require a specific indefinite
interpretation, such as ba-construction, sentences with resultative predicates, and
sentences with secondary predicates.

In the following section, I will show that the one-deletion analysis of Mandarin
bare classifier phrases, as first argued in Lü (1944), not only can capture their syntactic
and semantic properties that we have seen, but also it can logically account for why [Cl
N] in Mandarin can only be interpreted as singular, instead of ‘two’, ‘three’, or ‘some’.

2.6.4. One-deletion analysis of Mandarin [Cl N]

The previous sections showed us that Mandarin numeral-less classifier phrases [Cl N]
and the numeral classifier phrase [one Cl N] share high similarities regarding their
interpretations and scope behaviors. These similarities between [Cl N] and [one Cl N]
lead us to the one-deletion analysis of Mandarin bare classifier phrases as first proposed
in Lü (1944) and further elaborated by many others (e.g. Chao 1968; A. Li 1997; Borer
CIPs in Mandarin are not really bare in the syntax; instead they have the structure of the
numeral classifier phrase \([one \ Cl \ N]\), and it is the process of eliding the numeral \(one\) at PF that leads to the surface bare form of \([Cl \ N]\), as illustrated below.

\[
(224) \quad \text{Structure of Mandarin } [Cl \ N]: \ [one \ Cl \ N] \text{ in the syntax}
\]

- a. Syntax
  \[
  \begin{array}{c}
  \text{CIP} \\
  \text{NumP} \\
  yi \\
  'one'
  \end{array} \rightarrow \begin{array}{c}
  \text{Cl} \\
  \text{NP}
  \end{array}
  \]
- b. PF
  \[
  [yi \ Cl \ N]
  \]

Let us first look how the one-deletion analysis accounts for the similarities between \([one \ Cl \ N]\) and the \([Cl \ N]\) in Mandarin.

In Section 2.4, I showed that the proposed lexical view of numerals allows us to derive a general quantifier (GQ) variant of numeral classifier phrases. The quantificational force could be gained via a global existential closure (Heim 1982), a covert existential quantifier (Link 1983, 1987, Krifka 1999), a type-shifting principle, (Partee 1986, Landman 2003), or simply via the proposed lexical analysis of choice function. Based on the analysis of numeral classifier phrases developed in Section 2.4, a possible theory of specificity that captures \([one \ Cl \ N]\) and its relation with the bare CIP can be the following one.

We can view that it is the GQ reading that leads to the nonspecific interpretation of \([one \ Cl \ N]\) and that it is the choice function in the lexical entry of the numeral \(yi\) ‘one’ that contributes to its specific/weak presuppositional interpretation, allowing long-distance scope interpretations. Accordingly, the nonspecific and the specific interpretation of the numeral classifier phrase \([one \ Cl \ N]\) can be characterized in the way illustrated in (225).

\[
(225) \quad \text{Nonspecific and specific interpretation of } [one \ Cl \ N]
\]

- a. \([one \ Cl \ N]\) (nonspecific reading via GQ)
  \[
  = \lambda Q \exists y \exists X [X \subseteq AT(\`k) \land |X| = 1 \land y = \cup X \land Q(y)] \quad \text{GQ} \rightarrow \text{nonspecific}
  \]

- b. \([one \ Cl \ N]\) (specific/weak presuppositional reading via choice function)
  \[
  = f_3(\lambda x[one(\text{AT}(\`k))(x)])
  \]

Concerning the interpretation of bare CIPs in Mandarin, they uncontroversially receive the nonspecific interpretation, i.e. the GQ reading in (225a), and the interpretational issue of bare CIPs is whether the specific reading in (225b) is available after eliding \(one\). Previous sections show that Mandarin bare CIPs do allow the specific interpretation, so bare CIPs is the same as \([one \ Cl \ N]\) in terms of specificity. Accordingly, we can view that it is the elided \(one\) that contributes to the nonspecific reading as well as the specific reading of bare CIPs, as shown below.

\[
(226) \quad \text{Interpretations of Mandarin bare CIPs:}
\]

- a. \([one \ Cl \ N]\) (elided \(one\) leading to nonspecific reading)
  \[
  = \lambda Q \exists y \exists X [X \subseteq AT(\`k) \land |X| = 1 \land y = \cup X \land Q(y)]
  \]

130
b. \([\text{one Cl N}]\) (elided one leading to specific/weak presuppositional reading)
   \[= f_3(\lambda x[\text{one} (\text{AT} (\text{\-'k})(x))]\)

Next, let us consider the differences between the bare CIP and \([\text{one Cl N}]\). As shown in Section 2.6.1, the difference between the bare CIP and \([\text{one Cl N}]\) has to do with their distribution ((189) - (194), as summarized in (227)) as well as whether they can be used in a clause where the numeral ‘one’ information is important and stressed (187)/(188), as summarized in (228).

(227) Distributional differences between [Cl N] and [one Cl N]
   i. [Cl N] can appear in the position immediately following the verbal element
      a. \(\text{zhe laotou zhao le ge bangshou hen lihai.}\)
         this old-man find ASP Cl helper very incredible
         Lit: ‘This old man found a helper who is very incredible.’
      b. \((\text{ta})\) re-de shangsi bu xihuan, ba ge guan
         3sg annoy boss not like Ba Cl job (of an official) make-lose SFP
         ‘He annoyed his boss and lost a job.’
   ii. [Cl N] cannot appear in postverbal positions in a listing situation
      a. *wo mai le zhi mao, tiao gou zhi tuzi.
         I buy ASP Cl cat, Cl dog and Cl rabbit
         Intended: ‘I bought a/the cat, a/the dog and a/an rabbit.’
   iii. [Cl N] cannot appear in the sentence initial position or preverbal position
      a. *(yi) ge xuesheng yinggai yao haohao xuexi.
         one Cl student should need good study
         ‘A student should study hard.’
      b. (waimian,) *(yi) zhi gou zai jiao
         outside, one Cl dog PROG bark
         ‘Outside, a dog is barking.’
      c. *ge pingguo ah, wo yijin chi le.
         Cl apple TOP I already eat SFP
   iv. [Cl N] cannot co-occur with certain aspect marker
      a. Yuehan mai guo *(yi) ben shu.
         John buy ASP one Cl farmer
         ‘John bought a book.’
      b. wo kan guo *(yi) bu dianying.
         I watch ASP one Cl movie
         ‘I (have) watched a movie.’

(228) [Cl N] cannot express the meaning that emphasizes the numeral information
   i. sentences with negation meaning ‘not a single’
   \(\text{ta zai zher mei you *(yi) ge ren-shi de ren}\)
      he at here not have one Cl know De man
      ‘He does not know a single person here’
ii. sentences in which ‘one’ is focused

\[\text{jiaoshi li zhi you *(you) ge ren}\]

‘There is only one person in the classroom.’

iii. dou-sentences meaning ‘the whole’

\[\text{ta ba *(yi) pan rou dou chi le.}\]

He Ba one plate meat Dou/all eat ASP

literally: ‘He ate one plate of meat, all (meat on the plate).’

‘He finished the whole plate of meat.’

iv. sentences with contrastive focus

\[\text{wo mai le *(yi) ben zazhi he wu ben shu.}\]

I buy ASP one Cl magazine and five Cl book

‘I bought one magazine and five book.’

v. sentences that deliver the number information.

\[\text{wo hua le *(yi) ge xiaoshi chifan}\]

I spend ASP one Cl hour eat-meal

‘I spent one hour eating meal.’

To account for the distributional difference between bare ClPs and [one Cl N], two possible answers can be provided. One is that the restricted distribution of bare ClPs is the result of syntactic restrictions, e.g. government, as proposed in Cheng and Sybesma (1999) and J. Huang (2009). The other is that the distributional restriction is due to phonological/prosodic restrictions, as proposed in Lü (1944) and Li and Feng (2015). In the rest of this section, I am going to briefly illustrate how the restricted distribution of bare ClPs that we have seen can be accounted for via a phonological account (I refer the reader to Li and Feng (2015) for a more detailed discussion of the phonological account for Mandarin bare ClPs).

Phonetically, Mandarin ‘one’ \textit{yi} is a syllable only consisting of a high front vowel /i/ without onset or coda. If /i/ is not stressed, it could easily be omitted in a fast speech when a stressed word precedes it. In other words, the phonetic characteristics of \textit{yi} ‘one’ in Mandarin yields the optional deletion.

Lü (1944: 174) describes a necessary phonological condition for \textit{one}-deletion: deleting \textit{yi} ‘one’ in Mandarin is possible when \textit{yi} (/i/) is unstressed (\textit{qinyin hua lightened/unstressed}) and preceded by a stressed word (\textit{zhongyin ‘heavy/stressed syllable’}). I adopt Lü’s condition and modify it slightly: deleting \textit{yi} ‘one’ in Mandarin is possible when \textit{yi} (/i/) is unstressed and when there is a stressed word closely preceding it. In addition to this condition, I conjecture that the motivation for deleting \textit{one} is to facilitate efficiency in speech, especially, in fast colloquial speech. With the conditions and the motivation for \textit{one}-deletion in mind, let me illustrate how they account for the restricted distribution of Mandarin [Cl N].

In a sentence, verbs usually bear main stress; when [one Cl N] follows a verb forming a constituent with it, a possible environment is provided to delete \textit{one}. This is exactly the case where [Cl N] occurs (e.g. (227i)). However, in the postverbal position, if [one Cl N] is separate from the stressed word by pause (i.e. in listing situation), the condition for deleting \textit{one} is not met. This accounts for why [Cl N] is disallowed in
coordination structures after the first conjunct in a listing situation (e.g. (227ii)). In sentence initial position/preverbal position, there is no word immediately preceding yi ‘one’, the condition for one-deletion is not satisfied either; thus accounting for why [Cl N] is unacceptable in (227iii). In cases where all the conditions for deleting one are met, if deleting one does not facilitate computational efficiency (i.e. make speeches efficient) but rather creates more difficulties in speech (i.e. causes pronunciation difficulties or violates phonological rules), one-deletion should not be expected to occur. This could be the reason why [Cl N] are unacceptable in sentences like the one in (227iv).

The phonological account for the distribution restrictions of bare ClPs can makes a prediction about one-deletion in Mandarin. If a stressed word, not even a verbal element, immediately precedes [one Cl N], we should expect the deletion of ‘one’ can happen. This prediction is born out. In (229), when [one Cl N] is followed by demonstratives or universal quantifiers which normally bear stress, one can be deleted. The examples below show that the deletion rule is prosodically conditioned.

(229)  
   a. zhe/na (yi) ge ren \(^{52}\)  
      this/that one Cl man  
      ‘this man/that man’  
   b. mei (yi) ge ren  
      every one Cl man  
      ‘every man’

As for the semantic difference between bare ClPs [Cl N] and [one Cl N] in Mandarin, it can be understood by placing a semantic condition for eliding one: one can be elided from [one Cl N] to derive the bare ClP when the numeral information is not stressed/important. Accordingly, in the environments in which the numeral information is stressed/focused (228), we should not expect the eliding of one to occur.

As we can see, the one-deletion analysis can derive the interpretations, distribution and scope behaviors of Mandarin bare ClPs that we saw in the previous sections. More importantly, the above one-deletion analysis also logically explains why Mandarin [Cl N] can only be interpreted as singular but rather ‘two’, ‘three’, or ‘some’: since it is yi ‘one’ that is deleted from [one Cl N], the [Cl N] phrase can only be interpreted as singular one. Below I summarize the one-deletion analysis of Mandarin bare classifier phrases.

---

\(^{52}\) Besides eliding yi ‘one’ completely, yi /i/ can be pronounced with the demonstrative zhe ‘this’ or na ‘that’, yielding the pronunciation zhei or nei.
One-deletion analysis of Mandarin bare ClPs

i. Structure of Mandarin bare ClPs = \([one \ Cl \ N]\)

a. Syntax  
\[
\text{ClP} \rightarrow [\text{one} \ Cl \ N]
\]

b. PF  
\[
\text{NumP} \rightarrow \text{ClP}
\]

\[\text{one}^{53}
\]

ii. Semantic condition for eliding one: when the numeral one information is not important/stressed

iii. Interpretations of bare ClPs: \([one \ Cl \ N] = [one \ Cl \ N]\)

a. \([one \ Cl \ N]\) (elided one leading to nonspecific reading)
\[
= \lambda Q \exists y \exists X [X \subseteq AT(\cdot^k) \land |X| = 1 \land y = \cup X \land Q(y)]
\]

b. \([one \ Cl \ N]\) (elided one leading to specific/weak presuppositional reading)
\[
= f_{\exists}(\lambda x\{one (AT(\cdot^k))(x)\})
\]

iv. The restricted distribution of bare ClPs could either be the result of syntactic restrictions, e.g. Cheng and Sybesma 1999; J. Huang 2009, 2014) or be the result of phonological/prosodic restrictions (e.g. Lü 1944; Li and Feng 2015).

### 2.7 Interpretational restrictions on sentence initial nominals

This section discusses the interpretational tendency of bare nouns in the sentence initial position and the related phenomenon regarding numeral classifier phrases, as we saw in Section 2.3.3 and Section 2.5.2. The goal is to provide a uniform account for this property of nominal arguments unique to Mandarin.

#### 2.7.1 The interpretational tendency

As we saw in Section 2.5.2, in very early work, such as Chao (1968) and Li and Thompson (1981), it has been observed that in subject positions, Mandarin bare nouns have a strong tendency to be interpreted as definite. In order to receive an existential interpretation, a sentence initial verb you ‘exist/have’ is needed. Two examples are repeated below.

(231)  
\begin{itemize}
  \item a. ke lai le.  
  guest come ASP  
  ‘The guests have come.’  
  (Chao 1968: 76)
  \item b. you ke lai le.  
  exist guest come ASP  
  ‘There are guests coming.’
\end{itemize}

\[53 \text{ We can view that the numeral one in bare ClPs is either realized in a phonomically null form (i.e. } [one_{null} \ Cl \ N]) \text{ or it is being deleted in the phonology after narrow syntax; the difference between these two does not make a difference for the purpose of our discussion.}\]
In later work, however, it has been observed that various examples do not following this tendency (e.g. J. Huang (1997); Yang (2001)). In particular, Yang (2001) observes that the existential reading of bare nouns become immediately available on preverbal bare nouns, once they occur in the context of leftperipheral locatives (as seen in (148) and repeated in (232)).

(232)  
\[ \text{waimian gou zai jiao} \]  
\[ \text{outside dog PROG bark} \]  
\[ \text{i. ‘Outside, dogs are barking.’} \]  
\[ \text{ii. ‘Outside, the dog(s) are/is barking.’} \]  
\[(\text{Yang 2001: 32)}\]  

The behavior of Mandarin bare nouns is analogous to that of numeral classifier phrases in sentence-initial positions that we saw in Section 2.3.3, namely that without contexts provided it is unnatural for Mandarin indefinite numeral classifier phrases to appear in the subject position. In order to make such sentences natural, a sentence initial you ‘exist/have’ can be added or a context can be provided. Some examples are repeated below.

(233)  
\[ a. \text{Without contexts, numeral indefinites are unnatural in sentence initial position} \]  
\[ ??\text{san ge xuesheng chi le dangao} \]  
\[ \text{three Cl student eat ASP cake} \]  
\[ \text{Intended reading: ‘There are three students ate the cake.’} \]  
\[ \text{(A. Li 1997: 2)} \]  
\[ b. \text{you san ge xuesheng chile dangao} \]  
\[ \text{exist three Cl student ate cake} \]  
\[ \text{‘There were three students eating the cake.’} \]  
\[ c. \text{Context: there are three kids in the speaker’s family and the speaker refers to the three specific kids when uttering these sentences.} \]  
\[ \text{san ge haizi zai lou-shang zuo zuoye ne.} \]  
\[ \text{three Cl kid at stair-up do homework SFP} \]  
\[ \text{‘Three (specific) kids are doing homework upstairs.’} \]  

Two main puzzles arise from examples above. The first puzzle is related to how we should understand the interpretational tendency for nominals in the subject position in Mandarin (231)/(233a); the second is about how we should understand the examples that do not follow this tendency (232)/(233c).

Yang (2001) reanalyzes the tendency for nominal arguments in sentence initial positions to be interpreted as definites rather than indefinites in Mandarin with a typological account based on Li and Thompson’s (1976, 1981) categorization of Chinese as a topic-prominent language. I adopt Yang's account for the preverbal nominal arguments in Mandarin and provide some more details for such an account in the following section.

2.7.2 Towards an account
Li and Thompson (1976) in their cross-linguistic work argue that languages can be typologically categorized as topic-prominence languages and subject-prominent languages (234). They argue that Mandarin is a topic prominent language (see also Chao 1968; Xu and Liu 1997 for a similar view for Mandarin).

Subject-prominent languages and Topic-prominent languages

a. Subject-prominent languages
Indo-European
Niger-Congo
Finno-Ugric
Sinitic
Dyirbal (Australian)
Indonesian
Malagasy
...

b. Topic-prominent languages
Chinese
Lahu (Lolo-Burmese)
Lisu (Lolo-Burmese)
...

c. Subject-prominent and Topic-prominent languages
Japanese
Tagalog
Korean
Ilocano
...

(Li and Thompson (1976), summarized by Yang (2001): 42)

A key argument from Li and Thompson concerns the double subject phenomenon, which is only attested in Topic-prominent languages:

(235) a. \textsl{nei-ke shu yezi da.} (Mandarin)
that-CL tree leaf big
Lit: ‘That tree (topic), the leaves are big.’

b. \textsl{sakana-wa tai-ga oisii.} (Japanese)
fish -Top red-snapper-Nom delicious
Lit: ‘Fish (topic), red snapper is delicious.’

(Li and Thompson 1976, c.f. Yang 2001: 42-43)

Sentences of the sort in (235) have been referred to as ‘topic-comment’ structures (e.g. Li and Thompson 1976, 1981). Topics in these structures (e.g. ‘that tree’ and ‘fish’) do not have a selectional relationship with the predicate and are unlikely to derive from movement out of the comment. As for the comment, it is a full-fledged sentence containing a subject (e.g. ‘leaves’ and ‘red-snapper’). This type of sentences is not attested in Subject-prominent languages. I adopt Li and Thompson’s (1976) view and treat Mandarin as a Topic-prominent language.

Concerning what a topic is, it could be simply understood as that what is being talked about (i.e. ‘aboutness’) (Li and Thompson 1976; Chafe 1987; Lambrecht 1994, c.f. Li and Bisang 2012). With regard to what kind of nominals can serve as licit topics, I adopt the traditional view in Lambrecht (1994: 262): ‘a topic constituent must have a referent, and this referent must be identifiable and have a certain degree of pragmatic
Lambrecht (1994: 77-78) further elaborates on the idea of what an identifiable referent: ‘(it) is one for which a shared representation already exists in the speaker’s and the hearer’s mind at the time of utterance, while an unidentifiable referent is one for which a representation exists only in the speaker’s mind.’ Nominals’ references, according to Lambrecht, are arranged in a scale based on their acceptability as topic, as given in (236). (237) provides a definition of each point on the scale.

(236) Topic Acceptability Scale

<table>
<thead>
<tr>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>active</td>
<td>Most acceptable</td>
</tr>
<tr>
<td>accessible</td>
<td></td>
</tr>
<tr>
<td>unused</td>
<td></td>
</tr>
<tr>
<td>brand-new anchored</td>
<td></td>
</tr>
<tr>
<td>brand-new unanchored</td>
<td>Least acceptable</td>
</tr>
</tbody>
</table>

(Lambrecht 1994: 165, as summarized in Li and Bisang 2012: 341)

(237) a. An active referent: in a person’s focus of consciousness at a particular moment
b. An accessible referent: in a person’s background awareness and can be activated textually, situationally or inferentially.
c. An unused referent: identifiable but it is inactive in the discourse situation.
d. A brand-new anchored referent: unidentifiable for the hearer at the time the utterance is made. (the speaker links the referent to another NP that is properly contained in it.)
e. A brand-new unanchored referent: unidentifiable for the hearer at the time the utterance is made. (unanchored referent does not have no another NP to which the hearer can anchor) (Chafe 1987, as summarized in Li and Bisang 2012: 341)

Nominals with the reference in the first three scales ‘active’; ‘accessible’ and ‘unused’ are the most likely to function as a topic according to Lambrecht (1994: 262). With this understanding of topics and the assumption that Mandarin is a Topic-prominent language, let us look at the sentence initial nominals in Mandarin. For the sentence initial nominal XP, theoretically it can have one of the following syntactic representations.

(238) a. $\left[ \text{TopP} \quad \text{XP} \quad \left[ \text{IP} \quad (\text{YP}) \quad \left[ \text{VP} \quad \left[ \text{V} \quad \ldots \quad \right] \right] \right] \right]$

b. $\left[ \text{TopP} \quad \text{XP} \quad \left[ \text{IP}_i \quad \text{ti} \quad \left[ \text{VP} \quad \left[ \text{V} \quad \ldots \quad \right] \right] \right] \right]$

c. $\left[ \text{TopP} \quad \text{XP} \quad \left[ \text{VP} \quad \left[ \text{V} \quad \ldots \quad \right] \right] \right]$

In (238a), the sentence initial XP is a base-generated topic, either with or without a second nominal (YP) in the preverbal position; in (238b) the sentence initial XP is a topic moved from within the IP domain; the sentence initial XP in (238c) is not in the topic position but simply in the preverbal position.

By assuming that Mandarin is a topic-prominent language, we can exclude the possibility in (238c), so the sentence initial XP in Mandarin is either moved to the topic

---

54 I am aware of other approaches to the semantics of topicalization (e.g. Buring’s (1995, 1997) alternative semantics) but choose to adopt the traditional view of topic for reasons of simplification.
position from within the IP domain (238b) or it is simply base-generated as a topic (238a).
Furthermore, if the XP within the IP is blocked from moving to the Spec TopP position (i.e. via overt existential operator *you* ‘exist/have’ or if the Spec TopP is filled), we should expect the XP to stay within the IP domain, as illustrated in (239).

(239)  
\[ \text{a. } \left[ \text{TopP} \right. \left. \begin{array}{c} \text{XP} \\ \text{t} \\
\end{array} \text{IP} \right. \text{IP} \left. \begin{array}{c} \text{VP} \\ \text{V} \\
\end{array} \text{VP} \text{VP} \text{V} \ldots \ldots \right] \] 
\[ \text{b. } \left[ \text{TopP} \right. \left. \begin{array}{c} \text{you} \\ \text{XP} \\
\text{v} \\
\text{VP} \end{array} \text{IP} \right. \text{IP} \left. \begin{array}{c} \text{VP} \\ \text{V} \\
\text{V} \end{array} \text{VP} \text{VP} \text{V} \ldots \ldots \right] \] 
\[ \text{c. } \left[ \text{TopP} \right. \left. \begin{array}{c} \text{YP} \\ \text{XP} \\
\text{v} \\
\text{VP} \end{array} \text{IP} \right. \text{IP} \left. \begin{array}{c} \text{VP} \\ \text{V} \\
\text{V} \end{array} \text{VP} \text{VP} \text{V} \ldots \ldots \right] \] 

For the semantics of an XP in topic position as in (239), it should satisfy the identifiability requirement in (236), namely, its reference should be either ‘active’, ‘accessible’ or ‘unused.’

The next section outlines the consequences of this analysis.

2.7.2 Accounting for the interpretational tendency

I will start with numeral classifier phrases in the sentence initial position first. According to the analysis outlined in (238) and (239), the sentence initial numeral classifier phrases should always be in the Spec TopP position, either as the result of movement from within the IP domain or as the result of base-generation. However, if it is interpreted as nonspecific, which refers to any plural/singular individual not identifiable to the hearer (e.g. the sentence is uttered in an out-of-the-blue situation), we would expect this sentence to be unacceptable because it doesn’t have the characteristics of ‘topics’ and fails to satisfy the requirement of a topic as in (236). This prediction is borne out, capturing (233a), as demonstrated in (240).

(240)  
\[ \text{a. } \left[ \text{TopP} \right. \left. \begin{array}{c} \text{san ge xuesheng} \text{nonspecific} \\
\text{IP} \\
\text{v} \\
\text{VP} \end{array} \text{IP} \right. \text{IP} \left. \begin{array}{c} \text{VP} \\ \text{chi-le dan gao} \\
\text{VP} \end{array} \text{VP} \text{VP} \text{chi-le dan gao} \ldots \ldots \right] \] 
\[ \text{b. } \left[ \text{TopP} \right. \left. \begin{array}{c} \text{san ge xuesheng} \text{nonspecific} \\
\text{IP} \\
\text{v} \\
\text{VP} \end{array} \text{IP} \right. \text{IP} \left. \begin{array}{c} \text{VP} \\ \text{chi-le dan gao} \\
\text{VP} \end{array} \text{VP} \text{VP} \text{chi-le dan gao} \ldots \ldots \right] \] 

If a nonspecific numeral classifier phrase can stay within the IP domain as the result of being blocked from moving to the topic position, we should predict that such a sentence is acceptable. This again is true: in (236b), when the sentence has a sentence initial *you* serving as an existential operator, it prevents the numeral classifier phrase *san ge xuesheng* ‘three student’ from moving to the TopP domain, as illustrated in (241).

(241)  
\[ \left[ \text{TopP} \right. \left. \begin{array}{c} \text{you} \\
\text{IP} \end{array} \text{IP} \text{IP} \right. \left. \begin{array}{c} \text{san ge xuesheng} \text{nonspecific} \\
\text{v} \\
\text{VP} \end{array} \text{VP} \text{VP} \text{V} \ldots \ldots \right] \] 

If the numeral classifier phrase is identifiable to the speaker, we should expect it can appear in the sentence initial position. This is exactly what happens in (236c), namely *san*
ge haizi ‘three kids’ refers to three specific individual identifiable to the speaker. The possible structure for this example is given in (242).

(242) a. \[TopP{\text{san ge haizi}}_{\text{specific}}\] \[\text{IP} \quad [\text{VP} \quad [\text{VP} \quad \text{zai loushang zuo zuo ye}]]\]

b. \[TopP{\text{san ge haizi}}_{\text{specific}}\] \[\text{IP} \quad \text{ti}\] \[\text{IP} \quad [\text{VP} \quad [\text{VP} \quad \text{zai loushang zuo zuo ye}]]\]

Similarly, bare nouns in the sentence initial position, under the Topic-prominent analysis of Mandarin, should always stay in the Spec TopP position. Given that Mandarin bare nouns can be interpreted as definite, we should expect that bare nouns in sentence initial positions should receive a default definite interpretation. This predication is also borne out and correctly captures the interpretational tendency in Mandarin (231a) as illustrated in (243).

(243) a. \[TopP{\text{ke}}_{\text{definite}}\] \[\text{IP} \quad [\text{VP} \quad [\text{VP} \quad \text{zai loushang zuo zuo ye}]]\]

b. \[TopP{\text{ke}}_{\text{definite}}\] \[\text{IP} \quad \text{ti}\] \[\text{IP} \quad [\text{VP} \quad [\text{VP} \quad \text{zai loushang zuo zuo ye}]]\]

Likewise, if the bare noun has to stay within the IP domain because of some element that blocks it from moving into the topic domain, we should expect that the bare noun can easily an existential interpretation besides the definite reading. This again is confirmed by (231a) and (232) and illustrated in (244) and (245).

(244) \[\text{TopP} \quad \underline{\text{IP}} \quad \text{you}\] \[\text{IP} \quad [\text{ke}_{\text{existential}} \quad [\text{VP} \quad [\text{VP} \quad \text{zai chaonao le}]]]\]

(245) \[\text{TopP} \quad \underline{\text{IP}} \quad \text{waimian}\] \[\text{IP} \quad [\text{gou}_{\text{existential}} \quad [\text{VP} \quad [\text{VP} \quad \text{zai jiao}]]]\]

In (244), the bare noun ke ‘guest’ cannot moves to the sentence initial position as the movement is blocked by the sentence initial verb you ‘exist’. In (245), the movement is blocked by a locative element waimian ‘outside’ (see also Yang 2001 for the same analysis for the sentence in (245)).

Furthermore, the above analysis predicts that if the referent represented by a nominal is active (see (236)/(237), namely, a person focusing at a particular moment (e.g. via hearing or seeing), the nominal should still appear in the sentence initial position and serve as topic. This predication is also true, as supported by (147b, c) in Section 2.5.2 (as repeated in (246)).

(246) a. \[\underline{\text{yuyanxuejia}} \quad \text{you} \quad \text{zai chaonao le}.\] 


‘Linguists are quarreling again.’

b. \[\underline{\text{lang}} \quad \text{lai-le!}\] 


‘Wolves are coming!’ (J. Huang 1997: 372)
In these two examples, the speaker is the witness of the event either through seeing or hearing, the bare noun’s referent is active which ranks it highest in the scale of Topic Acceptability (236).

As we have seen, the interpretational restriction on sentence initial nominals, under the typological view of Mandarin, receives a uniform account. Furthermore, this analysis has an important implication, namely, in Mandarin both definite and specific nominals can serve as topics appearing in the sentence initial position (either through movement or base-generation).

2.8 Summary

This chapter investigated the internal domain as well as the external syntax and semantics of bare numeral containing phrases in Mandarin and compared them with those in number marking languages. It was argued that the syntax and the semantics of bare numeral containing phrases are universal. I showed that although numeral classifier phrases in Mandarin and numeral-noun phrases in number marking languages differ a great deal in their internal nominal structure, they share strong similarities at the clausal level concerning their long-distance scope behavior, semantic interpretations and syntactic distributions. Specifically, bare numeral containing phrases are systematically ambiguous (in the Universal Lexicon) between a predicate and an indefinite variant: (i) in their indefinite incarnation, they are arguments with long-distance scope properties; (ii) in their predicate incarnation, they act as restrictors of determiners, demonstratives, quantifiers and the generic operator. We saw that these two properties are stable, regardless of whether a language has (overt) D or not.

I argued for a D-less analysis of bare numeral containing phrases, in which numerals are phrasal in the syntax and are lexically ambiguous. The proposed D-less analysis captures the remarkable cross-linguistic argumental behavior of bare numeral containing phrases in a straightforward way and also accounts for their long-distance scope ability. I further argued for a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b). Regarding language variation in the nominal domain, I argued that it is primarily located in two interrelated factors: what nouns denote (kinds or properties) and what low function heads (i.e. Div and Cl) denote (a function from properties to properties or a function from kinds to properties).

The proposed analysis of numeral classifier phrases correctly predicts the scope behavior of bare nouns in Mandarin: as kind-denoting, they exhibit the narrowest scope ability like English bare nominals rather than English indefinites. The other interpretations of Mandarin bare nouns, as I showed, can be derived from their kind references. Mandarin bare nouns, therefore, also do not need to project a DP in syntax. We reached the conclusion that it is not necessary to stipulate an empty functional category D in Mandarin in order to account for the syntactic and semantic properties of nominal arguments in this language. This is arguably a simpler analysis of Mandarin nominal arguments since it avoids stipulating the presence of invisible projections that otherwise have no overt manifestation in this language. Thus, Mandarin is argued to be a classifier language without D.
The proposed analysis of Mandarin numeral classifier phrases has also allowed us to examine and account for the numeral-less classifier phrases [Cl N] in Mandarin, which have rather restricted distributions but also exhibit the same long-distance scope behavior of numeral classifier phrases. I argued that Mandarin [Cl N] is the result of phonologically deleting one from [one Cl N] and has the full structure of the numeral classifier phrase, by adopting the one-deletion view as first argued in Lü (1944). In addition, the account developed in this chapter has also helped account for the interpretational restriction on nominal arguments in the sentence initial position in Mandarin.

We shall see that the account proposed in this chapter has further implications for other types of nominal arguments in Mandarin, both with and without classifiers. I elaborate on the details in Chapter 3.
Chapter 3

Plurals and complex nominal arguments in Mandarin
—Still without D

3.1 Introduction

In Chapter 2, I developed a D-less framework for bare nominal arguments (bare numeral classifier phrases and bare nouns) in Mandarin, a classifier language without evidence of overt determiners. This chapter discusses the implications of this framework for other types of nominal arguments in this language. I focus on phrases containing -men, a morpheme that has been analyzed as a plural marker and/or a collective marker and has been used to argue for the existence of DP projections in Mandarin. Some well-known generalizations about -men include: nouns with -men (N-men) are always definite, N-men cannot occur in the position following a numeral and a classifier, and -men differs from plural markers like -s/-es in English in that it has a peculiar behavior of attaching to proper names, expressing an associative reading of “a group of people containing the person denoted by the proper name and other people related to him/her”.

The purpose of this chapter is twofold. The first goal is to add a few observations to phrases containing -men and examine a wider range of nominal structures containing this morpheme. It will be shown that -men is compatible with numerals and classifiers, contrary to the traditional claim. Such a fact will show that -men should be located local to nouns and lower than numerals as well as classifiers and that definiteness is not inherent to -men. I will further show that the property of -men being used with proper names is not unique to Mandarin and is attested in other languages as well, such as Japanese, Bangla, Hungarian and Afrikaans.

My second goal is to provide an analysis of the syntax and semantics of phrases containing -men consistent with the D-less framework of bare nominal arguments in Mandarin developed in Chapter 2. In particular, I defend the view that -men should be analyzed as a plural morpheme as first argued in A. Li (1999) but argue against the analysis of positing -men in the D position. By treating -men as a plural morpheme, the Mandarin fact may seem to argue against the uniform D-less structure of bare numeral containing phrases in Chapter 2, in which the classifier and the canonical number morphology such as -s/-es in English appear in the same functional head position (Div/Cl); however, I will argue that the Mandarin fact does not force us to change the nominal structure in Chapter 2. Specifically, I propose an analysis of -men as an associative plural marker and an associative plural projection closer to the noun and lower than the classifier, building on the split analysis of plurality (e.g. Wiltshire 2008; Kramer 2009, 2010, 2016; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014;
Mathieu and Zareikar 2015). We shall see that the proposed analysis of -men together with the D-less analysis of bare nominals in Mandarin developed in Chapter 2 account for the properties of different types of phrases containing -men in a coherently principled manner. More importantly, the proposed analysis of -men shows that we do not need to stipulate a functional category D that is invisible in Mandarin to account for nominal arguments containing -men, strengthening the D-less analysis of nominal arguments in Mandarin.

This chapter is organized as follows. Section 3.2 provides an overview of ways to express plurality in Mandarin. A review of three main views of -men will be given in Section 3.3. I argue for the view that -men is a plural morpheme but argue against the analysis of treating -men in the D position. Three types of phrases containing a numeral, a classifier, and N-men, will be discussed, which show that -men is not inherently definite and should be located local to nouns and lower than numerals and classifiers. Two further properties of phrases containing -men will be addressed in Section 3.4. I propose an analysis of -men as an associative plural marker, based on the split analysis of plurality in Section 3.5 and derive in Section 3.6 the properties of the phrases containing -men seen in Section 3.3 and Section 3.4. Section 3.7 discusses two issues regarding -men that remain in need of further explorations; Section 3.8 summarizes this chapter.

3.2 -Men and other ways to express plurality in Mandarin

As discussed in Chapter 1, one of the properties that classifier languages share is that they lack obligatory plural marking on nouns (Greenberg 1972: 17; Sanches and Slobin 1973; Aikhenvald 2000: 249). In Mandarin, this property is attested as well. Although Mandarin does not have obligatory plural marking on nouns, it does have various ways of expressing plurality (Lü 1947, 1999; Chao 1968; Li and Thompson 1981; Norman 1988; Iljic 1994; Cheng and Sybesma 1999; A. Li 1999, H. Yang 2005; Hsieh 2008; Zhang 2013).

One way to express plurality is via the morpheme -men, which can mark on pronouns and human nouns (e.g. Lü 1947, Chao 1968; Norman 1988; Iljic 1994; A. Li 1999, Lü et al 1999; Kurafuji 2004; H. Yang 2005; Hsieh 2008, among others), as demonstrated in (1) and (2). Inanimate nouns cannot take the morpheme -men, unless they are humanized (Lü 1947, Lü et al 1999: 385), as illustrated in (3) and (4).

\[
\begin{align*}
(1) & \quad a. \ wo & \quad a'. \ wo-men \\
& \quad 1-sg & \quad 1sg-MEN \\
& \quad ‘I/me’ & \quad ‘we/us’ \\
& b. \ ni & \quad b'. \ ni-men \\
& \quad 2-sg & \quad 2sg-MEN \\
& \quad ‘you (sg)’ & \quad ‘you (pl)’ \\
& c. \ ta & \quad c'. \ ta-men \\
& \quad 3-sg & \quad 3sg-MEN \\
& \quad ‘he/she/him/her’ & \quad ‘they/them’
\end{align*}
\]
Plurals and complex nominal arguments in Mandarin

(2)  a. xuesheng
student
‘the student(s)/students’
b. xuesheng-men
student-MEN
‘the students’

(3)  a. xiao-niao
little-bird
‘a/the/some bird/birds’
b. xiao-niao-men
little-bird-MEN
‘the birds’

(4)  a. pingguo
apple
‘the apple(s)/apples’
b.*pinguo-men
apple-MEN

The second way to express plurality is via the pre-nominal morpheme xie, which usually occurs with zhe/na ‘this/that’ or yi ‘one’ or (Chao 1968: 598; A. Li 1998, 1999; Lü et al. 1999: 581; Cheng and Sybesma 1999; H. Yang 2005: 65; Liao 2011: 207; Hsieh 2008: 55; Jiang 2012: 280; among others), as shown in (5) and (6).

(5)  a. na __ chezhan __ hen __ yuan.¹
that station very far
‘That station is very far.’ / Not: ‘Those stations are very far.’
(from Academia Sinica Balanced Corpus of Modern Chinese 2004)
b. na__ xie __ chezhan __ hen __ yuan.
that XIE station very far
‘Those stations are very far.’ / Not: ‘That station is very far.’
(H. Yang 2005: 65)

(6)  a. wo mai __ le __ yi __ ben __ shu.
I buy ASP one Cl book
'I bought one book'
b. wo mai __ le __ yi __ xie __ shu.
I buy ASP one XIE book
'I bought some books'

Crucially, only the numeral yi 'one' can appear with xie; numerals other than one are disallowed from occurring with it (Chao 1968: 598). An example is given in (7).

(7)  *san __ xie __ shu
three XIE book

¹ As noted in chapter 2, section 2.5.4, the demonstrative-noun phrase [Dem N] in Mandarin is marked as unacceptable in some work (e.g. Zhang 2013: 110), however, it has been observed widely in the literature that demonstratives can combine directly with bare nouns in Mandarin (see Chao 1968; Tang 1990, 2007; Li 1999; Cheng and Sybesma 1999, Yang 2001, H. Yang 2005; X. Li 2011, 2013, among others).
Regarding its semantic selection of nouns, *xie* can occur with both notional count nouns, as we saw in (5) and (6), and notional mass nouns (Chao 1968; A. Li 1999; Zhang 2013), as shown in (8).

(8)  
\[
\begin{align*}
\text{a.} & \quad \text{qing \ ni \ xian \ ba \ zhe \ xie \ shui \ yong \ guang \ zai \ qu \ na.} \\
& \quad \text{please you first BA this XIE water use up then go fetch} \\
& \quad \text{‘Please use up this water first before going for more.’} \quad \text{(A. Li 1999: 88)} \\
\text{b.} & \quad \text{na \ xie \ mianfen} \\
& \quad \text{that XIE flour} \\
& \quad \text{‘that amount of flour’} \quad \text{(Zhang 2013: 110)}
\end{align*}
\]

The third way to express plurality in Mandarin is via reduplication of classifiers, which usually occur with *yi* 'one' (e.g. see H. Yang 2005: 63; Hsieh 2008: 66; Zhang 2013: 116), as illustrated in (9). In contrast, without reduplication of classifiers, [*yi Cl N] only express singularity (10).

(9)  
\[
\begin{align*}
\text{a.} & \quad \text{jintian zaoshang \ wo \ kandao \ ta \ ba \ yi \ zhang \ zhang \ zhi \ fangdao} \\
& \quad \text{today morning I see s/he BA one Cl Cl paper put} \\
& \quad \text{shubao \ li.} \\
& \quad \text{school-bag in} \\
& \quad \text{‘This morning I saw him/her put the (individual) pieces of paper into his/her school bag.’} \quad \text{(H. Yang 2005: 63)} \\
\text{b.} & \quad \text{yi \ ge \ ge \ haizi \ tizhi \ shubao \ shangxue \ qu.} \\
& \quad \text{one Cl Cl child carry school-bag go-to-school go} \\
& \quad \text{‘The children carry school bags to school.’} \quad \text{(H. Yang 2005: 82)} \\
\text{c.} & \quad \text{he-li \ piao-zhe \ (yi) \ duo-duo \ lianhua.} \\
& \quad \text{river-in float-DUR one Cl-Cl lotus} \\
& \quad \text{‘There are many lotuses floating on the river.’} \quad \text{(Zhang 2013: 116)}
\end{align*}
\]

(10)  
\[
\begin{align*}
\text{a.} & \quad \text{yi \ zhang \ zhi} \\
& \quad \text{one Cl Cl paper} \\
& \quad \text{‘a piece of paper’} \\
\text{b.} & \quad \text{yi \ ge \ haizi} \\
& \quad \text{one Cl child} \\
& \quad \text{‘a child’} \\
\text{c.} & \quad \text{yi \ duo \ lianhua} \\
& \quad \text{one Cl lotus} \\
& \quad \text{‘one lotus’}
\end{align*}
\]

The same with *xie*, reduplication of classifiers only allows the numeral *yi* 'one' and rejects any other numerals (H. Yang 2005: 81; Hsieh 2008: 56; Zhang 2013: 285):

(11)  
\[
\begin{align*}
& \quad \text{*san \ zhang \ zhang \ zhi} \\
& \quad \text{three Cl Cl paper} \\
& \quad \text{(H. Yang 2005: 81)}
\end{align*}
\]
In addition to the above three methods, other common methods to express plurality in Mandarin include using numerals larger than *one* (12) and using quantitative expressions (13) (e.g. Chao 1968: 587; Li and Thompson 1981: 11; H. Yang 2005: 62; Hsieh 2008: 59).

(12)  
*liang ben shu*

\[\text{two Cl book} \]
\[\text{‘two books’} \]

(13)  
\[a. \ ji \ *(ben) \ shu*\]
\[\text{a few Cl book} \]
\[\text{‘a few books’} \]
\[b. \ hendo \ (ben) \ shu\]
\[\text{many Cl book} \]
\[\text{‘many books’} \]
\[b. \ xu \ (ben) \ shu\]
\[\text{many Cl book} \]
\[\text{‘many books’} \]
\[c. \ haoduo \ (ben) \ shu\]
\[\text{a-good-many Cl book} \]
\[\text{‘many books’} \]

In this chapter, I focus on the first way to express plurality in Mandarin, i.e. via *-men*, and examine four types of phrases containing it. As for the other methods of expressing plurality, I refer the readers to H. Yang (2005), Hsieh (2008), Jiang (2012), Zhang (2013) for detailed discussion and the most recent references.

### 3.3 Previous analyses of *-men* and challenges

#### 3.3.1 Background of *-men* and previous analyses

Three types of views of *-men* have been proposed in the literature. The first one regards *-men* as both a plural morpheme and a collective marker (Chao 1968, Norman 1988; Cheung 2003; Hsieh 2008). According to this view, whether *-men* is a plural morpheme or a collective marker depends on whether *-men* is attached to common nouns or pronouns/proper names.\(^2\)

The second view treats *-men* as a collective marker (Iljic 1994). Iljic (1994) considers three reasons to favor the analysis of *-men* as a collective marker and to argue against the plural analysis. One, *-men* marked nouns are always definite (Rygaloff 1973, Yorifuji 1976, c.f. Iljic 1994: 94). As illustrated in (14), the existential sentence allows bare nouns but not N-men.

---

\(^2\) According to Chao (1968) and Norman (1988), *-men* is a plural morpheme when it is attached to pronouns but a collective marker when it is attached to common nouns. Cheung (2003) and Hsieh (2008), on other hand, hold the view that *-men* is a collective marker when using with pronouns and proper names but a plural marker when using with common nouns.
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(14) a. *you ren-men have person-MEN
    a'. you ren have person
    ‘There is/are some person(s).’
    b. *mei you ren-men NEG have person-MEN
    b'. mei you ren NEG have person
    ‘There is nobody.’ (Iljic 1994: 94)

Two, -men can appear with proper names (PNs), denoting the group consisting of the person expressed by the proper name. (Lü 1980, c.f. Iljic 1994: 95) (15). Three, -men cannot co-occur with numeral-classifier quantity expressions (Lü 1947; Chao 1968; Norman 1988) (16).

(15) Zhangsan-men zai nali? Zhangsan-MEN at where ‘Where is Zhangsan and the others?’

(16) *san-ge xuesheng-men three-Cl student-MEN ‘three student+men’ (Iljic 1994: 93)

Based on the above data, Iljic (1994: 91) argues that -men is not a plural morpheme but a collective marker which ‘constructs a group from several already posited elements’ and ‘pertains to the grammatical category of person’.

Contrary to the second view, the third view of -men treats it as a plural morpheme, as first argued by A. Li (1999) and further defended by many others (e.g. Kurafuji 2004; H. Yang 2005; Boskvoič and Hsieh 2013; Jiang 2012). Below I will focus on reviewing arguments from two representative analyses, A. Li (1999) and Kurafuji (2004).

A. Li (1999) provides four pieces of evidence to argue for the ‘plural morpheme’ analysis of -men. One, when occurring with pronouns, -men behaves like a plural morpheme, as we saw in (1).

Two, the -men suffixed proper name, in addition to receiving a 'group' interpretation (17i), can also refer to a plural individual with the same characteristics or the same name of the person expressed by the proper name (17ii).

(17) XiaoQiang-men XiaoQiang-MEN
    i. ‘XiaoQiang and the others’
    ii. ‘People with the characteristics or the same name of XiaoQiang.’ (A. Li 1999: 78)

According to A. Li, this additional interpretation in (17ii) makes -men a true plural marker since -men allows a proper name to behave like a common noun via pluralization.

Three, -men marked nouns can co-occur with dou, which has been claimed to be a distributive marker in some literature. According to Li, this compatibility of -men and
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dou, as shown in (18), raises questions for the ‘collective’ status of -men as argued in Iljic (1994).

(18) xuesheng-men dou li-kai le.
    student-MEN DOU leave ASP
    ‘Each of the students has left.’ (A. Li 1999: 80)

Four, -men is not completely incompatible with numeral-classifiers. Although it is true that -men marked nominal expressions cannot appear in the position following numeral-classifier (16), they can appear in the position preceding numeral-classifiers(-noun) when the nominal expression is a pronoun or a proper name (19a, b). Common nouns and -men, on the other hand, are still incompatible with numeral-classifiers (19c). Li further notices that the sentence in (19b) can only receive an associative reading of ‘a group of people containing the person denoted by the proper name and other people related to him/her’, but not the pure plural reading (19bii).

(19) a. wo qing ta-men san-ge (haizi) chifan.
    I invite them three-Cl (child) eat
    ‘I invited them three-Cl (children) for a meal’

b. wo qing XiaoQiang-men/xiaozhang-men san-ge (ren) chifan.
    I invite XiaoQiang-MEN/Principal-MEN three-Cl person eat
    i. ‘I invited XiaoQiang/Principal and two others (in the group) for a meal.’
    ii. *‘I invited 3 principals/3 people all named/all with the characteristics of XiaoQiang.’

c.*wo qing pengyou-men sange (ren) chifan.
    I invite friend-MEN three-Cl person eat
    ‘I invited three friends for a meal.’ (A. Li 1999: 79-80)

Based on the facts in (16) - (19), A. Li (1999) proposes a DP analysis for Mandarin definite nominal expressions, including phrases containing -men and definite bare nouns. Li assumes two (optional) projections, a Numeral Phrase (NumP) and a Classifier Phrase (ClP), within the DP projection and proposes that -men is a plural morpheme, similar to the plural morphology -s/-es in English (A. Li 1999: 91). Structurally, -men is generated in the head position of NumP but is realized on an element in head position of DP (20).

(20) Definite expressions: DP

In A. Li (1999), definiteness is assumed to be obtained when the D head position is filled with an overt element, along the same lines as Longobardi (1994). Li assumes that
common nouns are base-generated in the head of NP and that proper names are generated in the head of DP in Mandarin. When classifiers and numerals are absent, common nouns can move to the D position to pick up the plural morpheme -men, accounting for (2b), as illustrated in (21a).

(21) A. Li’s (1999) analysis of definite DP
   a. DP → D -men NP
      N xuesheng 'student'
   b. DP → D -men NumP san Num Num' pl
      Cl ge xuesheng 'student'
   c. DP → D ta-men NumP san Num Num' pl
      Cl ge xuesheng 'student'

In (21b), when numerals and classifiers are present, common nouns are blocked by the Cl head ge from moving to the D position to realize the plural morpheme -men. This structure explains why [common noun + men] cannot co-occur with numeral-classifiers in (16) and (19c). On the contrary, in (21c), pronouns and proper names are base-generated in the D position, so -men can be realized directly on them, and numeral-classifiers can also appear in a position lower than D. This structure explains (19a, b).

A. Li’s analysis which ties -men to the D position higher than numerals and classifiers not only provides a uniform structural account for phrases containing -men but also provides empirical evidence for the existence of DP projections in Mandarin.

Kurafuji (2004) adopts A. Li’s (1999) analysis and treats -men as a plural morpheme, appearing in the D position. Regarding the semantics, Kurafuji proposes that -men also functions as a definite marker. The phrase xuesheng-men 'the students' in (21a) has the semantics below.

(22) a. [[xuesheng]] = STUDENT <e>
   b. [[xuesheng]] = STUDENT <e, t>
   c. [[men]] = λP[σx[PL(P)(x)]] <<e, t>, e>>
   d. [[xuesheng-men]] = σx[PL(@student)(x) <e>]

Following Chierchia (1998b), Kurafuji assumes that bare nouns in classifier languages are kind-referring, type <e> (22a) and that the up-operator ‘¬’ can shift kinds to properties (22b) (see Chapter 2). In (22c), -men functions as plural marker as well as a definite determiner (22d). Specifically, PL is the pluralization function as in Chierchia (1998b),
'P' is the Cooperian property variable which denotes the most salient property in the context, and 'σ' is an operator that contributes to the definiteness of the plural morpheme (Kurafuji 2004: 226). In (22d), -men turns the property-denoting noun xuesheng 'student' into a plural individual with a definite interpretation.

Differing from A. Li (1999), Kurafuji provides a semantic type-theoretic explanation for the ungrammaticality of the phrase in (16) *san ge xuesheng-men 'three Cl student-men'. Kurafuji assumes that classifiers are property-seeking functions; however the xuesheng-men 'the students' is entity-denoting and cannot combine with property-seeking functions (Kurafuji 2004: 231). Noted that, Kurafui only discusses common nouns in Mandarin and assumes the use of -men with proper names (17) has a different semantics from the proposed one in (22).

This chapter defends the third view that -men is a plural morpheme as first argued by A. Li (1999); however, I do not agree with an analysis of positing men in the D position or treating men as a definite determiner. In the next section, I discuss empirical evidence that challenge such a DP analysis of -men.

### 3.3.2 Challenges for the DP analysis of -men

This subsection discusses facts about -men that challenge the DP analysis of -men. The main goal is to show that -men and facts about -men are independent of whether there is a D or in the grammar of Mandarin and that -men should be in a position local to nouns.

#### 3.3.2.1 Challenge 1: group classifiers and -men

The first challenge for the DP analysis of -men comes from the observation that -men is compatible with group classifiers such as qun 'group', zu 'team' and dui 'crowd' (e.g. Hsieh 2008: 151; Jiang 2012: 237). It is true that classifiers like ge do not allow –men to appear in the numeral-classifier-noun phrase as shown in (16) (as repeated in (23)), but the classifiers examined in previous work are all individual classifiers (see Chapter 1 for the discussion on different classifiers). If we replace individual classifiers with group classifiers, -men is allowed to appear in the [Numeral-Classifier-Noun] phrase, as illustrated in (24).

(23) *san-ge xuesheng-men
    three-Cl student-MEN
    ‘three student+men’
    (Iljic 1994: 93)

(24) a. Ta zai gen yi qun haizi-men wan.
    he in with one Cl group child-MEN play
    ‘He is playing with a group of children.’
    (Hsieh 2008: 151)

b. zhe (yi) qun haizi-men qu na-er le?
    this one Cl crowd/group kid-MEN go where ASP
    ‘Where did this crowd of kids go?’

c. ni-men xuexiao de zhe dui haizi-men tai neng naoteng le.
    2pl school De Dem Cl crowd,pile kid-MEN too can disturb ASP
    ‘This crowd of kids in your school are so naughty and disturbing.’
d. wo juede zhe liang zu xuexsheng-men de biao-xian dou bu cuo.
'I think the performances of these two teams of students are both very good.'

e. zhe si zu xuanshou-men kan-qilai dou xinxin man-man de.
'These four contestans all look very confident.'  (Jiang 2012: 237)

In addition to the above examples observed in Hsieh (2008) and Jiang (2012), examples of this sort can be widely seen in newspaper and literary work. Below, I provide some of the examples found in Beijing Language and Culture University DCC Corpus (BLCU Corpus in short, see Gou et al. 2016) and Peking University CCL Corpus (PKU Corpus in short):

(25)  
a. meidang xiawu xuexiao fangxue le.....tamen jiu hui zhunshi laidao
when afternoon school dismiss ASP they then will on-time come
Anhuili zhongxin xiaoxue, shou-ba-shou de fudao
Anhuili central primary-school hand-hold-hand De tutor
yi qun haizi-men xue minyue.
one Cl group child- MEN study folk-music (PKU Corpus, from China Daily)
'When class ends in the afternoon, they will come to Anhuili Central Primary School on time to teach a group of children folk music step by step.'

b. 64 sui de De Krautzun and one Cl group child- MEN together seriously do-PROG
warm-up exercises. (BLCU Corpus, from Wen Wei Po)
'The 64-year-old Krautzun is doing warm-up exercises seriously with a group of children.'

c. Huang yisheng shuo, dangshi kan zhe zhe qun xuexheng-men zai
Huang doctor say back-then see-Prog this Cl group student-MEN on
malu-shan junxun, jingchang you chezi he luren jingguo,
street-on military-training constantly exist car and people pass-by.
shizai shi weixian.
really is dangerous  (BLCU Corpus, from Xiamen Business News)
'Doctor Huang said, "at that time, I saw this group of students doing military training on the street, and cars and people were passing by constantly; it was really dangerous".'

d. zhe qun guniang-men weile zhe ci bisai fuchu le duoshao,
this Cl group girl-MEN for this Cl competition invest ASP how-many
3sg-Men heart-inside most clear (BLCU Corpus, from China Daily)
'They know the best how much (hard work and effort) this group of girls have devoted to this competition.'

e. shao da yixie de shihou, wo bian he yi qun huoban-men qu
a-little old a-bit De time I then with one Cl group partner- MEN go
linhun gan xi le.
neighbor-village hurry-on opera ASP (PKU Corpus, from China Daily)
'When I was a little older, I started to go to the nearby villages one after another with a group of partners to perform operas.'

f. **chongman huanxiang de xia ye, zong you yi qun haizi-men**
   fully-filled imagination De summer evening always exist one Cl\textsubscript{group} child-MEN
   nian-zhe ta, li san quan wai san quan de jiu zai wutong
   stick-Prog 3sg inside three circle outside three circle De gather at Paulownia
   shu xia ting Xiao Mingxu na yongyuan ye jiang-bu wan de gushi.
   tree under listen Xiao Mingxu that forever ever tell-not-finish De story
   (CCL Corpus, from Xiamen Daily)

'In the summer evenings that were filled fully with imaginations, there was always a group of children gathering under the paulowania tree and surrounding Xiao Mingxu, listening to his endless stories.'

g. **qiao! zher you yi qun xingfu de laoren-men**
   he youeryuan de
   Look! there exist one Cl\textsubscript{group} happy De old-man-MEN with kindergarten De
   haizi-men yiqi guoqi-le jie.
   kid-Men together celebrate-ASP festival
   (PKU Corpus, from Xiamen Evening News)

'Look! There is a group of happy old men celebrating the festival with the kindergarten kids.'

As we saw in Section 3.3.1, the ungrammaticality of the phrase in (16) (as repeated in (25a)), according to A. Li’s (1999) DP analysis, is due to the occurrence of the classifier ge which blocks common nouns from moving to the D position to realize -men (21b) (as repeated in (25b)). Then one may wonder why the occurrence of the classifiers in (23) and (24) does not prevent the common nouns from moving to the D position to combine with -men.

(26) a. ***san ge xuesheng-men**
   three Cl student- MEN

   b. 

   Kurafuji (2004), on the other hand, attributes the ungrammaticality in (25a) to the semantic type of the -men phrase (as type <e>) which is not the correct semantic type that classifiers are looking for. Similarly, one may also wonder why the -men phrases in (24) and (25) allow the classifiers to combine with them.

   If we examine closer, we can notice that the examples in (24) and (25) show some important differences between N-men in Mandarin and the definite plural the Ns in English. One, N-men can be used with group classifiers but definite plurals in English cannot:
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(27)  
a. *one group of the kids  
b. *a crowd of the kids  
c. *two teams of the students  

Two, we can posit the existence of phrases containing N-men, as we saw in (25f) and (25g), but cannot do so with definite plurals in English:

(28)  
a. *There was always a group of the children surrounding Xiao Mingxu.  
b. *Look! There is a group of the happy old men celebrating the festival with the kindergarten kids.  

This subsection showed that -men is compatible with numeral-classifier quantity expressions when the classifier is a group classifier. The examples observed by previous researchers (24) and the examples easily found in corpora (25) showed that N-men in Mandarin is not the equivalence of definite plural the Ns in English and that -men should be in a position lower than the numeral-classifier and local to the nouns. Next, I will move on to the second challenge for the DP analysis of -men.

3.3.2.2 Challenge 2: individual classifiers and -men

The second challenge for the DP analysis of -men comes from the fact that -men is not completely banned in the position following individual classifiers. It is true that -men is banned in the post-classifier position in examples like (16)/(25a) (as repeated in (29a)); however, as noted in Hsieh (2008: 151), in some cases, -men is allowed in the post-classifier position (28b). In addition to Hsieh's examples, I provide further examples found in the BLCU Corpus in (30).

(29)  
a. *san-ge xuesheng-men 
   three-Cl student-MEN  

b. ...sanbai duo wei laoshi ji juanshu-men 
   three:hundred more CL teacher and family:dependant-MEN 
   posuoqiwu... 
   beautifully:dance  
   ‘…more than three hundred teachers and their family dependants danced beautifully…’ (Academia Sinica Corpus, Hsieh 2008: 151)

(30)  
a. zai shi ji ge tongxue-men de qianhuouyong xia, 
   at ten a-few Cl classmate-MEN De have-a-retinue-before-and-behind  
   Yan Yuhong zou le chuqu.  
   Yan Yuhong walk ASP out (BLCU Corpus, from West China Metropolis Daily)  
   'With ten-odd classmates crowding around, Yan Yuhong walked out.'  

b. jijian-jiaolian Liu Yuling zhengzai zhidao 
   fencing-instructor Liu Yuling Prog guide  
   qishi duo ge xuesheng-men lianxi.  
   seventy many Cl student-MEN practice  
   'The fencing instructor Liu Yuling is giving seventy-some students directions to
practice fencing' (BLCU Corpus, from Guangzhou Daily)
c. ruguo keyi gei wo xuan, wo hai shi xiang hui dao guoqu,
    if can give 1sg choose 1sg still be want return arrive past
    ji bai ge tongshi-men yiqi zuo-hua,
a-few hundred Cl colleagues-MEN together make-painting
te you ganjue.
very have feeling
'If I could choose, I still would like to go back to the past, painting with
several-hundred colleagues; that really feels good.'
    (BLCU Corpus, from Yangcheng Evening News)

The above examples further suggest that the presence of the individual classifier ge is not
a factor that prevents the common nouns from combing with -men as in (21b)/(26b).

As one examines closer, it can be observed that the numerals in the above
examples differ from bare numerals like shi 'ten' or qishi 'seventy' in that they are
modified by a morpheme ji 'how many/(number)/a few' or duo 'how/many'. In particular,
shi-jì 'ten-ji' in (30a) ranges from 11 to 19; qishi-duó 'seventy-duó' in (30b) ranges from
71 to 79; ji-bài 'ji-hundred' in (30c) ranges from 100 to 900. Morphemes like ji 'how
many/(number)/a few' and duo 'how/many' are referred to as "quantitative determinatives";
they do not give exact numbers but express relative quantities by providing a range of
numbers (Chao 1968: 578-582; Lü et al 1999: 184-187, 290). When using ji or duo with
numerals, the context is quantification of approximation and conveys the speakers'
uncertainty about the precise number. I refer to phrases that contain numerals and
quantitative determinatives like ji and duo as Numerical Approximation Phrases.3

Note that, the numeral approximation phrase containing N-men in (30) and (29b)
exhibits differences from the phrase without -men. First, existential sentences allow the
latter not the former:

(31) a. zhe ge ban you qishi-duo ge xuesheng.
    this Cl class have seventy-many Cl student
    'This class has seventy-some students.'

b. *zhe ge ban you qishi-duo ge xuesheng-men.
    this Cl class have seventy-many Cl student-MEN

Second, the [Num-Approximation Cl N] phrase implies existence of other individuals
denoted by the noun, whereas the [Num-Approximation Cl N-men] phrase does not have
such an implication. Consider the following two sentences:

(32) a. wo kanjian shi-jì ge xuesheng zhengzai lianxi jijian.
    1sg see ten-a few Cl student Prog practice fencing
    'I saw 10 plus x students practicing fencing.'

3 I name this construction after Anderson (2015) who refers to English phrases like seventy-some, twenty-
some as 'Numerical Approximation using some'.

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The sentence in (32a) implies existence of other students besides those who were practicing fencing. Instead, (32b) implies that all students in the context were included and that they were practicing fencing.

This subsection showed that -men is compatible with numeral-classifier expressions even when the classifier is a individual classifier (29b)/(30); however the numeral needs to express approximation. This fact further suggested that the presence of the individual classifier ge is not a factor that prevents common nouns from combining with -men as suggested in (21b)/(26b). I also illustrated that the [Num-Approximation Cl N-men] phrase differs from the phrase without -men (31). In the next subsection, I will present the third challenge for the DP analysis of -men.

### 3.3.2.3 Challenge 3: -men marked common nouns in the pre-classifier position

The third piece of evidence that challenges the DP analysis of -men comes from the observation that common nouns are not completely banned in the position preceding the numeral-classifier. Recall the example that we saw in (19c) in which common nouns are disallowed to combine with -men to appear in the position preceding numeral-classifiers (as repeated in (33)). However, we do observe some examples in which [common noun + men] can appear before the numeral-classifier, especially when a context is provided, as illustrated in (34).

(33)  
*wo qing pengyou-men san-ge (ren) chifan.*  
I invite friend-MEN three-Cl person eat  
‘I invited three friends for a meal.’

(34)  
a. Context: in a family in which there are three kids; the mother said to the father:  
*ba hai-zi men san ge (ren) jiao xia lai chi wan-fan.*  
BA child-MEN three Cl person ask down come eat late-meal  
‘Go to get the kids, three of them, to come downstairs to have dinner.’

b. Context: the speaker is running for President for the student council and knows that the hearer's three sister haven't voted yet, so the speaker said to the hearer:  
*jiao (ni) jiejie-men san ge (ren) dou lai tou-piao ba.*  
ask you sister-MEN three Cl person all come vote SFP  
‘Tell your sisters, them three, to come to vote.’

c. Context: the hearer is leaving for school abroad; the speaker handed a farewell gift to the hearer and said:  
*zhe shi xiongdi-men ji ge (ren) de xinyi, xiwang ni yiqie shunli.*  
this is brother-MEN several Cl person De regard hope you all smooth  
‘This is the regard from the brothers, them several; hope all things go well with you.’
The above examples in (34) also suggest that the presence of the individual classifier *ge* is not a factor that prevents the common nouns from appearing in the pre-classifier position. But more importantly, I would like to address the general syntactic and semantic properties of this [N-*men* Num Cl] phrase which differs greatly from the numeral-classifier noun phrase [Num Cl N]; I will discuss these properties in Section 3.4.

### 3.4 Two less addressed properties of phrases containing -*men*

The purpose of this section is to illustrate the properties of two types of phrases containing -*men*, [N-*men* Num Cl] and N-*men*, which are less addressed in the literature. I will start with the [N-*men* Num Cl] phrase and its syntactic and semantic properties.

#### 3.4.1 [N-*men* Num Cl]: its appositive nature

Iljic (1994: 93-94) and A. Li (1999: 95, fn.13) both noted that in the [N-*men* Num Cl] phrase, the numeral-classifier is a non-restrictive (i.e. appositive) modifier to N-*men*. This is to say, instead of restricting the definite N-*men* phrase, the numeral-classifier provides additional descriptive information to it (i.e. the numeral information about the members in the group). Compared with the restrictive structure [Num Cl N] which has been widely discussed and examined in the literature (Tang 1990; A. Li 1998, Cheng and Sybesma 1999; Chierchia 1998b; Yang 2001, X. Li 2011, Jiang 2012; Zhang 2013, a.o.), the non-restrictive structure [N-*men* Num Cl] has received much less attention. Below I examine the properties of the [N-*men* Num Cl] phrase.

Structurally, the [N-*men* Num Cl] structure has three properties. First, a noun denoting ‘person’ is allowed after the numeral-classifier (A. Li 1999). This applies to pronouns, proper names and common nouns, as illustrated below.

\[(35)\]  
a. *wo qing ta-men san-ge (haizi) chifan.*  
   ‘I invited them three-Cl (children) eat’

b. *wo qing xiaozhang-men san-ge (ren) chifan.*  
   ‘I invited Principal and two others (in the group) for a meal.’ (A. Li 1999: 80)

c. *qu jiao haizi-men san-ge (ren) xia lai chi wan-fan.*  
   ‘Go to get the kids, three of them, to come downstairs to have dinner.’

One crucial point that the examples above illustrate is that the nouns should not be treated as being moved from the post-classifier position since that position is a filled position (by a noun denoting ‘person’).

The second syntactic property of the [N-*men* Num Cl] phrase is that the occurrence of -*men* is obligatory:  

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4 One exception to this generalization is the case in which the numeral is *one* and the classifier is an individual classifier:
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(36) a. *wo qing ta*(-men) san-ge (haizi) chifan.
    I invite them three-Cl (child) eat
    ‘I invited them three (children) for a meal’

b. *wo qing xiaozhang*(-men) san-ge (ren) chifan.
    I invite Principal-MEN three-Cl person eat
    ‘I invited Principal and two others (in the group) for a meal.’ (A. Li 1999: 80)

c. *qu jiao haizi*(-men) san ge (ren) xia lai chi wan-fan
    go ask child-MEN three Cl person down come eat late-meal
    ‘Go to get the kids, three of them, to come downstairs to have dinner.’

In contrast, -men in the pre-nominal numeral-classifier phrase [Num Cl N] is either optional or banned, as we saw in Section 3.3.2. Three examples are repeated below.

(37) a. *qu jiao san ge hai-zi (*men) xia lou lai chi wan-fan
    go ask three Cl child-MEN down stair come eat late-meal
    ‘Go to get three kids to come downstairs to have dinner.’

b. *zhe yi qun haiizi(-men) qu na-er le?
    this one Cl group kid-MEN go where Asp
    ‘Where did this group of kids go?’

c. *Liu Yuling zhengzai zhidao qishi duo ge xuesheng(-men) lianxi.
    Liu Yuling Prog guide seventy more Cl student-MEN practice
    'Liu Yuling is providing practice guidance to seventy-some students.'

Third, N-men and the numeral-classifier can undergo movement to the topic position or the post-*ba* position. Examples are given below.

(38) a. *ta-men san ge a, wo hui qing lai chi wanfan.
    3sg-Men three Cl Top I will invite come eat dinner
    ‘They, three, I will invite to come for dinner.’

b. *ba Xiaozhang-men san ge jiao xia lai chi wan-fan.
    Ba Xiaozhang-MEN three Cl ask down come eat late-meal
    ‘Go to ask Xiaozhang and two others (in the group) to come downstairs to have dinner.’

c. *ba hai-zi men san ge jiao xia lai chi wan-fan.
    BA child-MEN three Cl ask down come eat late-meal
    ‘Go to ask the kids, three of them, to come downstairs to have dinner.’

Semantically, the [N-men Num Cl] phrase receives a definite interpretation. Let us compare the examples in (39) and (40); we can posit the existence of the [Num Cl N] phrases (39) but cannot do so with the [N-men Num Cl] phrases (40).

(i) *Zhangsan(*-men) yi ge ren juran chi-le liu wan fan.
    Zhangsan MEN one Cl person unexpectedly eat-Perf six bowl rice
    ‘Zhangsan, one person, unexpectedly ate six bowls of rice.’

In the above example, -men is not allowed to appear, and this is not surprising, i.e. -men requires a plural individual, but the numeral yi ‘one’ is singular which cannot satisfy the number requirement by -men.
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(39) you san ge haizi zai wu-li zuo zuoye
exist three Cl kid at room-inside do homework
'There are three kids doing homework in the room.'

(40) a. (*you) ta-men san ge zai wu-li zuo zuoye.
exist 3sg-MEN three Cl at room-inside do homework
'They, three, are doing homework in the room.'
b. (*you) Xiaozhang-men san ge zai wu-li zuo zuoye.
exist Xiaozhang-MEN three Cl at room-inside do homework
'Xiaozhang and two other (in the group) are doing homework in the room.'
c. (*you) haizi-men san ge zai wu-li zuo zuoye.
exist kid-MEN three Cl at room-inside do homework
'The kids, three of them, are doing homework in the room.'

In (39), the [Num Cl N] phrase refers to some individuals mentioned for the first time in the discourse. In contrast, the [N-men Num Cl] phrases in (40) refer to some salient individuals familiar to the hearer.

Another semantic property of the [N-men Num Cl] phrase is that the numeral serves to provide additional descriptive information to N-men, and the numeral information provided by the numeral should be the total/maximal number of the group. For instance, in a scenario where there are five others in the group associated with Xiaozhang, to use Xiaozhang-men san ge as in (40b) to refer to Xiaozhang and two others out of the five in this group would be problematic. Similarly, in a scenario where there are five kids in a family, to use haizi-men san ge in (40c) to refer to three out of the five kids would be problematic. To further illustrate this point, let us consider a contrast in the following examples.

(41) a. wo kanjian san ge haizi toutou-di zou chuqu le.
1sg see three Cl kid secretly walk out Asp
'I saw three kids walking outside secretly.'
b. wo kanjian haizi-men san ge toutou-di zou chuqu le.
1sg see kid-MEN three Cl secretly walk out Asp
'I saw three kids walking outside secretly.'

In (41a), the numeral san 'three' is a restrictive modifier, when uttering this sentence, the [Num Cl N] phrase can imply the existence of other kids besides those who walked out secretly. On the contrary, the numeral san 'three' in (41b) is a non-restrictive modifier and denotes the total/maximal number of kids in the scenario, and the [N-men Num Cl] phrase does not have an implication of other kids in the context. That is to say, if there are more than three kids in the contexts, it is felicitous to utter the sentence in (41a) but infelicitous to utter the one in (41b).

Note that, the two underlined phrases in (45) are not minimal pair; as mentioned before, san ge haizi-men 'three kid-men' is not a grammatical phrase (16)/(25a), and haizi san ge 'kid three Cl' is not a grammatical
Next, let us move on to the N-men phrase and its additional property.

### 3.4.2 N-men: its generic reading

This subsection discusses an additional property of the [Common Noun + men] phrase, namely that it can receive a generic reading.

It has been claimed in the literature that -men marked common nouns can never receive a generic reading (Rygalkoff 1973; Yorifuji 1976, c.f. Iljic 1994: 94); the following two examples have been used to illustrate this point:

(42) a. *Tamen shi laoshi(*-men)*

   they be teacher-MEN

   ‘They are teachers.’

b. *ren-men*

   person-MEN

   ‘(given) individuals’

   NOT: ‘the mankind, people (in general)’

   (Iljic 1994: 94)

The above two examples cannot illustrate the point that the [Common Noun + men] phrase can never receive a generic interpretation. First, the example in (46a) only shows that the [Common Noun + men] phrase cannot be used as a predicate. Second, the example in (42b) at most shows that the [Common Noun + men] phrase cannot refer to kinds; this can be further supported by the examples below in which kind-level predicates disallow an argument containing -men:

(43) a. *baiwanfuweng(-*men) yi jing h en pubian le.*

   millionaire-MEN already very common Asp

   ‘Millionaires are very common now.’

b. *hao nanren(*/?-men) yi jing kuai juezhong le.*

   good man-MEN already soon extinct Asp

   ‘Good men are becoming extinct very soon.’

Although the [Common Noun + men] phrase cannot receive a kind interpretation, it can appear in generic sentences, receiving a generic interpretation (Jiang 2012: 248), as exemplified below.

(44) a. *haizi-men shi zuguo de weilai.*

   child-MEN is nation De future

   i. [generic]: ‘Children (in general) are the future of our nation.’

   ii. [definite]: ‘The children are the future of our nation.’

b. *fumu zhijian de zhengchao hen rongyi gei haizi-men dai-lai shanghai.*

   parents between De fight very easy give kid-MEN bring-come harm

phrase either (40). Consequently, the phrases in (45) are the only two grammatical ones that can be used for comparison.
i. [generic]: ‘Fights between parents can easily bring harms to kids (in
general).’
ii. [definite]: ‘Fights between parents can very easily bring harms to the kids.’
c. zhongguo de fumu-men hen xihuan ganyu haizi-men de shenghuo
   China De parent-MEN very like intervene kid-MEN De life
i. [generic]: ‘Chinese parents (in general) like intervening in the lives of their
   children.’
ii. [definite]: ‘The Chinese parents like intervening in the lives of their
   children.’
d. xiaofangyuan-men hen yong-gan.
   fireman-MEN very brave
i. [generic]: ‘Firemen (in general) are very brave.’
ii. [definite]: ‘The firemen are very brave.’
e. gou-gou-men qishi shi hen mingan de.
   dog dog (doggie)-MEN indeed be very sensitive De
i. [generic]: ‘Dogs (in general) are very sensitive indeed.’
ii. [definite]: ‘The dogs are very sensitive indeed.’ (Jiang 2012: 248)

The sentences in (48) are generic sentences which report a kind of general property (see Krifka et al 1995: 2). The -men suffixed common nouns in these sentences receive a
generic interpretation in addition to a definite interpretation which refers to a plural
individual previously introduced in the context. Note that, -men is optional in all cases;
although N-men in the above sentences can receive a generic interpretation, bare nouns
without -men are preferred for the generic use.

In this section, we saw the properties of the two types of phrases containing -men,
i.e. the [N-men Num Cl] phrase and N-men, which are less commonly addressed in the
literature. The [N-men Num Cl] phrase, which is non-restrictive, differs greatly from the
[Num Cl N] phrase, which is restrictive, both syntactically and semantically. The [N-men]
can receive a generic reading, in addition to the well-known definite reading.

Although I argued against the DP analysis of -men in A. Li (1999), I will, in the
next section, defend her view that -men is a plural morpheme and propose that -men is an
associative plural. It will be shown in Section 3.6 that the proposed analysis of -men
together with the D-less analysis of bare arguments in Mandarin developed in Chapter 2
can account for the syntactic and semantic properties of the four types of phrases
containing -men in a principled manner.

### 3.5 Associative plural marker -men and a split analysis of plurality

In this section, I propose an alternative analysis of -men. Among the properties of -men,
as we saw in Section 3.3 and Section 3.4, one that distinguishes -men from the canonical
additive plural markers like English -s/-es is its grouping effect with singular reference.
For instance, in English Johns only refers to ‘people all named John’ and cannot refer to
’a salient group which is represented by John and contains people associated with him’;
whereas XiaoQiang-men in Mandarin has both the additive plural and the associative
plural interpretations as we saw in (17) (as repeated in (46)).
It is crucial to point out that, this "grouping"/"associative" property of -men is not unique to Mandarin; other languages also have similar morphemes that show such an associative grouping effect with singular reference, such as -tati in Japanese (Moravcsik 2003; Nakanishi and Tomioka 2004), -ra in Bangala (Dayal 2012, 2014; Biswas 2014), -ék in Hungarian (Moravcsik 1994, 2003; Corbett 2000; Dékány 2011) and -hulle in Afrikaans (den Besten 1996), as illustrated below:

All examples in (47) consist of a proper name and a morpheme and denote a set comprised of the referent of the proper name and one or more associated individuals. These morphemes that appear with proper names in (47) have been referred to as 'associative plurals' (or 'grouping plurals') (Moravcsik 1994, 2003; den Besten 1996; Corbett 2000; Nakanishi and Tomioka 2004; Vassilieva 2005; Dékány 2011; Dayal 2012; Biswas 2014, a.o.). Cross-linguistically, associative plurals are found to be restricted to pronouns, proper names and human nouns, with the focal referent interpreted as definite (Vassilieva 2005, c.f. Biswas 2014).

Based on the properties of -men shown in Section 3.3 and Section 3.4 and the similarities between -men and the above morphemes in (47), I analyze -men in Mandarin as an associative plural.

Let us first settle on the semantics of -men. Building on the analysis of the associative plural -tati in Japanese proposed in Nakanishi and Tomioka (2004), I propose that -men maps a kind to a salient group, type \(<e^k, <e,t>>\); the semantics of -men is proposed to be the one in (48).
In (48), \( k \) is a kind and \( k_{\text{human}} \) is a human kind, \( Y \) is a set of plural individuals, type \(<e, t>\), and \( G \) is a group function mapping a kind to a salient group.\(^6\) Note that, Nakanishi and Tomioka (2004) treat common nouns in Japanese as properties of type \(<e, t>\) and proper names as entities of type \(<e>\); they propose the following two semantics types for the associative plural -tati in Japanese:

\[
(49) \quad \text{a. } [\text{[tati]}] \in D_{<e,t>,<e,t>} = \lambda P_{<e,t>,<e,t>} = \lambda P_{<e,t>} \lambda Y_e. |Y| \geq 2 \& P \text{ represents } Y
\]

\[
\text{b. } [\text{[tati]}] \in D_{<e,e,t>} = \lambda x_e \lambda Y_e. x \subseteq Y \& |Y| \geq 2 \& x \text{ represents } Y
\]

Differing from Nakanishi and Tomioka (2004) who propose two semantic types for the associative plural -tati in Japanese depending whether the plural is combined with proper names or common nouns, I propose that the semantics of -men remains the same regardless of what types of nominals it combine with.\(^7\) Specifically, if \( k \) is a regular kind, like ‘kids’, \( G \) picks out an instance of that kind to represent the group, if \( k \) is an individual kind (e.g. singular individuals/proper names), such as XiaoQiang or President, \( G \) picks out that individual who is saliently associated with a group to represent the group, that is, \( Y \) can be viewed as a representative group associated with \( k \). In other words, all bare nominals in Mandarin, including common nouns and proper names, in Mandarin denote kinds and are all noun phrases; the difference between them is that the former is natural, regular kinds, but the latter is individual kinds. I consider two reasons to treat all bare nominals in Mandarin as kinds. First, syntactically, a number of arguments have been provided to argue that even pronouns can be NPs rather than DPs in languages without overt determiners (see, e.g. Fukui 1988; Noguchi 1997; Neelam and Szendrői 2007; Bošković 2008, Despić 2011; Runcić 2014a, b; Melchin 2015). Second, semantically, it has been argued that pronouns can be regarded as the result of deleted NPs (see e.g. Heim and Kratzer 1998, Elbourne 2001, 2002, 2005).

From now on, I will use the term 'noun' to refer common nouns, pronouns and proper names throughout this chapter (see Bošković and Hsieh 2013 for a similar treatment). After -men combines with a noun, the N-men is predicative, type \(<e, t>\).

Turning to the syntax of -men, I propose an associative plural projection closer to the noun and lower than the classifier phrase, building on the split analysis of plurality (e.g. Wiltschko 2008; Kramer 2009, 2010, 2016; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zarekar 2015):

\[\text{Plurals and complex nominal arguments in Mandarin}\]

\[
(48) \quad \text{-men } \lambda k \lambda Y \left[\sim k_{\text{human}} \land |Y| \geq 2 \land G(k) = Y\right]
\]
The head of the associative plural phrase (AssPlP in short) in (50a) indicates plurality, group and human; the plural feature [+pl], the group feature [group] and the human feature [human] surface as a suffix -men (see Dékány 2011 for a similar analysis of Hungarian associative plural -ek).⁸ The suffix -men needs to be realized on nouns, and this can be done by assuming that nouns move up to the head of AssPlP to realize the plural feature (see e.g. A. Li 1999; Boškvoić and Hsieh 2013; Mathieu and Zareikar 2015) or that the noun undergoes NP movement to the specifier position of the AssPlP (see e.g. Boškvoić and Hsieh 2013, fn 20).⁹ When numerals and classifiers are absent, N-men has a simpler structure as the one in (50b).

In the structure in (50a), I still retain the connection between the classifier and the dividing number morphology such as -s/-es in English established by many authors (Greenberg 1972; Sanches and Slobin 1973; T’sou 1976; Doetjes 1996, 2012; Chierchia 1998b; Cheng and Sybesma 1999; Fukui and Takano 2000; Borer 2005, Watanabe 2006, among others) (c.f. Chapter 2, Section 2.4.1). As discussed in Chapter 2, these authors either observe that the use of number morphology and that of classifiers are in complementary distribution (Sanches and Slobin 1973: 4; T’sou 1976: 1216), or they argue that their roles are parallel, i.e. classifiers and the number morphology both signal the presence of minimal parts and that ‘numerals need the presence of a syntactic marker of countability which can be either individual classifiers or number morphology’ (Doetjes 1996: 35). Based on either their parallel role or their complementary distribution, a number of authors identify classifiers with number morphology and propose that they should appear in same position in the structure (Doetjes 1996; Chierchia 1998b; Cheng and Sybesma 1999; Fukui and Takano 2000; Borer 2005; Watanabe, among others). I repeat the uniform structure of bare numeral (classifier) phrases argued in Chapter 2 below.

---

⁸ The term "associative plural phrase" AssPlP was first named by Dékány (2011) for Hungarian associative plural -ek (c.f. 46d). In Dékány (2011: 259-260), AssPlP in Hungarian is proposed to be in a position higher than DP and demonstratives: AssPl > D > Dem > Num > Cl > n.

⁹ Alternatively, we can assume that -men undergoes suffix hopping/lowering in PF to the noun (see e.g. Boškvoić and Hsieh 2013: fn 20; Kramer 2009, 2010, 2016).
In (51), the classifier and the canonical number morphology such as -s/-es in English appear in the same position, i.e. the head of the Classifier Phrase Cl. However, it is important to acknowledge that such complimentary distribution is not perfect. Counterexamples in which classifiers and number morphology co-occur have been observed in various languages such as Armenian (Gebhardt 2009: 258); Arabic (Borer and Ouwayda 2010); Ejagham (Aikhenvald 2000), Halkomelem (Wiltschko 2008); Mayan (Allan 1977; Zaavala 2000), Ojibwe (Allan 1977; Mathieu and Zareikar 2015), Tlingit (Aikhenvald 2000), Vietnamese (Goral 1979), Dutch and German (De Belder 2008, 2011; Ott 2011) (see Dékány 2011: 234 for a comprehensive list of languages that allow the co-occurrence). The fact that the plural element -men can co-occur with group classifiers (24)/(25) as well individual classifiers (29b)/(30) (c.f. Section 3.3.2) adds Mandarin to the list of languages above. In addition to the co-occurrence of classifiers and number morphology, some languages have one more type of plurals in the addition to the regular plural morphology, and they even allow the occurrence of double plurals, such as Breton (Acquaviva 2008: 260) and Amharic (Kramer 2009, 2010, 2016).

To account for the co-occurrence of classifiers and number morphology or the co-occurrence of double plurals, two main approaches have been proposed. One approach rejects the connection between classifiers and number morphology and assumes one projection dedicated to number morphology and another one dedicated to classifiers (e.g. Gebhardt 2009; Zhang 2013: 221-227). Alternatively, some authors still maintain such a connection between classifiers and number morphology and propose either a split analysis of plurality (e.g. Wiltschko 2008; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zareikar 2015; Kramer 2009, 2010, 2016) or a split analysis of classifiers (e.g. Svenonius 2008; Ott 2008). In addition to the above two approaches, some authors suggest that some of the counterexamples have been mis-analyzed (e.g. Borer and Ouwayda 2010). I refer the readers to Dékány (2011: 232-235) for a review of different approaches.

In this work, I choose the second approach which assumes a split analysis of plurality for two main reasons. First, such an approach not only accounts for the co-occurrence cases of classifiers and plurality and the co-occurrence cases of double plurals, but also it maintains the connection between classifiers and number morphology as established by previous scholars (Greenberg 1972; Sanches and Slobin 1973; T’sou 1976; Doetjes 1996, 2012; Chierchia 1998b; Cheng and Sybesma 1999; Borer 2005, among others). Second, this approach has cross-linguistic applicability and draws evidence from a wider range of languages. In particular, the proposed analysis of -men in (50a) is based

(52)  
```
  DP  
   #P  
  D  
  counting pl \rightarrow #P  
     DivP  
     Div^0  
     nP  
     n  
   NP  
```

The plural typology in (52) demonstrates where the different plurals available in the world\'s languages surface. The highest plural is the counting plural (Mathieu 2012, 2014; Mathieu and Zareikar 2015) which hosts plural of singulatives, plurals of plurals and plurals of measure words in English-type languages. The intermediate plural in (52) is the familiar dividing plural from Borer (2005), the head of which (\(\text{Div}^0\)) can also host the Chinese-type classifiers or sound plurals in Arabic; it has been argued that this head can also accommodate singulative markers and broken plurals (Mathieu 2012). The lowest plural (closer-to-root plural) in (52) is the lexical plural \(n\) (Lecarme 2002; Acquavia 2008; Wiltschko 2008; Kramer 2009, 2010, 2016; Alexiadou 2011; Harbour 2011); its head \(n\) can host idiosyncratic plurals in Somali (Lecarme 2002) and Halkomelem Salish (Wiltschko 2008) as well as Korean (Kwon and Zribi-Hertz 2004); in addition, it has been argued that the lexical plural \(n\) can accommodate group plurals in Amharic (Kramer 2016). Typologically, languages can have multiple types of plurals or just one type of plurals (c.f. Kramer 2016: 555).

Regarding Mandarin, the \(\text{Div}^0\) head in (52), which host classifiers or the familiar English-type of dividing plural (Borer 2005; Mathieu 2014; Mathieu and Zareikar 2015), corresponds to the classifier head Cl in (50a); the closer-to-root plural \(n\) in (52), which can host group plurals with a [+pl] and [group] feature (Kramer 2009, 2016), corresponds to the associative plural head AssPl in (50a). In other words, Mandarin, under the proposed analysis, is a language that realizes both \(\text{Div}^0\) and \(n\) within the nominal domain.

In the following section, I will illustrate how the proposed semantics and syntax of \(-men\) in (48) and (50) together with the D-less analysis of bare arguments in Mandarin developed in Chapter 2 account for the properties of the four types of phrases containing \(-men\) examined in Section 3.3 and Section 3.4: (i) N\(-men\), (ii) [Num Cl N\(-men\)], (iii) [Num-Approximation Cl N\(-men\)], and (iv) [N\(-men\) Num Cl (person)]. These four types of phrases will be analyzed in turn.

### 3.6 Derive four types of phrases containing \(-men\)
3.6.1 N-men

The goal of this subsection is to show that the proposed analysis of -men together with the D-less analysis of bare arguments in Mandarin developed in Chapter 2 can derive the properties of N-men in a principled manner. Below, I repeat the properties of N-men that we saw in Section 3.3 and Section 3.4.

(53)  
   i. [Common Noun -men] can receive a definite or a generic interpretation but not a kind nor an indefinite interpretation (14), (43), (44).  
   ii. [Proper Name -men] receives an associative or an additive plural reading (17).  
   iii. [Pronoun -men] receives an additive plural reading (1).

In Chapter 2 (Section 2.4.2), I argued that bare nouns in classifier languages including Mandarin denote kinds. I also showed that the different interpretations of bare nouns in Mandarin can be derived from their kind reference via the Neocarlsonian approach to bare nominals (Carlson 1977b; Chierchia 1998b; Dayal 2004) (c.f. Section 2.5.3). One important consequence of this approach is that bare nouns in Mandarin are always D-less. I repeat the components of the Neocarlsonian approach in (54) and (55).

(54)  
   a. Chierchia's (1998b) type-shifting operations  
      i. Kind-related type shifts:  
         (i) Predicativize: \( \lambda k = \lambda x [x \leq k] \), if \( k_s \) is defined, else undefined. \(<e^k>\rightarrow<e,t>\)  
         (ii) Derived Kind Predication (DKP):  
              If \( P \) applies to objects and \( k \) denotes a kind, then \( P(k) = \exists x[\lceil k(x) \land P(x)\rceil] \)  
   b. Three canonical argument forming type-shifts (ARG):  
      (i) Nominalize: \( \lambda s \rhd P_s \), if \( \lambda s \rhd P_s \) is in \( K \), else undefined. \(<e,t>\rightarrow<e^k>\)  
      (ii) Iota: \( \iota X = \text{the largest member of } X \) if there is one, else, undefined. \(<e,t>\rightarrow<e>\)  
      (iii) Existential closure: \( \exists X = \lambda P \exists y[X(y) \land P(y)] \) \(<e,t>\rightarrow<<e,t>\rhd t>\)

(55)  
   a. Ranking of Meaning:  
      (i) \( \cap > \{\iota, \exists\} \);  
      (ii) \( \{\lhd, \rhd\} > \exists \) (revised in Dayal (2004))  
   b. Blocking Principle (‘Type Shifting as Last Resort’)  
      For any type shifting operation \( \tau \) and any \( X: \tau(X) \), if there is a determiner \( D \) such that for any set \( X \) in its domain, \( D(X) = \tau(X) \)

In all examples that we saw, the N-men phrase is argumental, but the N-men phrase is predicative according to the proposed semantics of -men in (48). In particular, after -men combines with the kind-referring nouns, the N-men phrase is predicative, type \(<e, t>\).

To turn predicative nominals into arguments, a language can employ whatever device available, either overt ones (e.g. article determiners a/the in English) or covert ones (i.e. a null D or a semantic type-shifter). In our case, Mandarin lacks overt
determiners of the category D like the/a in English to turn N-men into arguments, but N-men can be turned into an argument via covert operations.

Theoretically, two covert operations can turn predicative nominals into arguments, a null D in the syntax (56a) (e.g. Longobardi 1994; Borer 2005) or a type-shift operation in the semantics (56b) (e.g. Partee 1987; Chierchia 1984, 1998; Dayal 2004). In this work, the term 'ARG' is used to represent covert argument-forming operations, i.e. a null D in the syntax and a covert type-shift in the semantics, and it can be viewed as a variable ranging over 'kinds' ∩, 'definites' ⊓, and 'indefinites' ⊔ (54b) (c.f. Chapter 2, Section 2.5.3).

(56) a. covert D in the syntax b. covert type-shifting in the semantics

Concerning whether we should choose the covert operation in the syntax (56a) or the covert operation in the semantic (56b) to argumentize N-men, one needs to acknowledge that there is no empirical evidence to support one over the other. It is also impossible to prove either of them to be wrong given that both operations are invisible. This work chooses the operation in (56b). The goal is to show that it is not necessary to stipulate a functional category D that is always invisible in Mandarin in order to account for the behaviors of its nominal arguments.

After choosing the covert operation in the semantics to argumentize N-men (56b), we need to decide which specific type-shifting operation comes to play. Recall that three canonical argument forming type-shifts are available, '⊔', '⊓', and '⊔' (54b). Theoretically, we should expect that N-men can be turned into an argument with a definite interpretation (via the iota operator) and an indefinite interpretation (via '⊔') as well as a kind interpretation (via '⊔'). Nevertheless, it is not the case that these three type-shifting operations apply to predicative nominals in a random fashion. Instead, they apply to predicative nominals and derive their interpretations in a principled manner, following a general principle Ranking of Meaning {⊔, ⊓} > ⊔ (55a). Such a general ranking is motivated by cross-linguistic data as well as theoretical considerations (c.f. Section 2.5.3).

Below, I will show how the interpretation of N-men is derived in a coherently principled manner via Ranking of Meaning (55a) and the proposed semantics of -men in (48). According to Ranking of Meaning, '⊔' and '⊔' rank over '⊔', so we expect that the iota operator '⊔' and the down-operator '⊔' will be chosen first to turn N-men into an argument. If these two operators cannot come to play, i.e. when they are blocked by overt article determiners (c.f. Blocking Principle (55b)), '⊔' will be selected, as a second choice.

Let us start with the iota operator "⊔". It can turn N-men in to an argument with a definite interpretation. This correctly captures the fact that N-men receives a definite reading:
In (57b), the bare noun *xuesheng* ‘student’ is kind-referring; when -men in (57c) combines with *xuesheng* 'student', the grouping function in the semantics of -men G picks out an instance of the student-kind to represent a salient group whose cardinality is more than one. Hence, ‘*xuesheng-men*’ in (57d) denotes a property of a salient group represented by one instance of the ‘student-kind’, type <e, t>. Next, iota "i" in (57e) turns the property-denoting *xuesheng-men* into an argument with a definite interpretation, that is, ‘the unique salient group whose cardinality is more than one and which is represented by one instance of the ‘student-kind’. Syntactically, *xuesheng-men* is an AssPlP (57g) and remains an AssPlP after iota "i" turns it into an argument.

Now let us consider the other type-shifting operator that shares the same ranking as the iota operator, i.e. the down-operator "∩" (c.f. *Rank of Meaning*). The down-operator can turn N-men into an argument with a kind interpretation. However, turning N-men to kinds is undefined because the semantics of N-men, i.e. a property of a salient group represented by one instance of the kind, does not satisfy the conceptual notion of a kind which corresponds to the plurality of all instances of the property (see Carlson 1977b for the detailed discussion of kinds). This correctly captures the fact that N-men is not compatible with a kind level predicate and cannot receive a kind reading (as seen in (43a) and repeated in (58a)).

Given that the iota operator "i" has come to play, turning N-men into an argument with a definite interpretation (57), the lower ranked existential operator "∃" is no longer an option for argumentizing N-men. *Rank of Meaning* (55a) correctly predicts that N-men
cannot receive an *indefinite* reading, capturing the fact in Mandarin (14a), as repeated in (59a).

(59)  a. *you ren-men*  
    have person-MEN
b. [[ren-men]] = λY [¬PERSON ∧ |Y| ≥ 2 ∧ G(PERSON) = Y]  
    <e, t>
c. ∃ [ren-men]  
    =∃Y [¬PERSON ∧ |Y| ≥ 2 ∧ G(PERSON) = Y], via '∃', ruled out by Ranking of Meaning

In addition to a definite interpretation, N-men can also receive a generic interpretation (44) (one example is repeated in (60a)).

(60) a. haizi-men shi zuguo de weilai.  
    child-MEN is nation De future
i. ‘Children (in general) are the future of our nation.’  
    [generic]
ii. ‘The children are the future of our nation.’

b. [[haizi-men]] = λY [¬CHILD ∧ |Y| ≥ 2 ∧ G(CHILD) = Y]  
    <e, t>
c. [[haizi-men shi zuguo de weilai]]  
    = ∀x, s [ACC(s₀, s) ∧ child-menₛ(x)] [be the future of our nationₛ(x)]

As shown in Chapter 2 (Section 2.2.3), the generic interpretation of a nominal is contributed by the Gen operator which quantifies over the whole generic sentence (e.g. Krifka et al 1995). In the generic sentence containing N-men (60a), the N-men phrase can remain as predicative of type <e, t> and denote a salient group (60b); after the generic operator applies to N-men (60c), a generic reading is derived, namely that 'Children (this salient group) are the future of the country'. Structurally, haizi-men is still an AssPlP (60d).

The examples analyzed above only concern common nouns; next, let us turn to the cases in which Ns are proper names (17) and pronouns (1). The derivation of [Proper Name-men] is essentially the same as that of [Common Noun-men]. I repeat an example in (61a).

(61) a. XiaoQiang-men  
    XiaoQiang-MEN
i. ‘XiaoQiang and the others’
ii. ‘People with the characteristics or the same name of Xiaoqiang.’

b. [[XiaoQiang]] = XIAOQIANG  
    <eₖ>
c. [[men]]ₕₖₜₕₗₘₖₗₗₘₘₗₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘₘ₈
In (61b), the proper name XiaoQiang is an individual kind, type $\langle k \rangle$; it combines with -men in (61c). $G$ picks out XiaoQiang who is saliently associated with a group whose cardinality is more than one to represent that group (61d). Last, iota $\iota$ turns the property-denoting ‘XiaoQiang-men’ into an argument with a definite interpretation (56e), that is, ‘the unique salient group whose cardinality is more than one and which is represented by XiaoQiang and contains the others associated with him,’ deriving the associative plural interpretation in (61ai).

Crucially, if XiaoQiang is not treated as an individual kind but a regular kind—people who are named XiaoQiang or people who have the same characteristics as XiaoQiang, $G$ will pick out an instance of that kind to represent a salient group whose cardinality is more than one. After the iota operator applies, ‘XiaoQiang-men’ refers to the unique salient group whose cardinality is more than one and which is represented by one instance of the ‘XiaoQiang-kind’, resulting in the additive plural interpretation in (61aii). Syntactically, ‘XiaoQiang-men’ still remains as an AssPlP, same as the ones in (57g) and (60d).

Regarding pronoun-men (1), its derivation is virtually the same as that of proper name-men. Specifically, if pronouns are regarded as the result of deleted NPs (e.g. see Heim and Kratzer 1998, Elbourne 2001, 2005), they could be seen as individual kinds like proper names. Hence, the derivation of pronoun-men resembles that of proper name-men in (61).

In this subsection, we saw that the proposed analysis of -men in Section 3.5 together with the Neocarlsonian approach to bare nominals (c.f. Chapter 2, Section 2.5.3), correctly predicted the definite and generic interpretations of N-men and ruled out its indefinite and kind interpretations. I showed that the derivation of proper name-men and pronoun-men is essentially the same as that of common noun-men. Structurally, N-men is an AssPlP and remains as an AssPlP regardless of whether N is a common noun, proper name or pronoun. Next, let us turn to the [Num Cl N-men ] phrase and its properties.

### 3.6.2 The [Num Cl N-men] phrase

In Section 3.3.2, we saw that N-men can combine with group classifiers, appearing in the post-classifier position (24)/(25); such a phrase can combine with a demonstrative (24b, 25c, d) or appear in existential sentences (25f, g). Two examples are repeated below:

(62)

\[
\text{a. zhe (yi) qun haizi-men qu na-er le?} \\
\text{this one Cl group child-MEN go where Asp} \\
\text{‘Where did this crowd of children go?’}
\]
b. zong     you     yi     qun               haizi-men   nian-zhe   ta.  
always exist one Cl\text{crowd/group} child-MEN stick-Prog 3sg  
'There is always a group of children surrounding him.'

c. zhe si zu xuanshou-men kan-qilai dou xinxin man-man de.  
this four Cl\text{team/group} contestant-MEN look all confidence full-full De  
'These four groups contestants all look very confident.'

As proposed in (50) (as repeated in (63)), the \([\text{Num} \text{Cl} \text{group} \text{N-men}]\) phrase has an associative plural projection between the classifier and the noun:

\[
\text{(63)}
\]

\[
\begin{array}{c}
\text{ClP}  \\
\text{NumP}
\end{array}
\]

\[
\begin{array}{c}
\text{Cl}  \\
\text{AssPlP}
\end{array}
\]

\[
\begin{array}{c}
\text{NP}  \\
\text{-men}
\end{array}
\]

In Chapter 2, I argued that classifiers serve to shift kinds to properties, enabling a number to combine with them (c.f. Section 2.4.2). Below I illustrate this with a group classifier \(\text{zu}\) 'team/section'.

\[
\text{(64)}
\]

a. liang zu   xuesheng  
two Cl\text{team/section} student  
'two teams/sections of students'

b. \([[zu]] = \lambda k \lambda x \exists n [^k(x) \land \mu_{\text{team/section}}(x) = n]\) \(<e^k, <e, t>>\)

c. \([[liang]] = \lambda P[\text{two}(P)]\) \(<<e, t>, <e, t>>\)

d. \([[liang zu xuesheng]] = \lambda x [^\text{\text{student}}(x) \land \mu_{\text{team/section}}(x) = \text{two}] <e, t>\)

In (64b), \(\text{zu}\) 'team, section' serves to turn the kind-referring noun \(\text{xuesheng}\) 'student' to a set measured in teams/sections; \(\mu_{\text{team/section}}(x)\) means that \(x\) is measured/formed in teams/sections. So \(\text{liang zu xuesheng}\) in (64d) denotes two teams/sections of students.

When \(-men\) combine with bare nouns, I propose that group classifiers have a derived use, i.e. they can turn salient sets to sets that contain specific information as to how the sets are formed/measured, e.g. by groups, by sections or by teams (65).

\[
\text{(65)}
\]

Derived use of group classifiers:

\(\text{Cl}_{\text{group/team/section/pile}} = \lambda G \lambda n \lambda x [G(x) \land \mu_{\text{group/team/section/pile}}(x) = n]\)

Take the phrase in (62a) as an example, the semantics of \(\text{yi qun haizi-men}\) 'a crowd of children' is given below:

\[
\text{(66)}
\]

a. \([[\text{haizi-men}]] = \lambda Y [^\text{\text{child}} \land |Y| \geq 2 \land G(\text{child})=Y]\) \(<e, t>\)

b. \([[\text{qun}}] = \lambda G \lambda x \exists n [G(x) \land \mu_{\text{group/crowd}}(x) = n]\) \(<<e,t>, <e,t>>\)

c. \([[\text{qun haizi-men}]] = \lambda x \exists n [\text{haizi-men}(x) \land \mu_{\text{group/crowd}}(x) = n]\) \(<e, t>\)

d. \([[\text{yi}]] = \lambda P[\text{one}(P)]\) \(<<e,t>, <e,t>>\)
e. \([\text{yi qun haizi-men}] = \lambda x [\text{haizi-men}(x) \land \mu_{\text{group/crowd}}(x) = \text{one}] \ <e, t>\)

In (66d), the numeral is treated as a predicate modifier (Ionin and Matushansky 2006, c.f. Chapter 2, Section 2.2.2), and the numeral classifier phrase containing -men yi qun haizi-men in (66e) is predicative, type <e, t>. Note that this analysis immediately accounts for the fact that the \([\text{Num} \text{ Cl}_{\text{group}} \text{ N-men}]\) phrase can be used as restrictors of demonstratives, as in (62a). I give below a derivation to show this.

\[(67) \quad = (62a)\]

a. \[
\begin{array}{c}
\text{Dem} \\
\text{zhe} \\
\text{yi} \\
\text{qun} \\
\text{haizi} \\
\text{men} \\
\text{AssPl} \\
\text{NP}
\end{array}
\]

\[
\begin{array}{c}
\text{CIP} \\
\text{Cl'} \\
\text{Cl'} \\
\text{AssClP}
\end{array}
\]

b. \([\text{yi qun haizi-men}] = \lambda x [\text{haizi-men}(x) \land \mu_{\text{group/crowd}}(x) = \text{one}] \ <e, t>\)

c. \([\text{zhe yi qun haizi-men}] = \text{\textsc{u}}(\text{haizi-men}(x) \land \mu_{\text{group/crowd}}(x) = \text{one} \land x \text{ is in this}_n) \ <e>\)

Regarding the structural position of demonstratives, I have adopted the view that they occur in the specifier position rather than the head position in Chapter 2 (Section 2.4.1) (Giusti 1997, 2002; Brugè 2000, 2002; Alexiadou et al. 2007, a.o.). As for the semantics of demonstratives, I follow Kaplan (1989), Wolter (2006) and Dayal (2012) and assume that demonstratives are property seeking functions with indexically individuated situations. Hence, the phrase \textit{zhe yi qun haizi-men} 'this group of kids' has the semantics in (67d), in which this$_n$ denotes a non-distal situation that the speaker is pointing at.

Note that the \([\text{Num} \text{ Cl}_{\text{group}} \text{ N-men}]\) phrase is predicative rather than argumental in (66b); as argued in Chapter 2 (Section 2.2.3), I argued that numerals have a predictable lexical variant in which they are property modifiers. I repeat this analysis of numerals below.

\[(68) \quad \text{Lexical view of ambiguous numerals}\]

a. \(\text{Numeral}_{<e, t>, <e, t>} = \lambda P \lambda x [n(x) \land P(x)]\)

b. \(\text{Numeral}_{<e, t>, <e, t>} = \lambda P f_\exists(\lambda x [n(x) \land P(x)])\)

If \(\alpha \in \text{Num}_{<e, t>, <e, t>}\), then \(\lambda P f_\exists(\lambda x [n(x) \land P(x)]) \in \text{Num}_{<e, t>, <e, t>}\)

\(f_\exists\) is subject to existential closure at arbitrarily chosen scope sites.

Under the above analysis of numerals, the numeral \textit{yi} 'one' in (62b) can be treated as a property modifier with a built-in choice function variable. The resulting numeral classifier phrase, as a consequence, is argumental. I give below a derivation to show this:

\[(69) \quad = (62b)\]

a. \([\text{yi}] = \lambda P f_\exists\text{one}(P)\) \ <e, t>, e>

b. \([\text{yi qun haizi-men}] = f_\exists (\lambda x [\text{haizi-men}(x) \land \mu_{\text{group}}(x) = \text{one}]) \ <e>\)
Crucially, under the above analysis, the predicative and the argumental [Num Cl N-men] phrases have the same structure, which is the one in (63). Such a structure does not require us to assume a functional category D that is invisible in the grammar of Mandarin to account for the behaviors of the numeral classifier phrases containing -men.

One last but very important fact to explain in this section is why -men is not allowed in the numeral-classifier-noun structure when the classifiers are individual classifiers, as seen in (16) and repeated in (70a). I propose that the structure of (70a) is the same as the one in (63) and that the unacceptability of (70a) is the result of the semantics of individual classifiers clashing with the denotation of N-men, as demonstrated below:

(70)

a. *san-ge xuesheng-men
   three-Cl student-MEN
   Intended: 'three students'

b. NumP
   san
   'three'
   ClP
   Cl'
   ge
   AssPlP
   xuesheng
   'student'

c. [[ge]] = λkλx [AT(\(\neg k\))(x)]<e, <e, t>>
d. [[xuesheng-men]] = λY [\(\neg \)STUDENT \& |Y| ≥ 2 \& G(STUDENT)=Y]<e, t>
e. [[ge xuesheng-men]] = ?? uninterpretable

As we saw in Chapter 2 (Section 2.4.2), individual classifiers like ge have been argued to turn kinds to a set of atomic instantiations of the kind (70c); however, N-men denotes a salient group of plural individuals (70d), which cannot provide the correct semantics that individual classifiers look for. Consequently, ge xuesheng-men is not interpretable in the semantics (70e), rendering the computation fail to proceed. In other words, the syntax allows an individual classifier to merge with N-men, but the combination of the two fails in the semantics, resulting in the unacceptability of (64a).

Having seen how the structure and semantics of [Num Cl N-men] phrase are analyzed, I now analyze the third type of phrases containing -men, the [Num-Approximation Cl N-men] phrase, and its properties.

### 3.6.3 The Numerical Approximation Construction
--[Num-Approximation Cl N-men]

In Section 2.2.2, we concluded that -men is allowed to appear in the position following individual classifiers in the numerical approximation construction using ji 'a few' or duo 'many' (29b)/(30). In order to understand the syntax and the semantics of the [Num-Approximation Cl N-men] phrase, let us fist understand the syntax and semantics of numeral approximation containing ji/duo.

#### 3.6.3.1 Syntax and semantics of numerical approximation using ji/duo
Numerals that involve multiplication (such as *qi-bai* 'seven hundred' which is formed by the multiplication of 7 and 100) and/or addition (such as *qishi-wu* 'seventy-five' which is formed by the addition of 70 and 5) are usually referred to as complex numbers (see Ionin and Matushansky 2006). Following Ionin and Matushansky (2006), I assume that additive numerals as well as multiplicative numerals are built up syntactically by coordinating smaller numerals, as illustrated below.

(71) a. additive numerals (*qishi-wu* 'seventy five')

```
  NumP
   /\         /\         /\     NumP
  | qishi     | ADD | wu     | Conj
 | 'seventy'  |     | 'five'  |
```

b. multiplicative numerals (*qi-bai* 'seven hundred')

```
  NumP
   /\         /\         /\     NumP
  | qi        | MUL | bai     | Conj
 | 'seven'   |     | 'hundred' |
```

The above structures of complex numbers also integrates the assumption that the head of the conjunctive phrase is a silent morpheme ADD (Anderson 2015) or a silent morpheme MUL (Mendia 2016). Regarding numerals, I assume that they can serve as predicates in addition to serving as adjectival modifiers and indefinite determiners. When numerals are predicates, I follow Solt (2015) and Anderson (2015) and assume that they denote properties of degrees, type <d, t>, similar to quantity words *many* and *a few*. The semantics of the simply numeral like *qi* 'seven' and that of ADD and MUL are given below.

(72) a. \[[n]\] = \(\lambda d[d = n]\) \(<d, t>\) (Solt 2015; Anderson 2015)

b. \[[\text{ADD}]\] = \(\lambda D\lambda D'\lambda d \exists d', d'' [d = d' + d'' \land D(d') \land D'(d'')]\) (Anderson 2015)

c. \[[\text{MUL}]\] = \(\lambda D\lambda D'\lambda d \exists d', d'' [d = d' \times d'' \land D(d') \land D'(d'')]\) (Mendia 2016)

Based on (72), the complex numerals *qishi-wu* 'seventy five' and *qi-bai* 'seven hundred' in (71) have the following derivation:

(73) *qishi-wu* 'seventy five'

a. \[[qishi]\] = \(\lambda d[d = seventy]\)

b. \[[wu]\] = \(\lambda d[d = five]\)

c. \[[qishi ADD wu]\] = \(\lambda d \exists d', d'' [d = d' + d'' \land [[seventy]] (d') \land [[five]] (d'')]\)
In (73c), *qi-shi-wu 'seventy five' is split into its component parts, a degree equal to 5 (73b) and a degree equal to 70 (73a); by adding 5 and 70, we obtain a newly formed property of degree 75. Similarly, *qi-bai 'seven hundred' (74f) is split into a degree equal to 100 (74e) and a degree equal to 7 (74d), and multiplication of 7 and 100 results in a newly formed property of degree 700.

Now, let us turn to numeric approximation using *yi 'a few/how many' and those using *duo 'many/how'; I will first demonstrate their syntactic and semantic properties, which will help us understand their syntax and semantics.

Numeral approximation constructions containing *yi/*duo exhibit two syntactic properties. One, the particular quantitative determinative may appear in different position. *Yi 'a few/how many' can either follow or precede the numeral, as in (75), whereas *duo 'many/how' cannot precede the numeral (76a) but only follow it (76b).

Two, the particular numeral being modified determines whether *yi/*duo is allowed. Specifically, ten and multiples of ten (e.g. 20, 30, 100, 160, 1000) allows the occurrence of *duo (77); as for *yi, round numbers lower than one hundred (i.e. ten to ninety) allow *yi to appear in the post-numeral position (78), and ten and powers of ten (e.g. 100, 1000, 1000) allow it to appear in the pre-numeral position (79).

Numeral approximation using *yi/*duo exhibit three semantic properties. First, the position of *yi/*duo corresponds to the meaning. Specifically, the post-numeral position corresponds
to the additive environment (see Chao 1968: 581), and the pre-numeral position corresponds to the multiplicative environment. For instance, *ji* 'a few' can be used additively (75b)/(78b) and multiplicatively (75a)/(79); *duo* 'many/how' can only be used additively, as in (76)/(77).

Second, this phrase denotes a range of number (Chao 1968: 581; Lü 1980); in other words, this phrase has its lower and upper bounds (i.e. it has the at least and at most readings). I illustrate it by creating situations where the truth or falsity of a statement is judged, along the lines proposed by Anderson (2015) for English numeral approximation using *some* (e.g. *twenty-some*). For instance, if a speaker had uttered a sentence in (80a), but in fact *Linguistics 101* this course has 19 students; in this case, (80a) is naturally thought of as being false; similarly, if *Linguistics 101* in fact has 33 students, (80a) is also thought of as being false. However, if in a situation, *Linguistics 101* has 23 students, (80a) would be judged true.10

(80)  

a. *yuyanxue 101 you ershi-ji/duo ge xuesheng.*  
   linguistics 101 have twenty-a few/many Cl student  
   'Linguistics 101 has twenty-some students.'

b. if *Linguistics 101* has 19 students, (25a) is judged to have been false.

c. if *Linguistics 101* has 33 students, (25a) is judged to have been false.

d. if *Linguistics 101* has 23 students, (25a) is judged to have been true.

The above property differentiates numeral approximation using *ji*/*duo* from the phrases below which merely gives approximate numbers without giving lower or upper bounds:

(81)  

a. *yuyanxue 101 you ershi ge xuesheng zuo-you.*  
   linguistics 101 have twenty Cl student left-right  
   'Linguistics 101 has around twenty students.'

b. *yuyanxue 101 you (da)yue ershi ge xuesheng.*  
   linguistics 101 have about twenty Cl student  
   'Linguistics 101 has about twenty students.'

I summarize the syntactic and semantic properties of numeral approximation using *duo* and those using *ji* in (82), which can help us understand the similarities and differences between *duo* and *ji* in numerical approximation.

---

10 Note that, *ji* differs from *duo* slightly in terms of the range of numbers; for example *shi-ji* 'ten-a few' ranges from 11 to 19, and *shi-duo* 'ten-many' has the same range but is more like to be under than over 15 (c.f. Chao 1968: 581). Since this semantic difference between *ji* and *duo* does not matter much for the purpose of discussion in this study, I will set aside this difference and assume that *ji* and *duo* are the same in the semantics for now.
(82) Numerical Approximation using *duo* and *ji*

<table>
<thead>
<tr>
<th><em>duo</em> 'many/how': to denote a range of number from 1-9</th>
<th>Position</th>
<th>Restrictions on Numeral</th>
<th>Relation to Numeral</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>post-numeral</td>
<td>ten and multiples of ten (e.g. 10, 20, 30, 100, 160, 1000)</td>
<td>additive</td>
<td>(78b-d)</td>
<td></td>
</tr>
<tr>
<td>*pre-numeral</td>
<td>N/A</td>
<td>N/A</td>
<td>(77a)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><em>ji</em> 'a few, how many': to denote a range of number from 1-9</th>
<th>Position</th>
<th>Restrictions on Numeral</th>
<th>Relation to Numeral</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>post-numeral</td>
<td>round numbers lower than one hundred (i.e. 10 to 90)</td>
<td>additive</td>
<td>(78)</td>
<td></td>
</tr>
<tr>
<td>pre-numeral</td>
<td>ten and powers of ten (e.g. 10, 100, 1000, 10000)</td>
<td>multiplicative</td>
<td>(79)</td>
<td></td>
</tr>
</tbody>
</table>

Crucially, numeral approximation using *ji/duo* and its properties are not unique to Mandarin; they are also attested in English (numerical approximation using *some*) as well as in Japanese (numeral approximation using *nam* 'what') (see Anderson 2015; Mendia 2016). Relevant examples from English and Japanese are provided below:

(83) a. **twenty-some** students  (English)  
b. *Juu-nan-nin-ka-ga* kita. '10 plus x people came.'  (Japanese)  
c. *Nan-juu-nin -ka-ga* kita. 'x multiple 10 people came.'  (Anderson 2015)

Based on the syntactic and semantic properties of numeral approximation using *ji/duo* (82) and the similarities among Mandarin, English and Japanese regarding their numerical approximation constructions (83), I propose that *ji/duo* can be analyzed in the similar way as *some* and *nun* along the lines in Anderson (2015) and Mendia (2016).

Syntactically, I analyze *ji* and *duo* as a quantifier head (Q). I consider two reasons for such an analysis. First, *duo* 'many' and *ji* 'a few' can also combine with a classifier-noun phrase without a numeral:

(84) a. **duo ge zhanghu**  
many Cl account  
'multiple accounts'  
b. **duo wei zhuangjia**  
many Cl expert  
'multiple experts'
c. *duo ming xuezhe
   many Cl     scholar
   'multiple scholars'
d. *duo ge xiangmu
   many Cl program
   'multiple programs'

Second, similar to numerals, *duo 'many' and *ji 'a few' do not combine with a noun directly (86)/(87), only with some exceptions (88) (see e.g. Chao 1968: 581-582).

(86) a. *duo zhanghu
    many account
    'many accounts'
b. *duo zhuanjia
    many expert
c. *duo xuezhe
    many scholar
d. *duo xiangmu
    many program

(87) a. *ji zhanghu
    a-few account
    'a few accounts'
b. *ji zhuanjia
    a-few expert
c. *ji xuezhe
    a-few scholar
d. *ji xiangmu
    a-few program

(88) a. duo nian
    many year
    'many years'
b. duo ri
    many day
    'many days'
c. ji nian
    a-few year
    'a few years'
d. ji ri
    a-few day
    'a few days'

Following Anderson (2015), I assume a silent noun NUMBER as the complement to Q, along the lines proposed in Kayne (2005a, Ch.10, 2010, Ch. 2) and Zweig (2005). The structure of numerical approximation using *ji and *duo are given below.
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(89)  
\( a. \text{qishi } ji/duo \)
seventy  a few/many
'seventy-some'

b. Structure of an additive numerical approximation phrase

\[
\text{ConjP} \quad \text{NumP} \quad \text{Conj'} \\
qishi \quad \text{ADD} \quad \text{QP} \quad \text{NP} \\
'seventy' \quad \text{'a few'/many'} \]

(90)  
\( a. \text{ji bai} \)
a-few hundred
'afew hundred'

b. Structure of a multiplicative numerical approximation phrase

\[
\text{ConjP} \quad \text{QP} \quad \text{Conj'} \\
\text{NP} \quad \text{Conj} \quad \text{Nump} \\
\text{ji} \quad \text{NUMBER} \quad \text{MUL} \quad \text{bai} \\
'\text{hundred}' \]

Regard the semantics of \( ji/duo \), it can be analyzed in the similar way as \textit{some} in numeral approximation phrase proposed in Anderson (2015) (91a).\footnote{Anderson’s (2015) analysis of English \textit{some} in numeral approximation structures is based on the analysis of Spanish \textit{-alguín}, a morpheme that can express ignorance with respect to number, in Alonso-Ovalle and Menéndez-Benito (2010).} As for the semantics of the silent noun \textit{NUMBER}, I adopt the analysis in Mendia (2016) which treats its denotation as the set of ‘basic’ numbers (91b).

(91)  
\( a. \[[ji/duo]] = \lambda f(dt, dt)\lambda D\lambda d: \text{anti-singleton}(f)[f(D)(d)] \)

\( b. \[[\text{NUMBER}]] = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \)

The logic forms of the two phrases in (89a) and (90a), after some reduction, would look as the ones below:

(92)  
\( a. \[[\text{qishi-ji}] = [[\text{qishi ADD ji NUMBER}] \]
\( = \lambda d\exists d', d''[d = d' + d'' \land [[\text{seventy}](d') \land [[\text{ji NUMBER}](d'')]] \]
\( = \lambda d\exists d', d''[d = d' + d'' \land [[\text{seventy}](d') \land f(0 < d'' < 10)] \]
\( = \lambda d [f(70 < d < 80)] \)

\( b. \[[\text{ji-bai}] = [[\text{ji NUMBER MUL bai}]] \]
\( = \lambda d\exists d', d''[d = d' \times d'' \land [[\text{ji NUMBER}](d') \land [[\text{hundred}](d'')]] \]
\( = \lambda d\exists d', d''[d = d' \times d'' \land f(0 < d' < 10) \land f(100 < d < 1000)] \]

\( = \lambda d [f(100 < d < 1000)] \)
With the analysis of numeral approximation using *ji/duo* in place, we now can proceed to analyze the [Num-Approximation Cl N-men] phrase.

### 3.6.3.2 Structure and semantics of [Num-Approximation Cl N-men]

I propose a right-adjunction structure for [Num-Approximation Cl N-men] (79b), with one example repeated in (93a).

(93)  
- a. *qishi ji/duo ge xuesheng-men*  
  seventy a few/many Cl student-MEN  
  'seventy-some students'

- b. 

```
  NumP
    ^
   qishi
     'seventy'

  Conj
    ^
  Conj'

  ClP
    ^
  AssPIP

  OP
    ^
  QP
    ^
  NP

  ge
  xuesheng-men

  AssPIP

  'students'
```

In (93b), the classifier and the complex numeral form a constituent, serving as a modifier to N-men. I consider two main reasons to support the above right-adjunction analysis. First, numerals and the classifiers can be used independently either as a predicate or an argument (Jiang 2009; X. Li 2011: 200, 2013: 225), as illustrated in (94) and (95).

(94)  
- a. *ta zhong le wubai ke de shu.*  
  he plant Perf 500 Cl De tree  
  'He planted five hundred trees.'

- b. *ta zhong de shu you wubai ke.*  
  he plant De tree have 500 Cl  
  'The trees he planted reached 500.' (X. Li 2011: 200)

(95)  
  Liu teacher PROG guide seventy more Cl student-MEN practice  
  'Teacher Liu is providing practice guidance to more than seventy students.'

  Liu teacher PROG guide student-MEN practice  
  dagai you qishi-duo ge.  
  about have seventy-many Cl  
  'Teacher Liu is providing practice guidance to the students, (the number of which is) probably seventy-some.'

Second, when numerals and classifiers form a constituent, the [Num Cl] unit has been argued to have a measuring interpretation in contrast with the [Num [Cl N]] unit in which the classifier and the noun form a constituent (Jiang 2009; X. Li 2011, 2013).
When numerals combine with individual classifiers as a constituent, I adopt the analysis in X. Li (2011: 200, 2013: 225) that the [Num-Cl{individual}] unit serves the function of estimation and that the estimation interpretation is brought about by the individual classifier. The derivation for the underlined phrase in (93a) is given below.

\[(96)\]

a. \[[ge]\] = \(\lambda n \lambda x \ [EST(x) = <n, U_{atom}>]\) \(\langle d, <e, t>\rangle\)

b. \[[qishi-ji]\] = \(\lambda d [f(70 < d < 80)] = (92)\) \(\langle d, t\rangle\)

c. \[[qishi-ji]\] = \(\lambda x [EST(x) = <d, <e, t>]\) \(\langle d\rangle\) (via iota)

d. \[[qishi-ji Cl_{ind}]\] = \(\lambda x [EST(x) = <d, <e, t>]\) \(\langle d, t\rangle\)

e. \[[xuesheng-men]\] = \(\lambda Y [\text{'STUDENT} \wedge |Y| \geq 2 \wedge G(\text{STUDENT})=Y]\) \(\langle e, t\rangle\)

f. \[[qishi-ji ge xuesheng-men]\] (via Predicate Modification) = \(\lambda x [EST(x) = <d, <e, t>]\) \(\langle d\rangle\) (via iota)

g. \[[qishi-ji ge xuesheng-men]\] = \(\lambda Y [\text{'STUDENT} \wedge |Y| \geq 2 \wedge G(\text{STUDENT})=Y]\) \(\langle e, t\rangle\)

In (96a), EST is an estimation function, which estimates the number of atomic entities (see X. Li 2011). The classifier ge takes a numeral \(n\) and returns a set of atomic entities whose estimated value is \(n\). In (96b), the denotation of qishi-ji 'seventy-some' is a property of degree, type \(\langle d, t\rangle\) (c.f. Section 3.5.1). At this point, the denotations of ge and qishi-ji are not compatible since ge needs a specific degree, not a property of degrees. This can be fixed by applying Partee's (1986) iota type-shifting operation to the property of degrees (96c) (see also Anderson 2015 for numerical approximation using some). So the modifier qishi-ji ge 'seventy-some Cl_{ind}' in (96d) denotes a set of atomic entities whose estimated value is seventy-some (70 \(<\ n \(<\ 80\), type \(\langle e, t\rangle\). The modified head AssPIP xuesheng-men denotes a salient group of students, also type \(\langle e, t\rangle\) (c.f. Section 3.6.1). By applying Heim and Kratzer's (1998) Predicate Modification to these two property-denoting phrases, the phrase 'qishi-ji ge xuesheng-men' in (93a) then denotes a salient group of students whose estimated value is seventy-some (i.e. more than 70 but less than 80) (96f). Note that, the modified phrase in (96f) denotes a property of type \(\langle e, t\rangle\). Here, the property-denoting phrase in (96f) can be turned into arguments via the device available in Mandarin.

According to Rank of Meaning in (55aii) (c.f. Section 3.6.1), the iota operator 't' and the down-operator '∴' kick in first. The iota operator 't' can turn the property-denoting AssPIP in (96f) into an argument with a definite interpretation, i.e. the group of students whose estimated value is seventy-some. Theoretically, the down-operator '∴' can turn the property-denoting AssPIP in (96f) into an argument, but with a kind interpretation; however, this possibility is ruled out since the denotation of kinds requires all individuals not just a salient group of individuals (whose estimated value is seventy-some) (97a). The availability of the iota type shifting excludes the possibility of turning the modified AssPIP into an argument with an indefinite interpretation via the existential operator '∃' (due to Rank of Meaning, (55aii)) (97b).
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(97) a. $[[\text{qishi-ji ge xuesheng-men}]]$ (via $\cap$)  
$= \exists x [\text{EST}(x) = d(f(70 < d < 80), U_{\text{atom}}) \land \text{xuesheng-men}(x)]$ ruled out  

b. $[[\text{qishi-ji ge xuesheng-men}]]$ (via $\exists$)  
$= \exists x [\text{EST}(x) = d(f(70 < d < 80), U_{\text{atom}}) \land \text{xuesheng-men}(x)]$ ruled out

The proposed semantics in (96) immediately explains why the existential sentence does not allow the [Num-Approximation Cl N-men] phrase, in contrast with the numeral classifier phrase (as seen in (31) and repeated in (98)), i.e. this phrase is a definite expression (96g) which does not satisfy the indefinite requirement of the existential sentence.

(98) a. $^*\text{zhe ge ban you qishi-duo ge xuesheng-men}$.  
\text{this Cl class have seventy-many Cl student- MEN}  

b. $\text{zhe ge ban you qishi-duo ge xuesheng}$.  
\text{this Cl class have seventy-many Cl student}  
\text{this class has seventy-some students.'}

One may wonder why the phrase in (16) $^*\text{san ge xuesheng-men}$, which received an analysis in (70) (as repeated in (99)), cannot be analyzed syntactically like the approximation phrases containing N-men in (93b) and semantically like it as well in (96), as in (100).

(99) a. $^*\text{san-ge xuesheng-men}$  
\text{three-Cl student-MEN}  
\text{Intended: 'three students'}  

b. 
\begin{align*}  
\text{NumP} & \quad \text{ClP}  
\text{san} & \quad \text{Cl'}  
\text{'three'} & \quad \text{AssPlP}  
\text{ge} & \quad \text{N}  
\text{men} & \quad \text{'student'}  
\end{align*}  

\begin{align*}  
c. [\text{[ge]}] & = \lambda k \lambda x [\text{AT}(\text{\`k})(x)] <e^k, <e, t>>  
d. [\text{[xuesheng-men]}] & = \lambda Y [\text{\`STUDENT} \land |Y| \geq 2 \land \text{G(STUDENT)} = Y] <e, t>  
e. [\text{[ge xuesheng-men]}] & = ?? \text{uninterpretable}  
\end{align*}

(100) a. $^*\text{san-ge xuesheng-men}$  
\text{three-Cl student-MEN}  
\text{Intended: 'three students'}
The reason is not difficult to justify. When one provides an estimated numerical value, it presupposes that one is uncertain about or not aware of what the specific numerical value is; when a speaker utters a specific small number like san 'three', it convey the information that the speaker is aware of the specific numerical value; this renders a context of vague estimation unnecessary and impossible (100d).

Now let us analyze the structure and semantics of the last type of phrases containing -men, [N-men Num Cl (person)].

3.6.4 The appositive phrase containing -men [N-men Num Cl (person)]

As discussed in Section 3.4.1, [N-men Num Cl (person)] is an appositive nominal phrase in which the numeral-classifier servers as a non-restrictive modifier to N-men. I repeated the properties of this phrase in (101), with three examples repeated in (102).

(101)  
   i. a noun denoting ‘person’ can optionally appear after the classifier  
   ii. -men is obligatory  
   iii. [N-men Num Cl] is interpreted as definites  
   iv. the numeral provides additional descriptive information to N-men; the numeral information provided by the numeral should be the total/maximal number of the group

(102)  
   a. wo qing XiaoQiang*(-men) san ge (ren) chifan.  
   I invite XiaoQiang-MEN three Cl person eat  
   ‘I invited XiaoQiang and two others (in the group) for a meal.’
   b. wo qing ta*(-men) san ge (haizi) chifan.  
   I invite he-MEN three Cl (child) eat  
   ‘I invited them three-Cl (children) for a meal’
   c. ba hai-zi men san ge (ren) jiao xia lai chi wan-fan.  
   BA child-MEN three Cl person ask down come eat late-meal  
   ‘Go to ask the kids, three of them, to come downstairs to have dinner.’

Concerning the structure of [N-men Num Cl (person)], I propose a left-adjunction analysis based on del Gobbo’s (1999). In del Gobbo (1999), she proposes the adjunction structure in (85a) for nominal appositives in Mandarin like the ones in (103b, c).
The examples in (103b, c) are very much like the ones in (102). Based on the left-adjunction structure in (103a), I propose that the structure of appositive nominals \([N\text{-}men \text{ Num Cl (person)}]\) in (102) is the one below.

\[
\begin{align*}
\text{(104)} & \quad \text{AssPlP} \quad \text{AssPlP} \quad \text{ClP} \\
& \quad \text{XiaoQiang-men} \quad \text{ni-men} \quad \text{haizi-men} \\
& \quad \text{numeral} \quad \text{person} \quad \text{the children'} \\
& \quad \text{2pl} \quad \text{three} \quad \text{ge} \quad \text{(ren)} \\
& \quad \text{'the children'} \quad \text{Cl} \quad \text{NP} \\
& \quad \text{NP} \quad \text{Cl'} \quad \text{ren} \quad \text{'person'}
\end{align*}
\]

Note that, the merge between the AssPlP and the ClP should be formed via external merge rather than internal merge given that a noun denoting ‘person’ can appear in the position following the classifier (i.e. N-men is unlikely to undergone movement from within the [Num CL (person)] phrase). When the noun ren ‘person’ is absent, I assume that it is a phonetically null form which still presents in the syntax.

With regard to the semantics of the nominal appositive \([N\text{-}men \text{ Num Cl (person)}]\), I now can only provide a very rough analysis of it. I propose that the nominal appositive can be treated as an appositive function which apposes a property expressed by the numeral-classifier to a plural individual denoted by N-men; it takes an entity and returns an entity, as illustrated in (105).

\[
\text{(105)} \quad \text{APP(P)(x)= x if P(x), else undefined}
\]

The proposed analysis of the appositive \([N\text{-}men \text{ Num Cl (person)}]\) phrase allows us to understand why -men is obligatory in this phrase. When the numeral is larger than ‘one’, the numeral construction requires a plural individual. When -men is present, N-men denotes a unique plural individual, but when -men is absent, bare pronouns (e.g. ni '2sg')
and bare proper names (e.g. XiaoQiang) are singular, and bare nouns are number-neutral, all of which cannot satisfy the plural requirement imposed by the numeral.

Last, let us return to the unacceptable sentence in (19c) (Section 3.3.1), as repeated in (106)).

\[(106) \text{?/*wo qing pengyou-men sange (ren) chifan.} \]
\[\text{I invite friend-MEN three-Cl person eat} \]
\[\text{‘I invited three friends for a meal.’} \]

Normally, the total/maximal number of members in the group of one’s friends is very unlike to be just ‘three’ especially when no context is provided. A conjecture about the reason why (106) is unacceptable is that the semantic requirement of this construction is not met. That is to say, if we restrict the domain of the -men marked group in (106) to the extent that we can provide a plausible number to describe the total/maximal number of its members, this sentence should be improved. This prediction is borne out:

\[(107) (?) \text{wo qing } [zu li de pengyou-men] shi-ge (ren) chifan. \]
\[\text{I invite team in De friend-MEN ten-Cl person eat} \]
\[\text{‘I invited the friends in the team, ten of them, for a meal.’} \]

In Section 3.5, I analyzed -men as an associative plural whose function is to map a human kind to a salient group, type \(e^k, e_t\) and proposed an associative plural projection closer to the noun and below the classifier phrase. We saw in this section that the properties of the four types of phrases containing -men noted in Section 3.3 and Section 3.4, i.e. (i) N-men, (ii) [Num Cl\text{group N-men}], (iii) [Num-Approximation Cl N-men] and (iv) [N-men Num Cl (person)], are amenable to the proposed analysis of -men within well-established principles of interpretation in the Neocarlsonian approach to bare nominals. More importantly, the proposed analysis of -men showed that it is not necessary to assume a functional category D that is always invisible in the grammar of Mandarin in order to account for the properties of nominals containing -men. Such an analysis of -men provides further arguments for the D-less analysis of nominal arguments in Mandarin. In the next section, I will discuss two issues about N-men that remain in need of future exploration.

### 3.7 Remaining Issues

In this final subsection, I will discuss two issues regarding N-men that remain in need of further explorations. The first one is that N-men seems to ‘block’ bare human nouns from freely anaphorically refer to a plural individual.

In Mandarin, bare human nouns cannot freely anaphorically refer to a plural individual (108a), but-men marked nouns can (108b).\[1\]

\[1\] As is well known, bare nouns in Mandarin can freely refer anaphorically to a singular individual:

\[\text{i) jiaoshi li zuo zhe yi ge nan-hai he yi ge nv-hai, nan-hai kan qi lai you 14 sui.} \]
Classroom inside sit Prog one Cl boy and one Cl girl, boy look have 14 year
‘There is a boy and a girl sitting in the classroom, the boy looks like a 14-year old’
Plurals and complex nominal arguments in Mandarin

(108)  a. women ban you shi ge nansheng er-shi ge nvsheng, our class have ten Cl boy twenty Cl girl
# nansheng shi cong nanfang lai de.
boy be from south come De
b. women ban you shi ge nansheng er-shi ge nvsheng, our class have ten Cl boy twenty Cl girl
nansheng-men shi cong nanfang lai de.
Boy-MEN be from south come De
‘There are thirty boys and twenty girls in our class. The boys are from the south.

To make (108a) acceptable, three strategies could be employed: (i) to place dou ‘all’ in the sentence containing the bare noun (108a),\(^{13}\) (ii) to use zhe xie ‘Demonstrative xie’ with the bare noun (108b); and (iii) to provide a contrastive context (108c). In addition, any combination of the above three strategies can also make (108a) acceptable..

(109)  a. women ban you shi ge nansheng er-shi ge nvsheng, our class have ten Cl boy twenty Cl girl
nansheng dou shi cong nanfang lai de.
boy Dou be from south come De
‘There are thirty boys and twenty girls in our class. The boys are all from the south.
b. women ban you shi ge nansheng er-shi ge nvsheng, our class have ten Cl boy twenty Cl girl
na xie nansheng shi cong nanfang lai de.
that Xie boy be from south come De
‘There are thirty boys and twenty girls in our class. Those boys are from the south.
c. women ban you shi ge nansheng er-shi ge nvsheng, our class have ten Cl boy twenty Cl girl
nansheng shi cong nanfang lai de, nvsheng shi cong beifang lai de.
boy be from south come De, girl be from north come De
‘There are thirty boys and twenty girls in our class. The boys are from the south, and the girls are from the north.

Unlike human bare nouns, non-human animate bare nouns and inanimate bare nouns can freely anaphorically refer to either a singular individual or a plural individual in a unrestricted way, as illustrated in (110) and (111) respectively.

(110)  a. wo jia you yi zhi wu-gui he yi tiao jinyu.
I family have one Cl turtle and one Cl goldfish
wu-gui zaoshang yiban bu zenme chi dongxi.
Turtle morning usually not how eat things
‘My family has one turtle and one goldfish. The turtle usually does not eat that

\(^{13}\) See D. Liao (2011) for a recent discussion of Mandarin dou and related references.
much in the morning.’

b. *Wo jia you shi zhi wu-gui he wu tiao jinyu.
   I family have ten Cl turtle and five Cl goldfish
   *Wu-gui zaoshang bu zenme chi dongxi.
   Turtle morning not how eat things
   ‘My family has ten turtles and five goldfish. The turtles usually do not eat that much in the morning.’

(111) a. *Wo you yi ba yizi he yi zhang zhuozi.
   I have one Cl chair and one Cl desk.
   *Zhuozi shi cong deguo jinkou de.
   Desk is from Germany import De.
   ‘I have one chair and one desk. The desk was imported from Germany.’

b. *Wo you shi ba yizi he shi zhang zhuozi.
   I have ten Cl chair and ten Cl desk.
   *Zhuozi shi cong deguo jinkou de.
   Desk is from Germany import De.
   ‘I have ten chairs and ten desks. The desks were imported from Germany.’

The above phenomenon is not unique to Mandarin; it is also attested in Japanese and Korean as observed in Nemoto (2005: 398). In these two languages, animate (human in particular) bare human nouns also cannot refer anaphorically to a plural individual unless they are assisted by a plural element similar to -men or other means, whereas non-human bare nouns do not have such a restriction.

I now do not have an explanation to the above phenomenon and need to leave it for future research. The second issue that I also do not have an explanation to is why N-men cannot serve as predicates, as we saw in (42a) (Section 3.4.2), as repeated in (112).

(112) a. *Tamen shi laoshi(*-men)
   they be teacher-MEN
   ‘They are teachers.’

In my proposed analysis of N-men in Section 3.6.1, I treat N-men as property-denoting which is turned into an argument via semantic type-shifting operations. A question that immediately arises is why N-men cannot serve in the predicate position if it is property-denoting. This puzzle would still exist if one chooses a null DP analysis of N-men since one may as well wonder why the N-men that a null D combines with cannot occur in the predicate position.

3.8 Summary

This chapter examined nominal arguments containing -men, a morpheme that has been used to argue for the existence of DP projections in Mandarin. I reviewed three views of -men that have been proposed in the literature and support the view that -men is a plural marker as first argued in A. Li (1999); however I argue against the analysis of placing -men in the D position or treating it as a definite determiner. I showed three challenges for
the DP analysis of -men. First, -men is compatible with numeral classifier phrases when the classifier is a group classifier [Num Cl_{group} N-men] (c.f. (24)/(25)). Such a fact showed that the [N-men] phrase is not the equivalence of definite plurals in English (e.g. *two groups of the kids) and that -men should be in a position lower than the numeral and the classifier and local to the noun. More importantly, the [Num Cl_{group} N-men] phrase showed that the presence of a classifier does not prevent nouns from combining with -men. Second, -men is compatible with numeral classifier phrases even when the classifier is an individual classifier; however the numeral needs to express approximation [Num-Approximation Cl_{individual} N-men] (c.f. (29b)/(30)). The [Num-Approximation Cl_{individual} N-men] phrase further showed that the presence of the individual classifier is not a factor that prevents nouns from combing with -men. Third, I showed that common nouns are not completely banned in the position preceding the numeral-classifier [N-men Num Cl] (c.f. (34)). Such a fact also showed that the presence of the individual classifier is not an intervener for combining nouns with -men. Finally, we saw the properties of the two types of phrases containing -men, i.e. the [N-men Num Cl] phrase and N-men, which are less commonly addressed in the literature. The [N-men Num Cl] phrase, which is non-restrictive, differs greatly from the [Num Cl N] phrase, which is restrictive, syntactically and semantically. The [N-men] can receive a generic reading, in addition to the well-known definite reading.

To account for the co-occurrence of -men and the classifier and the properties of the four types of nominal phrases containing -men, I proposed an analysis of -men as associative plural and an associative plural projection AssPlP closer to the noun and lower than the classifier head Cl, building on the split analysis of plurality (e.g. Wiltschko 2008; Kramer 2009, 2010, 2016; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zareikar 2015). The proposed analysis of -men together with the D-less analysis of bare arguments in Mandarin developed in Chapter 2, as we saw, account for the properties of the four types of phrases containing -men in a coherently principled manner. The formal account for the syntax and semantics of phrases containing -men in this chapter showed that it is not necessary to assume a functional category D that is always invisible in the grammar of Mandarin in order to account for the behaviors of nominal arguments containing -men, providing further evidence for the lack of DP in Mandarin.

Chapter 4 moves on to the discussion of a typologically very rare classifier language that, unlike Mandarin, does have overt article determiners.
Part II

A Classifier Language with D: Nuosu Yi
Chapter 4

A Classifier language with Ds: Nuosu Yi

4.1 Introduction

Chapters 2 and 3 offered a detailed account of the syntax and semantics of nominal phrases in Mandarin, a classifier language without evidence of overt determiners. The overarching goal of the two chapters was to argue for a D-less analysis of nominal arguments in Mandarin and a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b). Specifically, it was argued, contrary to previous analyses, that it is not necessary to assume a functional category D that is always invisible in Mandarin in order to account for the behavior of nominals in this language. This is arguably a simpler analysis of Mandarin nominal phrases since it avoids stipulating the presence of invisible projections that otherwise have no overt manifestation in this language.

The present chapter examines nominal argument formation in Nuosu Yi, a language that is typologically unusual in having classifiers as well as a definite determiner. Also unusual is the fact that demonstratives do not combine directly with nouns in this language but require the mediation of classifiers. Properties such as these are shown to pose a challenge to the accounts of nominal argument formation developed in Chapter 2. In particular, Nuosu Yi facts are in direct conflict with the proposal made in Chierchia (1998b) where it is claimed that classifier languages do not have overt article determiners. Chierchia (1998b) explains the absence of definite articles in classifier languages as resulting from considerations of economy: if nouns in classifier languages are names of kinds, they can occur directly as arguments of verbs, thereby obviating the need for extra structure to host a determiner. The data from Nuosu Yi alters the empirical generalization and calls for a modification of the explanation.

As we will see, the modification of Chierchia's framework together with the analysis of numerals, classifiers and bare nouns developed in Chapter 2 straightforwardly derive the behavior of nominal arguments in Nuosu Yi. The empirical adequacy of the analysis in Chapter 2 is substantiated by the fact that it can account not only for classifier languages without Ds, but also for those that do have them.

I begin this chapter by presenting the key features of argument formation in Nuosu Yi. The goal of Sections 4.2—4.6 is to show that Nuosu Yi is a classifier language which has several of the familiar properties of classifier languages common to this region. At the same time, there are a few crucial respects in which it is different. This makes Nuosu Yi typologically interesting. The theoretical challenge posed by the data presented in Sections 4.2—4.6 will be taken up in Section 4.7 and Section 4.8.
4.2 Nuosu Yi as a classifier language

Nuosu Yi is one of the Yi languages spoken in southern Sichuan and northern Yunnan, China. Yi belongs to the Tibeto-Berman branch within the Sino-Tibetan family (Benedict 1972; Bradley 1997, Sun 1998; Matisoff 2003). The standard as well as the best preserved Yi language is its northern branch, which is referred to as Nuosu Yi (Hu 2002, Gerner 2013). Nuosu Yi is a head final language (Bradley 1990; Fu 1997; Chen and Wu 1998; Hu 2002; Walters 2010; Liu and Gu 2011; Jiang and Hu 2010a; Jiang 2012; Gerner 2013). Most data from Nuosu Yi in this book was collected from my collaborative work with Suhua Hu, a native speaker of Nuosu Yi, from Fall 2009 to Fall 2014 and my consultant work with two native Nuosu Yi speakers from Summer 2015 to Fall 2015. Data from the literature will be duly noted. The goal of this section is to show that Nuosu Yi is a classifier language which has several of the familiar properties of classifier languages common to this region.

Nuosu Yi is a language that requires classifiers to mediate between numerals and nouns in numeral construction, as shown in (1).  

(1)  

<table>
<thead>
<tr>
<th>a. nga si-hni   nvip *(ma) mo ox.</th>
<th>I girl two Cl see ASP</th>
</tr>
</thead>
<tbody>
<tr>
<td>I saw two girls.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>b. cyx mu  nyip *(ma) shep bo ox.</th>
<th>3sg horse two Cl look-f for go ASP</th>
</tr>
</thead>
<tbody>
<tr>
<td>'He/She went to look for two horses.'</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>c. yy-gge nyip *(bix) adi jjo.</th>
<th>water two cup there have</th>
</tr>
</thead>
<tbody>
<tr>
<td>'There are two cups of water over there.'</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>d. viex-vie tshi/nyip/suo *(pu)</th>
<th>flower one/two/three Cl</th>
</tr>
</thead>
<tbody>
<tr>
<td>'one/two/three flower(s)'</td>
<td></td>
</tr>
</tbody>
</table>

The nouns *si-hni* 'girl' and *mu* ‘horse’ in (1a-b) are notional count but pattern with notional mass nouns like *yy-gge* ‘water’ in (1c) with respect to the inability to combine directly with numerals. It is safe to conclude from this paradigm that Nuosu Yi is a classifier language, like Mandarin or Japanese. It is therefore unsurprising that it should display many of the same properties. For example, the noun does not change form regardless of whether the numeral is singular or plural, as can be seen from (1d). Note that numeral classifier phrases in Nuosu Yi are in the order [N-Numeral-Cl]. The order [Numeral-Cl-N] that Mandarin uses is unacceptable in Nuosu Yi:

---

1 There is an exception to this generalization: the disyllabic cardinal ŋu-tshi ‘fifty’ can directly combine with a noun without the presence of a classifier. Mandarin also has similar phenomenon which is regarded as the residue from Old Chinese. This usage is rather restricted in Modern spoken Yi. According to my informant, this might be a residue from Old Yi as well. We will treat cases like this as marginal in this thesis and leave for future research the question why certain disyllabic cardinals can allow optional classifiers.
Further evidence of the similarity between Nuosu Yi and better known classifier languages comes from an examination of bare nouns. Nuosu Yi bare nouns can freely serve as arguments, appearing with kind-level predicates, in generic/characterizing sentences, as well as in episodic statements (Hu 2012, Jiang 2012, 2018). The paradigm below fits in with the description of Mandarin in Yang (2001), as we saw in Chapter 2 (c.f. (144), Section 2.5.2).

(3)  
\[ \text{a. } \text{ko-lo gi ox.} \]  
\[ \text{dinosaur extinct ASP} \]  
\[ \text{`The dinosaur is extinct.'} \]  
\[ \text{b. } \text{si-hni njiet-ap-mip tat-xi.} \]  
\[ \text{woman diligent should} \]  
\[ \text{`Women should be diligent.'} \]  
\[ \text{c. nga ke mo ox.} \]  
\[ \text{I dog see ASP} \]  
\( \text{(i). `I saw a dog/dogs.'} \)  
\( \text{(ii). `I saw the dog(s).'} \)  

Note that in episodic statements like (3c), bare nouns have indefinite as well as definite readings. Taking their indefinite reading first, (4a) shows that they display the same scope properties as Mandarin bare nouns, and indeed kind-denoting bare nouns generally (Yang 2001, Dayal 2004). As discussed initially in Carlson (1977a, b), English kind-denoting bare nouns take obligatory narrow scope with respect to other operators, such as negation. (4a)-(4b) provide evidence of the obligatory narrow scope property of bare nouns in Nuosu Yi:

(4)  
\[ \text{a. nga ke ap-mo.} \]  
\[ \text{I dog not-see.} \]  
\( \text{(i) `I didn't see dogs.'} \)  
\( \neg > \exists \)  
\( \text{(ii) Not: `I didn't see certain dogs.'} \)  
\( \exists > \neg \)  
\[ \text{b. ne ssos-sse shyp ngop ddu ggep la go-li, nga khat ox.} \]  
\[ \text{you student bring my home hang-out come if, I happy } \]  
\[ \text{ASP} \]  
\( \text{(i) `If you bring students to hang out in my house, I will be happy.'} \)  
\( \text{if > } \exists \)  
\( \neg > \exists \)  
\( \text{(ii) Not: `If you bring certain students to hang out in my house, I will be happy.'} \)  
\( \exists > \neg \text{ if} \)  

The definite reading of Nuosu Yi bare nouns, noted in (3c), is also supported by a third reading of (4a), namely “I didn't see the dog(s),” as well as a third reading of (4b), namely “if you bring the students to hang out in my house, I will be happy,” where happiness is contingent on the totality of the contextually salient group of students being
present. It is further confirmed by examples like (5) where the bare noun in the second sentence is anaphorically linked to the girl introduced in the first sentence. Again, this is typical of classifier languages like Mandarin (Yang 2001), Japanese (Nemoto 2005) or Thai (Piriyawiboon 2010), to name a few:

(5) \(\text{si-hni ma sini sse-vo ma i-go nyi, si-hni jiy nra.}\)
girl Cl and boy Cl room sit, girl very beautiful
‘A girl and a boy are sitting in the room, the girl is very pretty.’

The same as other classifier languages, Nuosu Yi bare nouns are number neutral in general, as we can see in (3c). There is one case where the number information is sensitive: when human bare nouns are used anaphorically. In (5), the bare noun can refer to a singular individual, but when a plural individual is in the antecendent sentence, it cannot refer to that plural individual:

(6) \(\text{si-hni ggex sini sse-vo ggex i go nyi, #si-hni jiy nra.}^{2}\)
girl ggex and boy ggex house sit, girl very beautiful
Intended: ‘Some girls and some boys are sitting in the house, the girls are very pretty.

Such a number restriction does not transfer to non-human bare nouns. For example, \text{yi-zy} ‘chair’ and \text{zhuo-zy} ‘desk’ in (7) can refer anaphorically either to the singular entity in (7a) or the plural entity in (7b).

(7) a. nga \(\text{zhuop-zyr ma si-nip yi-zy ma vy-lo,}\)
I desk Cl and chair Cl bought
\text{yi-zy nex pu-guo, zhuo-zy nex pu-gge ap-jjy.}
chair Foc/Top expensive chair Foc/Top price cheap
‘I bought a desk and a chair. The chair is expensive but the desk is cheap.

b. nga \(\text{zhuop-zyr suo-ci ma si-nip yi-zy nyip-zi ma vy lo,}\)
I desk thirty Cl and chair twenty Cl bought
\text{yi-zy nex pu guo, zhuo-z y nex pu-gge ap-jjy.}
chair Foc/Top expensive chair Foc/Top price cheap
‘I bought thirty desks and twenty chairs. The chairs are expensive but the desks are cheap.

The above number sensitivity of Nuosu Yi human nouns in anaphoric use is not specific to Nuosu Yi; As discussed in Chapter 3 (Section 3.7), the same phenomenon has been observed in Japanese and Korean (Nemoto 2005) as well as in Mandarin.

Another similarity that Nuosu Yi shares with many other classifier languages lies in classifiers. There is a range of classifiers attested in Nuosu Yi. The classifiers \text{ma} in (1a, b) and \text{pu} in (1d) which combine with notional count nouns are individual classifiers

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\(^2\) In order to receive a definite plural interpretation in the anaphoric use in (17), an element expressing quantity \text{ggex} together with a definite expression (either \text{su} or a demonstrative) need to appear with the human bare noun. (I will discuss the morpheme \text{ggex} in section 4.3)
A classifier language with Ds: Nuosu Yi

(see Chapter 1 for the discussion on different kinds of classifiers). Individual classifiers in Nuosu Yi are also sensitive to animacy, shape, dimension and size of nouns (Gerner 2013: 66-75). Nuosu Yi, of course, has other types of nominal classifiers as well: (i) container classifiers, such as bix 'cup' in (1c), (ii) standard measure classifiers (e.g. 'pound’), (iii) group classifiers (e.g. ‘group’), and (iv) partitive classifiers (e.g. ‘layer’). In (3), I give some examples of each type of classifiers (see Gerner 2013 for a detailed description of each type of classifiers in Nuosu Yi).

(8) i. Container classifiers: bix 'cup', pip 'bottle', zhep 'bowl'......
   ii. Standard measure classifiers: shy 'liter', jip 'pound'......
   iii. Group classifiers: wo 'flock, herd, group', bbot 'group'......
   iv. Partitive classifiers: zip 'layer'......
   v. Individual classifiers:
      a. classifiers sensitive to animacy/shape/dimension/size of nouns:
         pu, zha, pot, ji, gu, jot, pit, hmo, bbot, nzy, tot, jjur......
      b. general classifiers: ma

As we saw in Chapter 1, such unit forming expressions in (8i-iv) are not specific to classifier languages and will not feature prominently in our discussion. Our primary focus here will be on ‘individual classifiers’.

One worth noting classifier in Nuosu Yi is the general one ma (8vb), which I have used for illustration in (1a, b). The general classifier ma can combine with a wide range of nouns, including notional mass nouns (Gerner 2013: 72):

(9) a. va-qip suo  ma
      egg three Cl 'three eggs'
   b. nyit-cy hxit   ma
      demon eight Cl 'eight demons'
   c. jiy nyip  ma
      copper two Cl sand 'two pieces of copper'
   d. hmyx-shy suo    ma
      three Cl 'three grains of sand' (Gerner 2013: 72-73)

The behavior of ma differs from the general classifier ge in Mandarin, which is applicable to notional count nouns (Chao 1968: 588; Norman 1988: 115):

(10) a. san  ge  jidan
       three Cl  egg 'three eggs'
   b. ba  ge mogui
       eight Cl  demon 'eight demons'
   c. *liang  ge  tong
       two Cl  copper
   d. *san  ge  sha
       three Cl  sand

---

3 In Gerner (2013: 66), Nuosu Yi classifiers are divided to eight types: animate sortal classifiers, inanimate sortal classifiers, small-range sortal classifiers, double nominal and verbal classifiers, collectivizers, partitioners and subclassifiers, measure words, and auto-classifiers. We follow Chao (1969: 584-620)'s classification of nominal classifiers in Mandarin and divide nominal classifiers in Nuosu Yi into the five types in (8).
Before I move on to some less expected properties of Nuosu Yi nominals, let me note that the series of tendentially universal properties of bare numeral containing phrases, as observed in Mandarin as well as number marking languages in Chapter 2 (Section 2.2), are also attested in Nuosu Yi. The next section will discuss these properties of Nuosu Yi bare numeral classifier phrases.

4.3 Bare numeral classifier phrases in Nuosu Yi

In Chapter 2, I showed that bare numeral containing phrases (in the form of *two boys* or *two Cl boy*) exhibit a list of remarkable cross-linguistic properties, as repeated below.

(11) Tendentially universal properties of bare numeral containing phrases:

i. Bare numeral containing phrases are systematically both predicative and argumental;

ii. in their argumental role, they are always indefinites (with peculiar scope behavior);

iii. in their predicative role, they act restrictors of definite determiners, demonstratives, and the generic operator.

iv. Properties i—iii are stable, regardless of whether a language has (overt) Ds or not and also regardless of whether a language is a number marking one or a classifier one.

In Nuosu Yi, its bare numeral classifier phrases also exhibit the same properties in (11). I will elaborate on them in turn. Let us start with the argumental use of bare numeral classifier phrases.

Bare numeral classifier phrases in Nuosu Yi can free appear in argument position, receiving an indefinite interpretation:

(12) a. *tsho suo ma dza dzu njuo.*
   person three Cl rice eat PROG
   ‘Three persons are having a meal.’

b. *nga zhuop-zyr suo ma vy-lo.*
   I desk three Cl bought
   ‘I bought three desks.’

The indefinite numeral classifier phrases in Nuosu Yi also exhibit the long-distance scope and island escape-ability:

(13) *ne ssox-sse nyip ma shyp ngop ddu ggep la go-li, nga khat ox.*
   you student two Cl bring my home hang-out come if, I happy SFP
   (i). ‘If you bring two students to hang out in my house, I will be happy.’
   (ii). ‘If you bring two certain students to hang out in my house, I will be happy.’

   if >two girls
   two girls > if
In (13), the numeral classifier phrase *ssox-sse nyip ma* ‘three students’ can either receive a wide scope reading out of the adjunct clause without violating island constraints or receive a narrow scope reading within the adjunct clause.

Numeral classifier phrases in Nuosu Yi do not receive a definite interpretation; they cannot be used anaphorically:

(14)  
\[
\begin{align*}
&\text{si-hni suo ma sin} i\ sse-vo suo ma i go nyi,} \\
&\quad \text{girl three Cl and boy three Cl house sit,} \\
&\quad [*\text{definite}] \\
&\quad \text{girl three Cl very beautiful} \\
\end{align*}
\]

Intended: ‘Three girls and three boys are sitting in the house; the three girls are very pretty.’

In order to make the sentence in (14) acceptable, two strategies can be employed. One is to add a demonstrative in the position following the noun and preceding the numeral (15a); the other is to add *su* in the final position of the numeral-classifier phrase (15b), a morpheme which I will argue in Section 4.5 to be a definite article in Nuosu Yi.

(15)  
\[
\begin{align*}
&a. &\text{si-hni suo ma sin} i\ sse-vo suo ma i go nyi,} \\
&\quad \text{girl three Cl and boy three Cl house sit,} \\
&\quad \text{si-hni a-zyx suo ma jjy nra.} \\
&\quad \text{girl that three Cl very beautiful} \\
&\quad \text{‘Three girls and three boys are sitting in the house; those three girls are very pretty.’} \\

&b. &\text{i-hni suo ma sin} i\ sse-vo suo ma i go nyi,} \\
&\quad \text{girl three Cl and boy three Cl house sit,} \\
&\quad \text{si-hni suo ma su jjy nra.} \\
&\quad \text{girl three Cl su very beautiful} \\
&\quad \text{‘Three girls and three boys are sitting in the house; those/three girls are very pretty.’} \\
\end{align*}
\]

In the above sentences in (15), the numeral classifier phrases are used as predicates, serving as the restrictors of the demonstrative/definite article (discussions on Nuosu Yi definite article and demonstratives will be provided in Section 4.5 and Section 4.6).

When numeral classifier phrases are predicative, they can also serve as the restrictors of the generic operator (16) or quantifiers (17):
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(16)  
a. *si-hni suo ma gaqip gur qy dox.  
girl three Cl piano Cl lift can  
'Three girls can lift a piano.'  
b. mu suo ma suo tu va bi.  
horse three Cl three thousand dollar give  
'Three horses cost three thousand dollars.'  
c. shur nyip ma ggot cyp ggat zip da ap hxit.  
pheasant two Cl closed one place put Asp NEG can  
'Two pheasants cannot be kept in the same place.'

(17) ssox-sse suo ma zzix ap zzi  
student three Cl every  
'every group of three students'

Last, Nuosu Yi numeral classifier phrases can appear in the predicate position:

(18) Aka sini Ako sse-vo nyip ma nge.  
Aka and Ako boy two Cl be  
'Aka and Ako are two boys.'

Before ending the discussion in this section, let me note one interesting behavior of the numeral classifier phrase [N one Cl]. In Nuosu Yi, [N one Cl] is restricted from occurring in episodic sentences of the sort in (19a); it also cannot appear in generic sentences like the one in (19b).

(19)  
a. ?? tsho tshi ma dza dzu njuo.  
person one Cl rice eat PROG  
Intended: ‘A person/One person is having a meal.’  
b.* a-nyie tshi ma a-hie yo yie.  
cat one Cl mouse catch should  
Intended: ‘A cat should catch mice.’

In order to express the intended meanings in (19a) and (19b), the numeral shi 'one' must be absent. The numeral-less classifier phrase [NP Cl] will be presented in Section 4.4.

But if it is used to address the numeral information of one, [N one Cl] then can freely occur in episodic sentences and generic sentences (Hu 2012):

(20)  
a. used with only  
tsho tshi ma ati adi ni.  
person one Cl only there sit  
‘Only one person is/was sitting there.’  
b. used in contrast with other numerals  
thu zi tshi po ati adi dzu, ni po dze agu ox.  
book one Cl only there-at have, two Cl not have SFP  
Lit: ‘There is only one book over there; there are not two.’ (Hu 2012).
When the numeral is larger than one, numeral classifier phrases can freely occur in both sentence initial positions and preverbal object positions, as we have seen in (12).

We have seen many respects in which Nuosu Yi is unexceptional in Section 4.2 and Section 4.3, but starting from next section, I present the unexpected properties of Nuosu Yi.

4.4 Numeral-less classifier phrases in Nuosu Yi

The first property specific to Nuosu Yi is about its numeral-less classifier phrases. As we saw in Chapter 1, numeral-less classifier phrases are not uncommon among classifier languages; however, this is a dimension along which classifier languages vary significantly (see Cheng and Sybesma 1999, 2005; Simpson 2005; Dayal 2010, 2012; Simpson et al 2011; Jiang and Hu 2010b; Jiang 2012, 2014; X. Li 2011, 2013). In Chapter 2, I showed that numeral-less classifier phrases in Mandarin are only allowed in restricted post-verbal positions, with an indefinite interpretation. Some examples are repeated below:

(21) a. *ge xuesheng yinggai haohao xuexi. (Mandarin)
   Cl student should good-good study
   Intended: ‘A/The student should study hard.’

b. *wo mai le zhi mao, tiao gou he zhi tuzi.
   I buy ASP Cl cat, Cl dog and Cl rabbit
   Intended: ‘I bought a/the cat, a/the dog and an/the rabbit.’

c. wo mai le zhi mao.
   I buy ASP Cl cat
   ‘I bought a cat.’

In other classifier languages, such as Cantonese and Bangla, numeral-less classifiers are freely allowed in both subject and object position, with a definite interpretation (see Cheng and Sybesma 1999; Simpson et al 2011; Dayal 2012, c.f. Chapter 1):

(22) a. bzek gau zungji sek juk. (Cantonese)
   CL dog like eat meat
   ‘The dog likes to eat meat.’

b. Ngo zungji tong zek gau waan.
   I like with CL dog play
   ‘I like to play with the dog.’ (Cheng and Sybesma 1999: 511)

(23) a. kEmera Ta khub dami. (Bangla)
   camera Cl very expensive
   ‘The camera was/is very expensive.’

b. Tumi ki alo Ta jele dite parbe please?
   you Q light Cl turn.on give can please
   ‘Can you turn on the light, please?’ (Simpson et al 2011: 170, 188)
In some classifier languages such as Southern Min, Japanese, Korean and Thai, numeral-less classifier phrases are simply disallowed (see Cheng and Sybesma 2005; Jenks 2011; Jiang 2012, 2014). Examples from Southern Min are provided below:

(24)  a. *jia gau be lim zhui.  
  (Southern Min)  
  Cl dog want drink water
  Intended: ‘The dog wants to drink water.’  
  b. *ua siuN bue bun zhu.  
  I want buy Cl book
  Intended: ‘I would like to buy a book.’ (Cheng and Sybesma 2005)

Nuosu Yi also allows numeral-less classifier phrases. Compared with numeral-less classifier phrases in other classifier languages, those in Nuosu Yi behave quite differently in that they are freely allowed in both subject and object positions, but with an *indefinite* interpretation (25a, b).

(25)  a. tsho ma dza dzu njuo.  
  [indefinite singular]  
  person Cl rice eat PROG  
  ‘A person is having a meal.’
  b. tshi mu ma shep bo ox.  
  3s horse Cl look-for go SFP  
  ‘He went to look for a horse.’
  c. ne ssox-sse ma shyp ngop ddu ggep la go-li, nga khat ox.  
  you student Cl bring my home hang-ou t come if, I happy ASP
  (i). ‘If you bring a certain student to hang out in my house, I will be happy.’  
  (ii). ‘If you bring a student to hang out in my house, I will be happy.’

In (25c), if the noun-classifier phrase ssox-sse ma 'a student' has wide scope over the *if*-clause (25ci), it refers to one specific student, and the sentence is interpreted as ‘there exists one specific student whose arrival to the party will make me happy’. In contrast, when 'a student' receives a narrow scope interpretation within the conditional clause (25cii), it refers to *any student* and this interpretation is nonspecific. Accordingly, we interpret the sentence as ‘the arrival of any student will be sufficient for me to be happy’.

When the classifier is an individual classifier, Nuosu Yi numeral-less classifier phrases are interpreted as singular, as can be seen in (25). For now, let us assume that there is a silent ‘one’ in these cases.

Nuosu Yi numeral-less CIPs cannot be interpreted as definite; they neither can be used anaphorically (26a) nor can they be used in conditional sentences to refer back to the nominal in the *if*-clause (26b).

(26)  a. si-hni ma sini sse-vo ma i go nyi,  
  girl Cl and boy Cl house sit,  
  *definite*  
  #si-hni ma jjy nra.  
  girl Cl very beautiful
  Intended: ‘A girl and a boy are sitting in the room; the girl is very pretty.’
b. *si-hni ma sini sse-vo ma jjy-qo zza zze bo go-ni,
   girl CL and boy CL dinner eat go conditional,
   *yi-ba sse-vo ma rre ddur.
   usually boy CL money pay
   Intended: ‘If a girl and a guy go out for dinner, usually the boy pays.’

Nuosu Yi numeral-less classifier phrases can appear in generic sentences, receiving a generic reading (27), but they resist kind level predicates and cannot receive a kind interpretation (28).

(27) a-nyie ma a-hie yo yie. [generic]
   cat CL mouse catch should
   ‘A cat should catch mice.’

(28) *ko-lo ma gi ox. [kind]
   dinosaur CL extinct SFP
   Intended: ‘Dinosaurs are extinct.’

The behavior of the numeral-less classifier phrases in Nuosu Yi [NP CL] behave like English singular indefinites [a/an NP]. Although [NP CL] in Nuosu Yi is interpreted as singular, if we replace the individual classifier with a morpheme ggex, which expresses quantity information (Jiang 2012; Gerner 2013), [NP ggex] can receive a plural interpretation as ‘some N, a number of N’ (Jiang 2012: 325-330, Gerner 2013:76). The contrast between [NP ggex] and [NP CL] is given below:

(29) a. indefinite plural  b. indefinite singular
    si-hni ggex   si-hni ma
    girl ggex     girl CLindividual
    ‘some girls/ a number of girls’ ‘a girl’

The morpheme ggex has been described as a collective classifier in Gerner (2013: 76), or one might regard it as a plural marker like the -s/es in English or a plural classifier. I suggest that ggex can be treated in a similar way as the morpheme xie in Mandarin, which has been treated as a partitive classifier and expresses a meaning of ‘a large quantity of N’ (e.g. Chao 1968; A. Li 1999; Jiang 2012). I consider two reasons. First, ggex cannot appear with numerals, as exemplified in (30a, b). The other is that ggex can be used with mass nouns (31) in addition to being used with count nouns.

(30) a. *si-hni suo ggex   
    girl three ggex

4 Note that in addition to Yi, another classifier language Zhuang has also been reported to allow bare CIPs with a generic reference (e.g. see Sio and Sybesma 2008; D. Liu 2010).

5 The morpheme xie in Mandarin has also been treated as a plural classifier (e.g. Cheng and Sybesma 1999) or a vague classifier (e.g. Liao 2011).
b. *si-hni tshi ggex
   girl one ggex

(31)  a. che ggex mux-dde go rrur.
   rice ggex ground LOC have
   ‘Some rice is on the ground.’
   b. (?) vy ggex mux-dde go rrur.
   water ggex ground LOC have
   ‘Some water is on the ground.’

The same as numeral-less individual classifier phrases, [N ggex] can appear in both
subject positions (32a) and object positions (32b) with an indefinite interpretation, but it
still cannot receive a kind interpretation or a definite interpretation, as shown in (33) and
(34).

(32)  [N-ggex]                                      [indefinite plural]
   a. si-hni ggex a-ddit bbop-la ox.
      girl ggex there come ASP
      ‘Some girls came from over there.’
   b. nga si-hni ggex tso.
      I girl ggex meet
      ‘I met some girls.’

(33)   *ko-lo ggex gi ox.
       dinosaur ggex extinct ASP
       Intended: ‘Dinosaurs are extinct.’

(34)   si-hni ggex sini sse-vo ggex i go nyi,
   girl ggex and boy ggex house sit,
   * si-hni ggex jiy nra.                      [*definite]
   girl ggex very beautiful
   Intended: ‘Some girls and some boys are sitting in the house, those girls are very
   pretty.’

Having seen the first specific property concerning numeral-less classifier phrases of
Nuosu Yi, the next section will show a more surprising property of this language.

4.5   The unexpected definite article

Typically, languages in which bare nouns have definite readings do not have overt
definite articles. This is as true of classifier languages like Mandarin or Bangla as it is of
non-classifier languages like Hindi or Russian (Dayal 2004, 2012, 2014). Languages with
overt definite articles like English only allow indefinite readings for bare plurals. We
have seen that bare nouns in Nuosu Yi have definite readings, but as we will see, Nuosu
Yi also has a morpheme *su*, which has been noted to contribute definiteness (Chen 1989; Hu 2002, 2012; Jiang and Hu 2010a; Liu and Gu 2011; Jiang 2012; Gerner 2013). The particle *su* appears in the final position in the nominal classifier domain and turns indefinite numeral classifier phrases into definites:

\[(35)\]

a. cyx mu suo ma shep bo ox.
   3sg horse three Cl look-for go ASP
   'He/She went to look for three horses.'
   
b. mu suo ma su nra jjy nra.
   horse three Cl Su fat very fat
   'The three horses are very fat.'

(Jiang and Hu 2010a)

In (35a), the phrase *mu suo ma* 'three horses' is mentioned for the first time in the discourse. In contrast, the *su*-phrase *mu suo ma su* 'the three horses' in (35b) refers to some salient objects familiar to the hearer. The *su*-phrase is not exchangeable for the indefinite numeral classifier phrase. That is, if three horses are already under discussion, (35a) cannot be used. Conversely, in a situation in which three horses are unfamiliar to the hearer, the sentence in (35b) is infelicitous.

The particle *su* has the same effect in the context of numeral-less classifier phrases. Consider the following, where (36a) has a singular indefinite reading, while (36b) has a singular definite reading.

\[(36)\]

a. tsho ma dza dzu njuo.
   man Cl rice eat PROG
   'A man is having a meal.'
   
b. tsho ma su dza dzu njuo.
   man Cl Su rice eat PROG
   'The man is having a meal.'

(Jiang and Hu 2010a)

As before, (36a) is infelicitous if there is already a man under discussion; (36b) is infelicitous if there is no man salient in the context.

*Su*-phrases also yield uniqueness and maximality effect, the typical characteristics of definites (e.g. Hawkins 1978, Lewis 1979, Heim 1982, Kadmon 1990). Felicitous use of *su*-phrases requires that the referent of the *su*-phrases is uniquely identifiable to the hearer. In (37), the *su*-phrases can be used anaphorically to refer to the unique individual in the antecedent clause, much like definites in English.

\[(37)\]

girl Cl and boy Cl room sit, girl Cl Su very beautiful
   'A girl and a boy are sitting in the room; the girl is very pretty.'

---

6 The origin of the morpheme *su* is the noun 'person' in Nuosu Yi (Dai and Hu 1999; Hu 2002; Gerner 2013). In addition to appearing in the nominal domain, *su* can also appear in the clausal domain with various uses. When *su* appears in the clausal domain, *su* has been claimed to be a topic marker (Chen 1985; Hu 2002), a nominalizer/complementizer (Jiang and Hu 2010a; Liu and Gu 2011; Gerner 2013), or a gerundive marker (Liu and Gu 2011). Discussions of the grammaticalization of *su* can be found in Dai and Hu (1999), Kokado (2000), Hu (2002), Hu and Jiang (2010), and Liu and Gu (2011).
The following examples establish the maximality presuppositions of \( su \) phrases explicitly:

\[
\begin{align*}
(38) & \\
& \text{a. } \text{si-hni nyip ma sini sse-vo ma i-go nyi, si-hni nyip ma } \text{su jiy } \text{nra.} \\
& \quad \text{girl two Cl and boy Cl room sit, girl two Cl Su very beautiful} \\
& \quad \text{‘Two girls and a boy are sitting in the room; the two girls are very pretty.’} \\
& \text{b. } \# \text{si-hni nyip ma sini sse-vo ma i-go nyi, si-hni ma } \text{su jiy } \text{nra.} \\
& \quad \text{girl two Cl and boy Cl room sit, girl Cl Su very beautiful} \\
& \quad \text{‘#Two girls and a boy are sitting in the room; the girl is very pretty.’}
\end{align*}
\]

In (38), the first half of these sentences establishes the existence of a set of girls and a set of boys. The \( su \)-phrase can refer to the maximal individual made of two girls but not a part of it.

One may wonder, of course, whether \( su \) phrases are demonstrative phrases since definiteness is expressible in all classifier languages through demonstratives. We see below that Nuosu Yi has distinct demonstrative expressions which occur immediately to the right of the noun and to the left of classifiers. The following tests in (39), as first proposed by Löbner (1985) for English and further adopted by Dayal (2004) for languages that freely allow bare nouns, show that \( cyx \) and \( a-zzyx \) are demonstratives while \( su \) is a definite article.

\[
\begin{align*}
(39) & \\
& \text{a. } \text{nga si-hni cyx/a-zzyx ma hxie-vur, si-hni cyx/a-zzyx ma hxie-ap-vur.} \\
& \quad \text{I this/that Cl like girl this/that Cl like-not} \\
& \quad \text{‘I like this/that girl but don’t like this/that girl.’} \\
& \text{b. } \# \text{nga si-hni ma su hxie-vur, si-hni ma su hxie-ap-vur.} \\
& \quad \text{I Cl Su like girl Cl Su like-not} \\
& \quad \text{‘#I like the girl but don’t like the girl.’}
\end{align*}
\]

Based on the above, we can conclude that Nuosu Yi is unusual in allowing definiteness to be expressed both by bare nouns and through the use of a definite determiner:

\[
\begin{align*}
(40) & \\
& \text{a. } \text{si-hni ma sini sse-vo ma i-go nyi, si-hni jiy nra.} \\
& \quad \text{girl Cl and boy Cl room sit, girl very beautiful} \\
& \quad \text{‘A girl and a boy are sitting in the room, the girl is very pretty.’} \\
& \text{b. } \text{si-hni ma sini sse-vo ma i-go nyi, si-hni ma su jiy nra.} \\
& \quad \text{girl Cl and boy Cl room sit, girl Cl Su very beautiful} \\
& \quad \text{‘A girl and a boy are sitting in the room, the girl is very pretty.’}
\end{align*}
\]

Before concluding this section, a few other properties of \( su \)-phrases are worth noting. Let us first consider sentences where the plural-like morpheme \( ggex \) appears in the same position as classifiers. In Section 4.4, we saw that the addition of this morpheme leads to an indefinite plural interpretation. One example is repeated in (41). Now, when \( su \) is added, as in (42a), it leads to a definite plural interpretation, not a generic interpretation (42b) or a kind interpretation (42c). That is, the situation is parallel to English plural definites:
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(41) \textit{si-hni gge\textsubscript{x}} \textit{sini sse-vo gge\textsubscript{x}} \textit{i go nyi}, \\
girl gge\textsubscript{x} and boy gge\textsubscript{x} house sit, \\
* \textit{si-hni gge\textsubscript{x}} \textit{jjy nra}. \\
girl gge\textsubscript{x} very beautiful \\
Intended: ‘Some girls and some boys are sitting in the house, those girls are very pretty.’

(42) a. \textit{si-hni gge\textsubscript{x}} \textit{sini sse-vo gge\textsubscript{x}} \textit{i-go nyi}, \textit{si-hni gge\textsubscript{x}} \textit{su jjy nra}. \\
girl Cl and boy Cl room sit girl Cl Su very beautiful \\
'Some girls and some boys are sitting in the room; the girls are very beautiful.' \\
b. \textit{a-nyie gge\textsubscript{x} su a-hie yo yie}. \\
cat Cl Su mouse catch should \\
'The cats should catch mice.' \\
Not: ‘Cats should catch mice.’ \\
c. *\textit{ko-lo gge\textsubscript{x} su gi ox}. \\
dinosaur Cl Su extinct SFP \\
Intended: ‘Dinosaurs are extinct.’

The incompatibility of \textit{su} phrases and genericity transfers over to the singular. And in this, it differs from English which does allow kind/generic readings for the definite singular (e.g. Krifka et al 1995; Dayal 2004):

(43) a. \textit{ke ma su mit te-go vo}. \\
dog Cl Su hungry when bark \\
'The dog (a particular one) barks when it is hungry.' \\
Not: ‘The dog (in general) barks when it is hungry.’ \\
b. *\textit{ko-lo ma su gi ox}. \\
dinosaur Cl Su extinct SFP \\
Intended: ‘The dinosaur is extinct.’

A final interesting property of \textit{su} phrases is that they cannot combine directly with bare nouns (Jiang and Hu 2010a; Jiang 2012; Gerner 2013), as shown by (44), where there is no classifier or plural morpheme intervening between them. The other word order \textit{su si-hni 'su girl} is also unacceptable:

(44) *\textit{si-hni su jjy nra}. \\
girl Su very beautiful \\
(Jiang and Hu 2010a)

One possibility worth addressing is that \textit{su} could be a case marker that contributes definiteness in the same way that the accusative case is known to do in many languages (Comrie 1981: 132; Enç1991: 4). So far we have seen \textit{su} combining with nouns in subject and object positions. The following shows that it can co-occur with overt oblique case markers, suggesting that it cannot be a case marker:
Based on the data discussed here, then, I take Nuosu Yi to be a classifier language that allows definite readings for bare nouns while also having a genuine definite determiner.

4.6 Demonstratives in Nuosu Yi

Classifier languages may not have overt determiners but they are known to have demonstratives, and we saw that Nuosu Yi does too. Nuosu Yi demonstratives were shown to occur in a different position from the definite determiner (15). More examples are provided below.

(46) a. *tsho cyx/a-zzyx nyip ma  
    man this/that two Cl  
    'these/those two men'  
b. tsho nyip ma su  
    man two Cl Su  
    'the two men'  
c. *tsho cyx/a-zzyx ma  
    man this/that Cl  
    'this/that man'  
d. tsho ma su  
    man Cl Su  
    'the man'

When the numeral is one, it must be absent from the demonstrative phrases as well as the su-phrases:

(47) a. *si-hni cyx/a-zzyx (*tshi) ma jjy nra.  
    girl this/that one Cl very beautiful  
    'That/this girl is very beautiful.'  
b. si-hni (*tshi) ma su dzi ndza.  
    girl one Cl Su very beautiful  
    'The girl is very beautiful.'

The ungrammaticality in (47) is analogous to the similar phenomenon in English: *this/that one book and *the one book.

There are two further properties of demonstratives that are worth noting. The first is not altogether surprising. Demonstratives and the definite article cannot co-occur in Nuosu Yi:
More surprising, however, is the fact that Nuosu Yi does not allow demonstratives to combine directly with nouns:

(49)  
\[
\text{tsho cyx/a-zzyx nyip ma su} \\
\text{man this/that two Cl Su} \\
\text{Intended: these/those two men'}
\]

b.  
\[
\text{tsho cyx/a-zzyx ma su} \\
\text{man this/that Cl Su} \\
\text{Intended: this/that man'}
\]

This contrasts with the well-known pattern seen in Mandarin, for example (Chao 1968; Tang 1990, 2007; A. Li 1999; Cheng and Sybesma 1999, 2014; Yang 2001, Wang 2005; H. Yang 2005; X. Li 2011, 2013, among others). I repeat the examples from Chapter 2 (Section 2.5.4) in (50).

(50) a.  
\[
\text{zhe shu shi xie gei niang-er-men-er kan de.} \\
\text{this book is write give women-folk read De} \\
\text{This book was written for womenfolk to read.' (Chao 1968: 510)}
\]

b.  
\[
\text{zhe/nan ren} \\
\text{this/that person} \\
\text{this/that person'} \\
\text{(A. Li 1999: 96, fn 25)}
\]

c.  
\[
\text{na chezhan hen yuan}. \\
\text{that station very far} \\
\text{That station is very far.' / Not: Those stations are very far.'} \\
\text{(from Academia Sinica Balanced Corpus of Modern Chinese 2004)} \\
\text{(H. Yang 2005: 65)}
\]

As discussed in Chapter 2, the pattern in Mandarin is representative of classifier languages generally. The need for a classifier to mediate between a noun and a demonstrative has also been previously noted for Burmese-Yipho languages in general (Xu 2001: 205), Cantonese (Matthews and Yip 2011: 107), Wu (X. Li 2011: 6, fn 3) and Southern Min (Tang 2007: 980). The facts of Nuosu Yi raise the question of whether the requirement for a mediating expression in both forms — those with the definite determiner and those with the demonstrative — should have a common explanation.

We have seen that Nuosu Yi is a classifier language that is unexceptional in some respects: it has bare nouns that freely serve as arguments with kind/generic, narrow scope indefinite and definite readings; its bare nouns are number neutral, and its bare numeral classifier phrases exhibit the same list of cross-linguistic properties. We also saw that Nuosu Yi allows numeral-less classifier phrases with an indefinite reading in both subject and object position. However, Nuosu Yi differs from other classifier languages in also having an overt definite article. This is at odds with an observation in the literature that the presence of definite articles blocks the possibility of definite readings for bare nouns. We further saw that demonstratives and the definite article in Nuosu Yi both require the
mediation of a classifier. These Nuosu Yi facts immediately lead to one interesting question that is worth addressing: why are classifier languages with overt article determiners possible but so rare? I will address this question in Section 4.7, before providing an account for the properties of nominal arguments in Nuosu Yi in Section 4.8.

4.7 Why are classifier languages with overt Ds possible but so rare?

Before the discovery of the definite determiner *su* in Nuosu Yi, there was a widespread belief that classifier languages necessarily lack overt article determiners (e.g. Chierchia 1998b; Bošković 2014). If it is possible for a classifier language to have a determiner, the question that arises is why such languages should be so rare — so far Nuosu Yi is the only language of this kind that has been attested. In answering this question, we will also address the other novel property of Nuosu Yi, namely the requirement that demonstratives and the definite article in Nuosu Yi require the mediation of classifiers in order to combine with a noun.

Chierchia (1998b) speculates that classifier languages should not have article determiners. Since nouns in classifier languages are argumental, considerations of economy rule out the presence of a determiner. There is simply no functional pressure for article determiners to develop. Chierchia's speculation might well explain why overt Ds are so rare in classifier languages. Nevertheless, it cannot be the whole story since we have evidence to the contrary from Nuosu Yi. Furthermore, the logic of the framework itself foresees nominal structures that are predicative (type <e,t>), namely numeral and numeral-less classifier phrases. In principle, then, article Ds may well develop in such languages to turn such property-denoting phrases into arguments. This, together with the view that classifier languages lack functional pressure to develop a D, reconciles the existence of a classifier language like Nuosu Yi with the fact that it is unique among the classifier languages attested so far.

This modification of Chierchia’s proposal allows us to make two further predictions about classifier languages. It predicts that we will not find classifier languages with articles that do not also allow bare arguments. That is, it rules out a language which is like Nuosu Yi with respect to having classifiers, but like French or Italian with respect to disallowing bare arguments. This is so because bare nouns in classifier languages are inherently argumental and will always be allowed as bare arguments. To appreciate this point, consider the possibility that nouns in classifier languages may enter grammatical computation as properties. One might then expect that there ought to be classifier languages like French that always disallow bare arguments, or classifier languages like English that disallow notional count nouns to be arguments in their singular form. As far as we know, this does not happen in any classifier language, in keeping with the kind-based analysis of bare nouns in classifier languages.

A second prediction of the current approach is that any classifier language that develops overt article Ds will not allow that D to combine directly with bare nouns. This is because bare nouns are kind-denoting and D can only apply at the level of numeral classifier phrases or at the level of an intermediate projection between numeral CIPs and bare nouns that happens to be predicative.

In addition to the above two predictions, we further expect that classifier languages with overt article Ds should behave like Nuosu Yi and share the following
properties: their bare nouns should freely occur in argument positions, their numeral-classifier phrases should be both predicative and argumental and have an indefinite interpretation, and their Ds should not combine directly with bare nouns but should only apply at those higher nominal levels which are property denoting. It remains to be seen whether these predictions are borne out as classifier languages are investigated further.

I have shown above why a modification of Chierchia's approach is needed and how the modified framework explains the possibility as well as the rarity of overt Ds in classifier languages. I have also discussed some predictions about the role of classifiers in the formation of definite noun phrases in such languages. In the next section, I will illustrate how the analysis of numerals, classifiers and bare nominals developed in Chapter 2 together with the modification of Chierchia's approach account for the Nuosu Yi facts that we saw in Section 4.2 — 4.6.

4.8 A theory of Nuosu Yi nominal arguments

In this section, I explain the properties of Nuosu Yi with the proposed analysis of numerals, classifiers and bare nouns developed in Chapter 2. The goal here is to show that the fact that Nuosu Yi has an overt definite article does not force us to change anything about that analysis. In fact, the behavior of Nuosu Yi nominals, as we shall see, falls within the predictions of the proposed analysis of numerals, classifiers and bare nouns. The empirical adequacy of that analysis, thus, is substantiated by the fact that it can account not only for classifier languages without overt Ds, but also for those that do have them. Let us start with Nuosu Yi bare nouns.

4.8.1 Bare arguments in Nuosu Yi

The discussion in this section focuses on deriving the object level meanings of bare arguments in Nuosu Yi. Nuosu Yi bare nouns should behave like those in Mandarin according to the Neocarlsonian approach to bare nominals that I adopted in Chapter 2 (Section 2.5.3). This prediction is borne out. As we saw in Section 4.2, bare nouns in Nuosu Yi can freely appear in argument positions; they can be used with kind-level predicates to refer to kinds or be used in generic sentences to receive a generic interpretation; they can also be used in episodic sentences to receive either a narrow scope existential interpretation or a definite interpretation. Relevant examples are repeated below.

(51) a. ko-lo gi ox.
   dinosaur      extinct ASP
   ‘The dinosaur is extinct.’

b. si-hni njiert-ap-mip tat-xi.
   woman   diligent should
   ‘Women should be diligent.’

c. nga ke mo ox.  
   I    dog see ASP
   i. ‘I saw dogs.’
   ii. ‘I saw the dog(s).’
In the syntax, the bare nouns in these examples remain as an NP, as shown in (52). In (53), I illustrate how the different readings of bare nouns in Nuosu Yi in (51) are derived. This demonstration is a close analog of a similar demonstration for Mandarin given in Yang (2011) seen in Chapter 2 (Section 2.5.3).

(53)  a. (51a) = [[ko-lo gi ox]] = extinct (‘dinosaurs)
    b. (51b) = [[si-hni njiet-ap-mip tat-xi]] = Gen x, s [\^\women (x)] [diligent (x, s)]
    c. (51ci) = [[nga ke mo ox]] (via DKP) = \exists x [\^\womens x) ∧ see (I, x)]
    d. (51cii) = [[nga ke mo ox]] (via SR) = saw (I, \womans)

Given that bare nouns in classifier languages are kind-referring, they can take kind-level predicates directly (53a). In generic sentences (53b), the kind term provides the restriction for the generic operator Gen. To derive the existential reading in episodic statements, we apply Derived Kind Predication (DKP) (53c) (c.f. ex. (154) in Chapter 2). As an immediate consequence of this, we derive the obligatory narrow scope behavior we observed in (4) in Section 4.2.

Turning to the definite reading in (53d). This reading is also made possible in the Neocarlsonian approach that I have adopted in Chapter 2 and can derive from the kind reference via Situation Restriction (SR) (c.f. ex. (164) in Section 2.5.3). Of course, given that I have argued for the presence of a definite determiner in Nuosu Yi, this definite reading should be blocked, as it is in English (c.f. Chapter 2, Section 2.5.3) (54).

(54)  a. Some children came in. *(The) children were happy. (English)

In this section, we saw that the kind, generic, existential, and definite interpretations of bare nouns in Nuosu Yi are correctly predicted by the Neocarlsonian account of bare nominals that I have adopted in Chapter 2. I will now turn to the structure and the interpretation of numeral classifier phrases in Nuosu Yi.
4.8.2 Numeral classifier phrases in Nuosu Yi

The behavior of Nuosu Yi numeral-classifier phrases is consistent with our claim that Nuosu Yi bare nouns denote kinds. Bare numerals, as argued in Section 2.2.2 and Section 2.2.3 (in Chapter 2), are phrasal in the syntax and property-seeking functions in the semantics across languages. I further argued for a D-less structure of bare numeral-classifier-noun phrases across languages in Section 2.4.1, which I repeat in (55).

(55) a. the structure of argumental/predicative numeral-(classifier-) noun phrases

\[
\begin{array}{c}
\text{ClP} \\
\text{NumP} \\
\text{Cl} \\
\text{NP}
\end{array}
\]

b. Lexical view of ambiguous numerals

i. Numerals\langle e, t\rangle, \langle e,t\rangle = \lambda P \lambda x \ [n (x) \land P(x)]

ii. Numerals\langle e, e\rangle = \lambda P \exists (\lambda x \ [n (x) \land P(x)])

If \(\alpha\) is subject to existential closure at arbitrarily chosen scope sites.

Chapter 2 showed us that the analysis in (55) is sufficient to explain the uniform behavior of bare numeral-classifier-noun phrases in Mandarin and number marking languages at the clausal level without additional language specific assumptions. As we shall see, such an analysis can be easily extended to account for Nuosu Yi bare numeral classifier phrases that we saw in Section 4.2 and Section 4.3.

When numerals, which are property-seeking, combine with kind-referring nouns, a type-mismatch arises, preventing numerals from combining directly with nouns. The Neocarlsonian approach to bare nominals in classifier languages provides a natural account for the obligatory existence of classifiers, i.e. classifiers turn kind-referring nouns into properties so that the type-mismatch can be resolved (Chierchia 1998b; Krifka 1995, c.f. Chapter 2, Section 2.4.2.2). Some examples in (1) and (2) are repeated in (56).

(56) a. * si-hni nyip
    girl two

b. * nyip si-hni
    two girl

Intended: 'two girls'

Let us first look at the structure of numeral classifier phrases in Nuosu Yi. We observe that the word order is [NP Num Cl] in (57). I propose that this surface order is derived through movement of the NP from its base position in the structure [Num NP Cl] (58). I consider three reasons for the structure in (58). First, Nuosu Yi is a head final language (Bradley 1990; Fu 1997; Chen and Wu 1998; Hu 2002; Walters 2010; Liu and Gu 2011; Jiang and Hu 2010a; Jiang 2012; Gerner 2013). One may wonder whether Nuosu Yi can be head initial in the nominal domain. As we will see in Section 4.8.4, treating Nuosu Yi
as head final in nominal domains directly explains the fact that both the Cl and the D heads appear in the final position. Second, the NP movement seen above draws on Simpson (2005: 309-323), where such movement is used to explain cross-linguistic variation in the ordering of constituents in the classifier phrases of South East Asian languages. Third, bare numerals are phrasal in the syntax, as we argued in Chapter 2 (Section 2.2.2).

Turning to the semantics of the numeral classifier phrase. Let us first consider its predicative use, the analysis of which is shown in (59) above. The trace of the raised NP \( si-hni \) 'girl' in (58) is interpreted as an indexed variable of the type \( \langle e^k \rangle \). The raised NP meaning is lowered into the base position through lambda conversion. In (59), I treat numerals as predicate modifiers, and the numeral classifier phrase \( si-hni \ nyip \ ma \) 'two girls' receives a predicative meaning, type \( \langle e, t \rangle \).

\[
(59) \quad a. \ [\lbrack[ma]] = \lambda k \lambda x [\text{AT}(\lnot^k)(x)] \quad \langle e^k, \langle e, t \rangle \rangle \\
b. \ [\lbrack[t_i]] = x_i \quad \langle e^k \rangle \\
c. \ [\lbrack[t_i \ ma]] = \lambda x [\text{AT}(\lnot x_i)(x)] \quad \langle e, t \rangle \\
d. \ [\lbrack[nyip]] = \lambda P \lambda x [P(x) \land 2 \ (x)] \quad \langle e, t \rangle, \langle e, t \rangle \rangle \\
e. \ [\lbrack[nyip \ t_i \ ma]] = \lambda x [\text{AT}(\lnot x_i)(x) \land 2 \ (x)] \quad \langle e, t \rangle \\
f. \ [\lbrack[si-hni]] = girls \quad \langle e^k \rangle \\
b. \ [\lbrack[si-hni \ nyip \ t_i \ ma]] = \lambda x_i \lambda x [\text{AT}(\lnot x_i)(x) \land 2 \ (x)] (\text{girls}) \\
= \lambda x [\text{AT}(\lnot^k\text{girls})(x) \land 2(x)] \quad \langle e, t \rangle \]

Note that this analysis of numeral classifier phrases accounts not only for the fact that they can occur in predicative positions (18) (as repeated in (60a)) but also for the fact that

---

\(^8\)Simpson (2005) examines the internal structure of nominal phrases (DPs in Simpson's term) in classifier languages, such as Thai, Khmer, Burmese, Hmong, Malay and Vietnamese, and explores the factors and principles that account for the cross-linguistic variation which occurs in the ordering of constituents in nominal phrases. One of the conclusions that Simpson reaches is that the significant distortion of underlying nominal phrase structure is often caused by XP-movement inside the nominal phrase, i.e. NP-fronting (Simpson 2005: 309-323). By adopting Simpson's analysis, the underlying structure of nominal phrases containing numerals, classifiers and nouns in Nuosu Yi is the same as that in any other classifier languages.
they can be used as restrictors of demonstratives/determiners, the generic operator and quantifiers (15-17) (as repeated in (60b-d)).

(60)  
  a. *Aka sini Ako sse-vo nyip ma nge.*  
       Aka and Ako boy two Cl be  
       'Aka and Ako are two boys.'
  b. *mu cyv/a-zyx suo ma*  
       horse this/that three Cl  
       'these/those three horses.'
  c. *si-hni suo ma gaqip gur qy dox.*  
       girl three Cl piano Cl lift can  
       'Three girls can lift a piano.'
  d. *ssox-sse suo ma zzix ap zzi*  
       student three Cl every  
       'every group of three students'

Next, let us move on to the argumental use of Nuosu Yi bare numeral classifiers, as in (12-13). Recall the lexical analysis of choice function argued in Chapter 2 (Section 2.2.3). Under this analysis, numerals have a predictable lexical variant in which they are property modifiers, as we saw in (55b). The resulting numeral classifier phrase, under this analysis of numerals, is still a ClP in the syntax but an entity in the semantics. Consider first the narrow scope existential reading of the Nuosu numeral classifier phrases in (12a) (as repeated in (61)). I give in (62) and (63) an analysis to show this.

(61) *tsho suo ma dza dzu njuo.*  
       person three Cl rice eat PROG  
       'Three persons are having a meal.'

(62)

(63)  
  a. $[[t_i ma]] = \lambda x [\mathrm{AT}(\neg \chi_i)(x)]$  
  b. $[[\text{su}o]] = \lambda P \, f_3(\lambda x \, [P(x) \land 3 \, (x)])$  
  c. $[[\text{su}o \, t_i \, \text{ma}]] = f_3(\lambda x \, [\mathrm{AT}(\neg \chi_i)(x) \land 3 \, (x)])$
d. \([t\text{sho}] = \sqcap\text{persons}\)

\(e. \left[ \text{tsho, suo t, ma} \right] = f_\exists(\lambda x [\text{AT}(\sqcap\text{persons})(x) \land 3(x)])\)

The choice function analysis of bare numerals in (63b) further allows Nuosu Yi numeral classifier phrases to have the long distance interpretation if a sentence contains other scope-bearing elements, as we saw in (13) (as repeated in (64)). This long-distance ability can be explained in the same ways as it is in Mandarin (c.f. (118) in Chapter 2, Section 2.4.1).

(64) 
\(\text{ne ssox-sse nyip ma shyp ngop ddu ggep la go-li, nga khat ox.}\) 
\(\text{you student two Cl bring my home hang-out come if, I happy SFP}\) 
(i). 'If you bring two students to hang out in my house, I will be happy.'

(ii). 'If you bring two certain students to hang out in my house, I will be happy.'

With the analysis of bare numeral classifier phrases in place, we are now in a position to consider the numeral-less classifier phrases. We shall see that such numeral-less ClPs can be explained within the assumptions that we have made about bare nouns and classifiers.

### 4.8.3 Numeral-less classifier phrases in Nuosu Yi

As we saw in Section 4.4, classifier phrases without numerals are also freely allowed in Nuosu Yi. While numeral-less ClPs have been noted in languages like Mandarin (e.g. Lü 1944; Chao 1968), Cantonese (e.g. Cheng and Sybesma 1999, 2005) and Bangla (e.g. Dayal 2012), they are banned in some others, such as Southern Min (Cheng and Sybesma 1999, 2005), Thai (Jenks 2011) and Japanese (Jiang 2012). Here we address the issue of the indefinite interpretation of Nuosu Yi numeral-less ClPs:

(65) 
\(\text{a. tsho ma dza dzu njuo.}\) 
\(\text{man Cl rice eat PROG}\) 
'A man is having a meal.'

\(\text{b. cyx mu ma shep bo ox.}\) 
\(\text{3sg horse Cl look-for go ASP}\) 
'He/She went to look for a horse.'

\(\text{c. ne ssox-sse ma shyp ngop ddu ggep la go-li, nga khat ox.}\) 
\(\text{you student Cl bring my home hang-out come if, I happy ASP}\) 
(i). 'If you bring a student to hang out in my house, I will be happy.'

(ii). 'If you bring a certain student to hang out in my house, I will be happy.'

As pointed out in Section 4.4, numeral-less ClPs like those in (65) are interpreted obligatorily as singular. Descriptively speaking, such phrases are equivalent to \([\text{NP-one-Cl]}\). There could be two ways to account for this. One obvious way is to assume that there
is a null 'one' tsʰi in the syntax, so the numeral-less CIP in Nuosu Yi is not really bare but has the form [Noun Ǿ_{one} Cl]:

\[ \begin{array}{c}
\text{NP} \\
\text{tsho}'\text{man}' \\
\text{ClP} \\
\text{tsho} \\
\text{NumP}_{null} \\
\text{CI} \\
\text{Cl'} \\
\Omega_{tsho} \\
\Omega_{one} \\
\text{t} \\
\text{Cl} \\
\text{ma} \\
\end{array} \]

A similar proposal, in fact, has been made for Mandarin and Cantonese bare ClPs, both of which allow their bare ClPs with an indefinite reading (see Cheng and Sybesma 1999; Yang 2001). However, in both languages, such phrases are only possible in object positions. This suggests an explanation in terms of licensing of the null numeral by the verb. Turning to Nuosu Yi, we see that its bare ClPs are available in both subject and object positions (64), which calls into question the applicability of a null numeral account for it. In addition, there is a difference in interpretation. In other classifier languages which allow numeral-less ClPs to occur in both subject and object positions, such as Cantonese and Bangla, numeral-less ClPs receive a definite interpretation (22)/(23) (e.g. Cheng and Sybesma 1999; Dayal 2012; Simpson et al 2011, c.f. Section 4.4). However, the definite interpretation of numeral-less ClPs is not available in Nuosu Yi. So although the analysis of a null numeral in the syntax has some initial appeal, it does not seem optimal for Nuosu Yi.

Let us therefore consider an alternative approach. We may posit the following structure and derivation for the numeral-less classifier phrase in Nuosu Yi:

\[ \begin{array}{c}
\text{NP} \\
\text{tsho}'\text{man}' \\
\text{ClP} \\
\text{Cl} \\
\text{ma} \\
\end{array} \]

In (67), the classifier merges directly with the bare noun; \( AT \) in the semantics of the individual classifier, as I assumed in Chapter 2 (c.f. (30), Section 2.4.2.2), is a function from a kind to a set of atoms. The primary advantage of the analysis in (67) is that it obviates the need for syntactic licensing and predicts the unrestricted distribution of numeral-less ClPs in Nuosu Yi (c.f. (65)). As we see, the output of the numeral-less classifier phrase in (67d) is a property of type \( \langle e_\epsilon, t \rangle \). It follows that such a phrase can function as a predicate and be used as the restrictor of the generic operator, demonstratives, and determiners (e.g. (27)/(36b)/(46b)). It also follows that it can be
turned into an argument covertly either via a null D in the syntax (Borer 2005) or an argument forming type-shift in the semantics (Chierchia 1998b; Dayal 2004), which I will elaborate on it in Section 4.8.5.

To conclude, we have seen how numeral-less ClPs can be generated. I will return to the issue of their interpretation in Section 4.8.5 after discussing the role of the overt determiner.

4.8.4 The syntax of demonstrative and definite nominal phrases

We now consider the syntax and semantics of Nuosu Yi noun phrases with definite and demonstrative phrases. Given that Nuosu Yi classifier phrases, with or without a numeral, can have a predicative meaning (59)/(67), we predict correctly that they can combine with demonstratives and definite determiners. Note though that there is a difference in word order in the two cases:

\[(68)\]

a. tsho cyx nyip ma
   man this two Cl
   'these two men'
b. tsho nyip ma su
   man two Cl the
   'the two men'
c. tsho cyx ma
   man this Cl
   'this man'
d. tsho ma su
   man Cl the
   'the man'

Regarding the syntactic status of demonstratives, I adopted the view that demonstratives and article determiners do not occupy the same structural position in D that demonstratives occur in specifier positions (Löbner 1985; Giusti 1997, 2002; Brugé 2000, 2002; Brugé & Giusti 1996; Panagiotidis 2000; Grohmann and Panagiotidis 2004; Shlonsky 2004; Alexiadou et al 2007, among others); arguments for this view were provided in Section 2.4.1 (c.f. (111)-(115), Chapter 2). Definite determiners, on the other hand, occur in D; in the case of Nuosu Yi, D appears in the head final position. I give the structures for (68a) and (68b) in (69a) and (69b) respectively.

\[(69)\]

a. NP<sub>i</sub> \hspace{1cm} ClP
   tsho Dem NumP Cl'
   'man' 'this' 'two'
   [cyx] nyip t<sub>i</sub> ma
   [cyx] nyip 'two'
   [ma]
In (69a), the demonstrative appears in Spec ClP, and the bare noun *tsho 'man' undergoes NP-fronting to the initial position of the phrase (cf. Section 4.8.2), yielding the observed word order [NP Dem Num Cl]. In (69b), after the NP moves to the initial position of the ClP, the ClP merges with the definite determiner *su, leading to the surface word order [NP Num Cl *su]. As for the semantics of demonstratives, I follow Kaplan (1989), Wolter (2006) and Dayal (2012) and assume that they are property seeking functions with an indexical specification: $\exists x [\forall y (\langle L^2 \rangle \text{men}) (y) \land 2(y) \land x \text{in this}]$, in this case.

In the proposed account of Nuosu Yi in (69), demonstratives are treated in specifier positions. One may ask why demonstratives cannot co-occur with the definite determiner, occurring in the Spec DP position in Nuosu Yi, as we saw in (48) (and repeated in (70)).

\[(70)\]
\[\text{a. } *\text{tsho cyx/a-zzyx nyip ma su} \]
\[
\begin{array}{l}
\text{man this/that two Cl Su} \\
\text{Intended: 'these/those two men'}
\end{array}
\]

\[\text{b. } *\text{tsho cyx/a-zzyx ma su} \]
\[
\begin{array}{l}
\text{man this/that Cl Su} \\
\text{Intended: 'this/that man'}
\end{array}
\]

To account for this, I assume the 'Doubly Filled Comp Filter' effect in the nominal domain, which has been proposed to explain why the co-occurrence of demonstratives and definite determiners is attested in some languages but not in others (see e.g., Campbell 1996: 167; Panagiotidis 2000: 724; Giusti 2002: 70; Alexiadou et al 2007: 115). Under this analysis, Nuosu Yi is a language similar to English which only allows either the D head or the specifier of DP to be filled but not both.

A similar account is possible for numeral-less ClPs. The demonstrative phrase in (68c) and the definite DP in (68d) have the structures in (71a) and (71b) respectively:

\[(71)\]
\[\text{a.} \]
\[
\begin{array}{l}
\text{NP}_i \\
\text{tsho 'man'}
\end{array}
\]

\[
\begin{array}{l}
\text{CIP} \\
\text{Dem cyx 'this'}
\end{array}
\]

\[
\begin{array}{l}
\text{CIP} \\
\text{Cl'}
\end{array}
\]

\[
\begin{array}{l}
\text{Cl} \\
\text{ma}
\end{array}
\]
Having shown why classifier phrases with demonstratives have a different word order than those with the definite article \textit{su}, I now address the fact that Nuosu Yi is unusual among classifier languages in having a definite determiner at all.

\textbf{4.8.5 The disappearance of blocking effects}

In Section 4.5, we concluded that Nuosu Yi allows definiteness to be expressed both by bare nouns and through the use of the definite determiner \textit{su}. Two examples are repeated below:

\begin{enumerate}
\item[72] a. \textit{si-hni ma sini sse-vo ma i-go n y i, si-hni jjy nra.}
\begin{tabular}{l}
\textit{girl} Cl and \textit{boy} Cl \textit{room sit, girl} very beautiful \\
\end{tabular}
\begin{tabular}{l}
‘A girl and a boy are sitting in the room, the girl is very pretty.’
\end{tabular}
b. \textit{si-hni ma sini sse-vo ma i-go n y i, si-hni ma su jjy nra.}
\begin{tabular}{l}
\textit{girl} Cl and \textit{boy} Cl \textit{room sit, girl Cl the very beautiful} \\
\end{tabular}
\begin{tabular}{l}
‘A girl and a boy are sitting in the room, the girl is very pretty.’
\end{tabular}
\end{enumerate}

This paradigm calls into question the status of the \textit{Blocking Principle} in Chierchia (1998b), which I adopted in Chapter 2 (cf. (151b) in Section 2.5.3), as repeated below.

\begin{enumerate}
\item[73] \textit{Blocking Principle} (‘Type Shifting as Last Resort’)
For any type shifting operation $\tau$ and any $X$: $*\tau(X)$, if there is a determiner $D$ such that for any set $X$ in its domain, $D(X) = \tau(X)$
\end{enumerate}

\textit{(Chierchia 1998b)}

The \textit{Blocking Principle} prohibits the covert application of a type shift in a language that has a lexical exponent for that particular type shift. This principle is what explains the difference between the anaphoric potential of bare nominals in languages like English as opposed to languages like Hindi or Mandarin (c.f. (160) in Section 2.5.3). I repeat the examples in (74).

\begin{enumerate}
\item[74] a. Some children came in. *(The) children were happy. \quad \text{ (English)}
b. \textit{kuch baccei aaye. baccei bahut khush lage.} \quad \text{ (Hindi)}
\begin{tabular}{l}
some children came children very happy seemed \\
\end{tabular}
\begin{tabular}{l}
‘Some children came. The children seemed very happy.’ \quad \text{ (Dayal 2004)}
\end{tabular}
\end{enumerate}
The disappearance of the blocking effect in Nuosu Yi, I suggest, is due to the fact that there are two distinct operations at play, the overt operation encoded in the definite D su and the covert operation that derives definite meanings from kind-referring bare nouns, i.e., Situation Restriction, SR in short (c.f. (164) in Section 2.5.3, Chapter 2). Specifically, I claim that the overt definite D su applies only at higher or more complex nominal levels (i.e. [NP Cl]/[NP Num Cl]) and turns property-denoting nominals into entities, type <<e,t>, e>; whereas the operation Situation Restriction that covertly derives definites from kinds only applies at the lowest bare noun level (i.e. [NP]) and is a function from kinds to object-level entities of type <e^k, e> (75). That is, it saturates the world/situation index and yields the extension of the kind at that index.

(75) Two distinct operations at play: overt D su does not block Situation Restriction

\[
\begin{align*}
\text{a. } & \text{DP}_{e^k} \\
\text{b. } & \text{[NP}_{e^k} \text{s} \to \text{[NP}_{e^k}]}
\end{align*}
\]

To get a sense of why there is no discernible blocking effect in (73), let us compare the situation in Nuosu Yi with the situation in English. Here we must assume, crucially, that English is a [-arg, +pred] language, as proposed in Chierchia (2010). Since in English [NP] as well as [Num NP] denote properties, the definite determiner the and the covert type-shifting operator iota \( \iota \) would apply to nominals at both levels of structure and would be functions from properties to entities, type <<e,t>, e>. Therefore, the potential definite reading of a bare plural/singular in English which would be derived via a covert application of \( \iota \) is blocked by the equivalent lexical option, i.e. the overt determiner the (e.g. (74a)):

(76) Overt D the blocks covert shifting property to definites via iota \( \iota \)

\[
\begin{align*}
\text{a. } & \text{DP}_{e^k} \\
\text{b. } & \text{\( \iota \) [NP}_{e^k} \text{]}
\end{align*}
\]

One question naturally arises, namely why English bare NPs cannot tap into the alternative operation, in the same way as Nuosu Yi or Mandarin does, deriving object-level entities from kinds of type <e^k, e> to have definite readings (i.e. via Situation Restriction in (75b)). I will address this question in Chapter 5, Section 5.4.

Note, however, the line I am pursuing does not imply that the Blocking Principle is not at play in Nuosu Yi. As we saw in Section 4.8.3, Nuosu Yi bare ClPs [NP Cl] are

---

9 Note that, according to Nominal Mapping Hypothesis in Chierchia (1998b), English as a [+arg, +pred] language, in which count nouns denote properties [+pred], whereas mass nouns denote kinds [+arg]. However, Chierchia (2010) simplifies the Nominal Mapping Hypothesis and treats bare nouns in number marking languages (including English) as property-denoting. More discussion on this will be provided in Chapter 6, Section 6.2.2, fn. 4.
A classifier language with Ds: Nuosu Yi

In order to turn the predicative phrase into arguments, some argument formation operation must come into play in order to accomplish that, i.e. either via a D in the syntax (e.g. Longobardi 1994; Borer 205) (77a), or through covert type-shifting operations in the semantics, which range over $\cap$, $\iota$, and $\exists$ (77b, b') (e.g. Chierchia 1998b, 2016; Dayal 2004, c.f. Chapter 2, Section 2.5.3).

(77) Two ways to shift predicative bare ClPs in Nuosu Yi to arguments
a. Syntactic operation

```
     DP
    / \  \
   CIP D
  /   \  \
NP   Cl
```
b. Semantic operation

```
     ARG
    /  \  \
   [NP Cl] Cl
   /  \  \
NP   Cl
```

b'. Three canonical argument forming type-shifts (ARG):
(i) Nominalize: $\nu P = \lambda s \in P$, if $\lambda s \in P$ is in K, else undefined.
(ii) Iota: $\iota X$ = the largest member of X if there is one, else, undefined.
(iii) Existential closure: $\exists X = \lambda P \exists y [X(y) \land P(y)]$

The definite lexical determiner $su$ in Nuosu Yi can turn bare ClPs into arguments with a definite interpretation. The presence of the overt definite article $su$ in Nuosu Yi blocks the possibility of turning bare ClPs covertly into arguments with a definite reading via iota $\iota$ (78a, b), accounting for the fact that the numeral-less classifier phrases in Nuosu Yi cannot receive a definite interpretation (c.f. (26), as repeated in (78c)).

(78) Overt D $su$ blocks covert shifting [NP Cl] to definites
a.            b. ARG CIP = $\iota (\lambda T(\lambda k))$, blocked by $su$
```
     DP
    / \  \
   CIP D
  /   \  \
NP   Cl
```
c. *si-hni ma sin sse-vo ma i-go nyi, si-hni ma #(su) jiy nra.*
girl Cl and boy Cl room sit, girl Cl the very beautiful

‘A girl and a boy are sitting in the room; the girl is very pretty.’

Although covertly argumentizing numeral-less ClPs to derive definite arguments is blocked by the presence of the definite determiner $su$, the same is not true when we turn to kind formation and indefinites. Since Nuosu Yi does not have visible indefinite determiners or kind formation determiners detected in its grammar, it becomes possible, and in fact necessary, to appeal to covert argumentizing if we want to obtain either a kind or indefinite interpretation of the numeral-less CIP. Regard covert argument formation operations, it can be a null D in the syntax (79a) or a covert type-shifting operation in the
semantics (79b). Recall from Chapter 2 (Section 2.5.3) that, the term 'ARG' is used to represent covert argument-forming operations, i.e. a null D in the syntax and the covert type-shifts in the semantics; it can be viewed as a variable ranging over 'kinds' \( \cap \), 'definites' \( \exists \), and 'indefinites' \( \mathcal{I} \) (77b) (c.f. Chapter 2, Section 2.5.3).

(79) Covert operation to argumentize [NP Cl] in the syntax or in the semantics
a. null D in the syntax    b. Covert type-shifting in the semantics

Given that the formation of bare arguments in (79) involves only covert operations, either a null D or a covert type-shift, Ranking of Meaning (c.f. (151a), Chapter 2) comes into play in order to decide which specific operation, ‘kinds’ or ‘indefinite’, should apply to bare ClPs in the first place.

(80) Ranking of Meaning: \( \{ \cap, \exists \} > \mathcal{I} \) (Chierchia 1998b, as modified by Dayal 2004)

Since ‘kinds’ ranks above ‘indefinites’, the first operation to consider is kind formation ‘\( \cap \)’ (81a/b). That is to say, Nuosu Yi bare ClPs should first be expected to denote kinds after it is argumentized covertly. However, this possibility ends up being ruled out for independent reasons. As introduced in Section 4.4, Nuosu Yi numeral-less ClPs can only be interpreted as singular; to turn singular properties, i.e. bare ClPs, to kinds through ‘\( \cap \)’ will be undefined since the semantics of singularity clashes with the notional notion of a kind which corresponds to the plurality of all instances of the property (e.g. Dayal 1992, Chierchia 1998b). Therefore shifting numeral-less ClPs in Nuosu Yi to kinds covertly becomes impossible, excluding the possibilities in (81). This accounts for the fact that numeral-less ClPs in Nuosu Yi cannot be used with kind level predicates to receive a kind interpretation in (28) (as repeated in (82)).

(81) Covert operations to argumentize [NP Cl] with a kind reading (ruled out)
a. null D in the syntax    b. covert type-shifting in the semantics
c. \( \cap [NP Cl] = \cap (AT(\cap \mathcal{I} k)), \) undefined for singular properties

(82) * ko-lo ma gi ox.
dinosaur Cl extinct ASP
Intended: ‘The dinosaur is extinct.’
In Section 4.4, I showed that Nuosu Yi has a plural-like morpheme ggex appearing in the same position as other classifiers and that the [NP ggex] phrase receives a plural interpretation (c.f. (30)). I further showed this morpheme ggex should not be regarded as a plural classifier and suggested that we treat it as a partitive classifier, similar to the partitive classifier xie in Mandarin, which partitions nouns to create a large quantity of it. Since a partitive classifiers only create a portion of kinds, the meaning of [N ggex] also clashes with the conceptual notion of a kind, which corresponds to the *plurality* of all instances of the property. This accounts for why [N ggex] also cannot be used with kind predicate to receive a kind interpretation (c.f. (31)).

Since shifting to ‘kinds’ and ‘definite’ covertly have both been excluded (due to singularity (81) and existence of an overt determiner (78b)), the only possibility left is to turn [NP Cl] covertly into an argument with an indefinite reading via ‘∃’ (83a/b). This indeed is what happens in Nuosu Yi: its bare ClPs are indefinite only, thereby predicting the scopal properties we saw in Section 4.4 (c.f. (25), as repeated in (84)).

(83) Covert operations to argumentize [NP Cl] with an indefinite reading
1. null D in the syntax
2. covert type-shifting in the semantics

\[
\begin{array}{ccc}
\text{NP} & \text{Cl} & \text{D}_{null} \\
\text{DP} & \text{ClP} & \text{ARG}_\exists \\
\end{array}
\]

\[
\text{c.} \exists [\text{NP Cl}] = \exists (\text{AT('k'))}, \text{indefinite}
\]

(84)  
[b. *tsho ma dza dzu njuo.*
man Cl rice eat PROG
‘A man is having a meal.’

c. *ne ssos-xse ma shyp ngop ddu ggep la go-li, nga khat ox.*
you student Cl bring my home hang-out come if, I happy ASP
(i). 'If you bring a student to hang out in my house, I will be happy.'
(ii). 'If you bring a certain student to hang out in my house, I will be happy.'

As we see in (83), Nuosu Yi can employ either a null D in the syntax or a type-shifting in the semantics to argumentize [NP Cl] with an indefinite interpretation; I will keep both options open since we now have no argument to argue for one or the other.\(^{10}\)

I will now discuss the final question raised by our description of Nuosu Yi, namely, the obligatory presence of classifiers in noun phrases with the definite determiner or the demonstratives. The examples are repeated in (85a) and (85b):

\(^{10}\) In (27) in Section 4.4, we saw that bare ClPs in Nuosu Yi can receive a generic interpretation in generic sentences. This can be accounted for via the universal generic operator Gen in generic sentences discussed in Krifka et al (1995). The example is repeated in (ia) with the analysis given in (ib).

(i) Nuosu Yi bare ClPs in generic sentences
   a. *a-nyie ma a-hie yo yie.*
cat Cl mouse catch should
   ‘A cat should catch mice.’
   b. [[a-nyie ma a-hie yo yie]] = Gen x, s [a-nyie ma (x)] [a-hie yo (x, s)]
A classifier language with Ds: Nuosu Yi

I propose that there is a simple type-theoretic explanation for this. Definite determiners and demonstratives are functions from properties to entities. Bare nouns in Nuosu Yi are kind denoting. Hence, when determiners or demonstratives combine with kind-referring bare nouns, a type-mismatch arises. Yi requires a classifier to shift kinds to properties in order to combine with determiners and demonstratives.\(^{11}\)

To summarize, we have seen that the particular properties of Nuosu Yi nominals noted in Sections 4.2 — 4.6 are amenable to an analysis within the Neocarlsonian approach to bare nominals adopted in Chapter 2. In the next section, I will expand the discussion to justify the choice of the Neocarlsonian approach to bare nominal semantics in classifier languages.

4.8.6 The Neocarlsonian approach versus other approaches

In explaining the properties of bare nouns in Mandarin (Chapter 2, Section 2.5.3) and Nuosu Yi (Section 4.8.1), I adopted the Neocarlsonian view that bare nominal argument terms denote kinds and that their object level meanings are derived from their basic kind

\(^{11}\) In generic sentences, I have analyzed bare nouns in Nuosu Yi as undergoing predicativization via the up-operator \(\uparrow\) (53b). One may ask why the up-operator cannot shift kinds to properties in order to allow the definite determiner or demonstratives to combine with bare nouns in Nuosu Yi:

(i) *si-hni su = t \(\uparrow\) (\(^{\sim}\)girls(x))

I would suggest that the derivation in (i) is not economical as it involves redundant computational steps. To illustrate, Ds or type-shifters are supposed to repair type mismatch and make the 'unsaturated' predicative nouns argumental (as in Higginbotham 1987; Szabolcsi 1994). Nevertheless, in (i) a type mismatch is 'created' on purpose just so it can feed the use of D in the syntax or type-shifting in the semantics. In other words, a noun that is already argumental is 'forced' to become a predicate and then back to an argument, with the same 'argumental' result. When a one-step, direct derivation is available (i.e. Situation Restriction), two-step derivations of the kind seen in (i) can be viewed as a departure from computational efficiency, a third factor principle (a term due to Chomsky (2005)) not specific to but also applicable to the human language faculty (Chomsky 2005, 2007, 2008).
level meaning. An alternative view takes bare nominals to be ambiguous between kind terms and indefinites, based on evidence drawn from bare plurals in Germanic languages like English and German (e.g. Krifka 1988, Wilksinon 1991, Diseing 1992, Kratzer 1995). I refer to this approach as the Ambiguity Approach after Chierchia (1998b). One of the main arguments against the Ambiguity Approach is that it has problems explaining the special narrowest scope properties of bare plurals noted by Carlson (1977a, b) (c.f. Chapter 2, Section 2.5.3). In addition, a theory for predicting cross-linguistic variation in the nominal domain has not been developed within this approach, as pointed out in Dayal (2004, 2012). The Neocarlsonian approach, on the other hand, does have such a theory which draws evidence from bare nominals in a much wider range of languages, such as English, German, Italian, Mandarin, Hindi and Russian. This theory has been extended to examine bare nouns in various classifier languages such as Mandarin (e.g. Yang 2001; X. Li 2011, 2013; Jiang 2012); Japanese (e.g. Nemoto 2005), Thai (e.g. Piriyawiboon 2010; Jenks 2011), Vietnamese (e.g. Trinh 2011), and Bangla (e.g. Dayal 2012, 2014).

Although the analysis of Nuosu Yi presented here does not provide definitive evidence in favor of the Neocarlsonian over the Ambiguity Approach, I demonstrated that the Mandarin and Nuosu Yi paradigms discussed so far fall readily within the predictions of a Neocarlsonian theory of variation. At the same time, the modifications prompted by the facts of Nuosu Yi make further predictions about classifier languages (cf. Section 4.7). Hence, Nuosu Yi, this typologically rare language, in a sense provides indirect confirmation for the Neocarlsonian approach.

In addition to the debate regarding the reference of bare nominals, there is also an ongoing debate about the syntax of argument formation. Nouns have been claimed to universally denote properties and therefore must occur with an article D in order to serve as arguments (e.g. Longobardi 1994, 2001; Borer 2005). If there is no overt D, a covert D is assumed. There is also a view that the D projection is subject to parameterization (e.g. Chierchia 1998; Dayal 2004; Bošković 2005, 2007, 2008). Whether D is syntactically projected or not depends on one of two things: the possibility that nouns may be inherently argumental (i.e. kind-referring) and the availability of a semantic operation that turns nouns of the property-type into arguments, subject to some kind of blocking.

The discovery of a classifier language with an overt determiner may seem to tilt the balance in favor of the universal DP Hypothesis and also disprove the Nominal Mapping Hypothesis, since such a language contradicts Chierchia's (1998b) speculation that classifier languages should not develop article determiners in their grammar. However, I would argue that the opposite is the case.

First, the universal DP hypothesis would make incorrect predictions for Nuosu Yi nominal arguments. If we assume that bare nouns in Nuosu Yi are property-denoting instead of kind-denoting and require a D to turn them into arguments, we would expect the determiner su to combine with bare nouns directly in the same way as the determiner the in English combines with bare nouns. However, as we saw in Section 4.4, this is disallowed in Nuosu Yi. As for Chierchia's (1998b) speculation that classifier languages should not develop article determiners in their grammar, I suggested in Section 4.7 that this speculation might well explain why overt Ds are so rare in classifier languages and that the logic of the framework itself foresees nominal structures that are predicative, hence providing room for article Ds to develop in such languages.
Second, a property-denoting analysis of bare nouns cannot justify the need for classifiers in general, as we have already seen in Chapter 2 (Section 2.4.2). Specifically, if nouns in classifier languages are property-denoting, type \(e, t\), then they will have to be true of something. There are two logical possibilities. One is to assume that these nouns are mass only properties (e.g. Krifka 2004: 193). If so, classifiers are needed to quantize these nouns, i.e. to turn mass properties into natural sub-properties (atomic or non-atomic). Another possibility is to assume that nouns in classifier languages are properties which are underspecified for the mass-count distinction. On this view, every noun can apply to either whole individuals or to their parts. Hence, a noun like 'shrimp' in classifier languages, for example, will be true in a world of 'shrimps' or 'their parts' (i.e. shrimp meat). The same would have to be true of 'dog', 'table', 'water', 'blood' or any other noun. Then classifiers would be needed to quantize all nouns, i.e. to turn "underspecified properties" into "natural sub-properties".

Although this 'property' thesis might seem appealing, it runs into a serious problem. Both theoretical work and experimental work have argued that nouns in classifier languages make a lexical distinction between mass and count (e.g. Imai and Gentner 1997; Cheng and Sybesma 1999; Cheng, Doetjes and Sybesma 2008; Li et al. 2009; Doetjes 2012). In particular, Cheng and Sybesma (1999) have argued that the mass-count distinction manifests itself through the classifier system: one set of classifiers, i.e. 'individual classifiers', or 'count-classifiers', must combine with nouns that are notional count. In contrast, other sets of classifiers, such as 'measure classifiers' and 'container classifiers', do not have such a restriction, i.e. they can combine with either notional count or notional mass nouns. The behavior of individual classifiers presupposes that nouns in classifier languages are lexically divided into count and mass, e.g. it is the lexical property of 'water' and 'flour' that prevents them from combining with individual classifiers. So if nouns in classifier languages in general are mass-only properties or are undifferentiated between mass properties and count properties, the restriction on individual classifiers would have no force. One would wrongly expect that individual classifiers should work with both types of nouns, just like other types of classifiers do. Hence, if nouns denote properties in classifier languages, the status of classifiers is put into question. On the contrary, a kind-denoting analysis of bare nouns in classifier languages provides a natural account for the obligatory existence of classifiers (c.f. Chapter 2, Section 2.4.2).

### 4.9 Summary

Chapter 4 presented a typologically new kind of language, Nuosu Yi, and showed that it exhibits the expected features of a classifier language: it has bare nouns that freely serve as arguments with kind/generic, narrow scope indefinite and definite readings. However, it also has an overt definite article which encodes presuppositions of familiarity, uniqueness and maximality. The presence of the definite article is at odds with an observation in the literature that the definite articles block the possibility of definite readings for bare nouns. I further showed that Nuosu Yi has demonstratives that differ from most other classifier languages in their inability to combine with bare nouns directly. Demonstratives and the definite article in Nuosu Yi both require the mediation of a classifier or a plural morpheme. The novel properties of Nuosu Yi raised a series of
questions concerning argument formation in Nuosu Yi, the internal structure of Nuosu Yi nominal arguments, language variation among classifier languages and argument formation in general.

Crucially, the facts of Nuosu Yi showed to us that a modification of Chierchia's (1998b) framework is needed. The modified framework accounts for why classifier languages with overt Ds are possible but rare as well as allowing us to make further predictions about classifier languages: (1) a classifier language with overt article Ds which disallow bare arguments (analogue of English/Italian/French) should not exist, and (2) if an overt article D should develop in a classifier language, it should only apply at higher nominal levels which are property-denoting, e.g., at the level of property-denoting numeral-classifier phrases, and not at the level of kind-refering bare nouns. If an intermediate projection between numeral-classifier phrases and bare nouns that is property denoting, namely a bare ClP, is available, article Ds can apply at this level as well. The modified framework further permitted a novel conjecture, namely that the development of overt article Ds in classifier languages would only be allowed if they behave in the same way as the definite article in Nuosu Yi. It, of course, remains to be seen whether these predictions are borne out as classifier languages are investigated in further studies.

At the end of the chapter, I suggested that the Neocarlsonian approach is better equipped to handle Nuosu Yi, Mandarin and classifier languages in general than an alternative theory where bare nouns can be kinds as well as indefinites. The discovery of a classifier language with an overt article determiner may seem to tilt the balance in favor of the universal DP hypothesis; however, I argued that the opposite is the case.

In the next two chapters, I will explore the implications of the account of Mandarin and Nuosu Yi nominals for a cross-linguistic theory of nominal argument formation.
Part III

When what you see is what you get and when it is not

— Language universals, variation and typology of nominal arguments
Chapter 5

Variation in classifier languages

5.1 Introduction

The previous three chapters provided analyses of two kinds of classifier languages: one that shows evidence of a DP projection and one does not. Nuosu Yi was the language used as a representative for the classifier languages that show visible evidence of D, while Mandarin was the representative language for the classifier languages that do not have a DP.

The goal of this current chapter is to develop a uniform account of bare nominal arguments (i.e. bare numeral classifier phrases, bare classifier phrases, bare nouns) in classifier languages. I will achieve that by having an overview of more classifier languages, and I will survey them in a more general way than those discussed in previous chapters. I start with three points on which Mandarin and Nuosu Yi differ and which make this comparison interesting from the perspective of building a theory of cross-linguistic variation. Their differences, as I will show, mainly lie in: (i) whether or not they have the function category D in their grammar, (ii) whether or not they freely allow numeral-less classifier phrases to appear in argument positions, as a result of applying covert argument formation operations (ARG) unrestrictedly, and (iii) whether or not they allow one-deletion from the [one Cl N] phrase in the PF. I propose three parameters to account for the variation: \( \pm D, \pm ARG, \pm \text{one-deletion} \). The three parameters make predictions about eight types of classifier languages, most of which, as we will see, are indeed attested.

This chapter is organized as follows. Section 5.2 discusses similarities and differences between Mandarin and Nuosu Yi and suggests three parameters for cross-linguistic variation to account for the differences. Section 5.3 discusses the predictions about other types of classifier languages and identifies languages that instantiate these predictions. We will see that the analysis of Mandarin and Nuosu Yi developed in the previous chapters is able to provide a uniform account of nominal arguments in classifier languages more generally. In Section 5.4, I examine the variation in expressing definiteness via bare nouns in classifier languages. Section 5.5 summarizes the universal properties and variable properties of bare nominal arguments in classifier languages and concludes with a preliminary language typology with regard to nominal argument formation, which will be further developed in Chapter 6.

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5.2 Parameters in classifier languages: how Mandarin and Nuosu Yi differ

Based on the discussion in Chapter 2 and Chapter 4, this section focuses on three points on which Mandarin and Nuosu Yi differ and which make this comparison interesting from the perspective of building a theory of cross-linguistic variation.

Let me first start with the similarities that Mandarin and Nuosu Yi share. First, they both are classifier languages. Second, they both freely allow bare nouns in argument position, with essentially the same range of interpretations. Third, numeral classifier phrases in both languages can be predicative as well as argumental, with peculiar scope behaviors, as summarized below.

(1) Similarities between Mandarin and Nuosu Yi

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Mandarin</th>
<th>Nuosu Yi</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. classifier language</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii. bare nouns freely allowed in argument position, with the same range of interpretations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>iii. numeral classifier phrases can be predicative as well as argumental, with an indefinite reading and peculiar scope behaviors</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Turning now to the differences between the two, which I summarize first below.

(2) Differences between Mandarin and Nuosu Yi

<table>
<thead>
<tr>
<th>Differences</th>
<th>Mandarin</th>
<th>Nuosu Yi</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. lack of overt article</td>
<td></td>
<td>existence of overt article</td>
</tr>
<tr>
<td>ii. bare ClPs allowed only in restricted position</td>
<td></td>
<td>bare ClPs freely allowed</td>
</tr>
<tr>
<td>iii. demonstratives freely combine with bare nouns</td>
<td></td>
<td>demonstratives cannot combine with bare nouns</td>
</tr>
</tbody>
</table>

The first dimension of variation between Mandarin and Nuosu Yi lies in the existence of an overt definite determiner. Like the majority of classifier languages, Mandarin lacks overt article determiners like ‘the’ or ‘a’ although it does have demonstratives (c.f. Chapter 2, Section 2.5.4). Detailed arguments from Mandarin provided in Chapter 2 and Chapter 3 have shown that it is unnecessary to assume a functional category D that is always invisible in Mandarin in order to account for the behavior of nominal arguments in this language. Under this analysis, Mandarin is a classifier language without the functional category D in its grammar, i.e. [−D]. Nuosu Yi, in contrast, has a morpheme $su$ which encodes presuppositions of familiarity, uniqueness and maximality and has all the functions that definite determiners like English ‘the’ have (c.f. Chapter 4). Nuosu Yi,

---

1 Note that Nuosu Yi is not unique in having only a definite determiner and not having an indefinite determiner. It is a general fact that languages having definite lexical determiners need not necessarily also have indefinite ones, e.g. Attic Greek or Hebrew (Chierchia 1998b: 362). As for why there exist language variation in expressing definiteness among classifier languages, I will discuss it in Section 5.4.
therefore, is arguably a classifier language that possesses the functional category D. This is the first difference between Mandarin and Nuosu Yi, [−D] versus [+D].

The second difference between the two is whether numeral-less classifier phrases (bare ClPs) are freely allowed. Numeral-less classifier phrases in Mandarin are only allowed in very restricted positions, with an indefinite interpretation (3) (c.f. Chapter 2, Section 2.6). In contrast, Nuosu Yi has unrestricted bare ClPs in argument positions, also with an indefinite reading (4) (c.f. Chapter 4, Section 4.3).

(3)  

a. *ge ren zai chi fan.  

Cl person PROG eat rice  

Intended: ‘A/The man is having a meal.’

b. ta chuqu zhao pi ma.  

3s go-out look-for Cl horse  

‘He went to look for a horse’

c. *ta chuqu zhao pi ma he zhi mao.  

3s go-out look-for Cl horse and Cl cat  

Intended: ‘He went to look for a horse and a cat.’

(4)  

a. tsho ma dza dzu njuo.  

person Cl rice eat PROG  

‘A person is having a meal.’

b. tshi mu ma shep bo ox.  

3s horse Cl look-for go SFP  

‘He went to look for a horse.’

c. tshi mu ma sini a-nyie ma shep bo ox.  

3s horse Cl and cat Cl look-for go SFP  

‘He went to look for a horse and a cat.’

Bare ClPs in Mandarin, as argued in Chapter 2, are not really bare in the syntax; instead they have the structure of the numeral classifier phrase [one Cl N], and it is the process of eliding the numeral one at PF that leads to the surface bare form of [Cl N] (5). As expected, its interpretation aligns with that of indefinites. The second difference between Mandarin and Nuosu Yi, then, can be reduced to the fact that the former has an unpronounced numeral one in the syntax which requires syntactic or phonological licensing. Nuosu Yi, instead, has a genuine bare classifier structure, consisting only of a bare noun and a classifier (6), which has no licensing requirement. To derive argumental meanings, bare ClPs in Nuosu Yi employ either the overt article determiner su in the syntax (7i) or the covert argument forming operation ARG (i.e. a null D in the syntax or a covert type-shift in the semantics) (7ii), which is subject to Blocking Principle and Ranking of Meaning (8), as explicated in Chapter 4, Section 4.8.3.
Variation in classifier languages

(5) Structure of Mandarin [Cl N]: [one Cl N] in the syntax
   a. Syntax
      \[\text{ClP} \rightarrow \text{NumP} \quad \text{yi} \quad \text{Cl} \quad \text{NP} \]
      'one'
   b. PF
      \[\text{yi Cl N} \]

(6) Structure of Nuosu Yi [NP Cl]: truly bare
   \[\text{ClP} \rightarrow \text{NP} \quad \text{Cl} \quad \text{tsho ma} \]
   'man'

(7) Two ways to shift predicative bare ClPs in Nuosu Yi to arguments
   i. Overt operation in the syntax
      \[\text{DP} \rightarrow \text{ClP} \quad \text{D} \quad \text{su} \quad \text{NP} \quad \text{Cl} \]
   ii. Covert operation to argumentize [NP Cl] (ARG)
      a. null D in the syntax  or  b. Covert type-shifting in the semantics
      \[\text{DP} \rightarrow \text{ARG} \quad \text{ClP} \quad \text{D} \quad \text{null} \quad \text{NP} \quad \text{Cl} \]
   c. Three canonical argument forming type-shifts (ARG):
      (i) Nominalize: \(\text{P} = \lambda s \times P_s\), if \(\lambda s \times P_s\) is in K, else undefined.
      (ii) Iota: \(\tau X = \text{the largest member of X if there is one, else, undefined.}\)
      (iii) Existential closure: \(\exists X = \lambda P \exists y[X(y) \land P(y)]\)

(8) a. Ranking of Meaning: \(\{\cap, \tau\} > \exists\) (Chierchia 1998b, revised in Dayal 2004)
   b. Blocking Principle (‘Type Shifting as Last Resort’) (Chierchia 1998b)
   For any type shifting operation \(\tau\) and any \(X: *\tau(X)\), if there is a determiner \(D\)
   such that for any set \(X\) in its domain, \(D(X) = \tau(X)\)

One might ask what prevents a language like Mandarin from having real bare ClPs of the
Nuosu Yi kind. I suggest that languages vary with respect to whether they can
unrestrictedly utilize covert operations, i.e. ARG (7ii), in the formation of arguments. To
be concrete, in Chierchia (2016), ARG is assumed to be universally available but would
be subject to parameterization. In particular, a language may choose to employ it freely,
or to restrict it to specific positions, or not to have it at all. In the case of classifier languages, if a classifier language employs ARG unrestrictedly, we should expect that the numeral-less classifier phrases [Cl N] can be argumentized, occurring freely in argument position; in contrast, if a classifier language does not employ ARG unrestrictedly, then we may expect that its bare CIPs cannot be argumentized. Under this view, Nuosu Yi would be classified as [+ARG unrestricted] and Mandarin as [−ARG unrestricted]. Crucially, [−ARG unrestricted] does not imply that Mandarin never uses the three type-shifting operations $\iota$, $\cap$, and $\exists$. Instead, it means that ARG is not employed freely (e.g. it doesn't apply to certain structures like [Cl N]). In other words, I suggest that being [−ARG unrestricted] does not prevent Mandarin from employing covert type-shifting operations to argumentize other types of structures, for example covert type-shifting operations are still needed to argumentize the N-men 'N-plural' phrase in Mandarin (c.f. Chapter 3, Section 3.6.1). The [±ARG unrestricted] parameter, as will see in Chapter 6, captures not only variation in classifier languages but also variation in number marking languages, such as English, French, and Italian.

Now, let us turn to the final difference noted earlier between Mandarin and Nuosu Yi. As seen in Chapter 4 (Section 4.6), demonstratives in Mandarin can freely combine with higher projections as well as bare nouns (9), whereas demonstratives as well as the determiner $su$ in Nuosu Yi combine only with higher nominal projections that contain classifiers, never with bare nouns (10):

\[
\begin{align*}
\text{(9)} & \quad \text{a. } \text{zhe ren} \quad \text{b. } \text{zhe ge ren} \quad \text{c. } \text{zhe liang ge ren} \\
& \text{'this man'} \quad \text{'this Cl man'} \quad \text{'this two Cl man'}
\end{align*}
\]

\[2\] One may have the impression that the numeral-less classifier phrase is a rare structure among classifier languages and propose that the numeral-less classifier phrase is derived from the more common structure, i.e. the numeral classifier phrase, via some operation that removes the numeral from the numeral classifier phrase. Under this view, language variation may lie in whether or not a language employs such an operation to remove the numeral from the numeral classifier phrase. Indeed, Jiang (2012, 2014, 2015) pursues this approach to numeral-less classifier phrases. In this work, I do pursue this analysis for two empirical reasons. First, such an analysis makes wrong predictions about nominal structures in classifier languages. In particular, this analysis would predict that if a language lacks an operation to derive the numeral-less classifier phrase from numeral classifier phrase, we should not expect the numeral-less phrase [Cl N] to appear in this language since numerals always appear with classifiers; however, such a prediction is not borne out. For example, although the bare classifier phrase [Cl N] is banned in Thai (ia), when this phrase is modified by relative clauses, it becomes acceptable in Thai and can occur in argument position (ib) (see Jenks 2011).

\[
\begin{align*}
\text{(i)} & \quad \text{a. } \text{thúrian liuk} \\
& \text{durian Cl} \quad \text{Intended: 'the/a durian'} \\
\text{b. } \text{thúrian liuk thîi mën} \\
& \text{durian Cl REL stinks} \quad \text{'the durian that stinks'}
\end{align*}
\]

Second, the numeral-less classifier phrase ([Cl N] or [N Cl]) is not uncommon and is widely attested in classifier languages, such as Cantonese, Bangla, Vietnamese, Wu, Hmong, Bisu, and Zhuang (see Cheng and Sybesma 1999; Xu 2001; Nguyen 2004; Y. Li 2008; Sio and Sybesma 2008; D. Liu 2010; Dayal 2012; X. Li 2011, 2013, among many others).
Variation in classifier languages

(10) a. *tsho cyx man this 'this man'  
    b. tsho cyx ma man this Cl  
    c. tsho cyx nyip ma (Nuosu Yi) man this two Cl  
    a'. *tsho su man the 'the man'  
    b. tsho ma su man Cl the  
    c. tsho nyip ma su (Nuosu Yi) man two Cl the 'these two men'

This contrast raises the question whether the alternation is a relative 'local' form of syntactic variation or whether it reveals something deeper about the difference between article determiners and demonstratives. I will suggest that the latter is the case: article determiners are universally property-seeking functions, type <<e,t>, e>; whereas demonstratives can be either property-seeking functions of type <<e,t>, e> or kind-seeking functions, type <e^k, e>. In particular, the same strategy to derive definites from kinds (e.g. Trinh 2011; Dayal 2011a, 2012; Jiang 2012, c.f. Chapter 2), plus an indexical component, can be exploited to interpret [Dem NP] in Mandarin. For instance, the semantics of Mandarin [Dem NP] phrase *zhe ren 'this man' in (9a) can be analyzed roughly as follows: [*zhe ren] = [men^e_k] (this) where the demonstrative is a kind-seeking function with an indexical specification of type <e^k, e>; it saturates the (distal) situation index and yields the extension of the kind at that index.

The final difference between Mandarin and Nuosu Yi, then, lies in that demonstratives in Mandarin can be either property-seeking functions or kind-seeking functions and can merge with either higher nominal phrases containing classifiers or bare nouns (11). Demonstratives in Nuosu Yi, on the other hand, are exclusively property-seeking functions and can only merge with higher nominal phrases containing classifiers (12). In other words, Nuosu Yi differs from Mandarin in requiring a classifier to shift kinds to properties in order to combine with demonstratives: [Dem NP] is ruled out in Nuosu Yi as a result of a semantic type mismatch.³

³ There is a potential problem with this solution. If a type-shift from e^k to <<e,t> is available to Nuosu Yi bare nouns in the restrictor of the Gen operator and in predicative positions (c.f. section 4.8.1, chapter 4), it is not so straightforward to block it from applying in [Dem NP]. I leave further refinements of this proposal for another occasion.
Variation in classifier languages

(12)  a.  
\[
\begin{array}{c}
\text{NP}_1 \\
\text{tsho} \\
\text{'man'} \\
\end{array} - \text{ClP} - \text{ClP} - \text{Cl'} - \text{Cl'} - \text{Cl}
\]

b.  
\[
\begin{array}{c}
\text{NP}_1 \\
\text{tsho} \\
\text{'man'} \\
\end{array} - \text{ClP} - \text{ClP} - \text{Cl'} - \text{Cl}
\]

c.  
\[
\begin{array}{c}
\text{Dem} \\
\text{cyx} \\
\text{'this'} \\
\end{array} \rightarrow \text{composition cannot proceed, type-mismatch}
\]

In this subsection, we saw three similarities and three differences between Mandarin and Nuosu Yi. I suggested possibilities for cross-linguistic variation to account for the differences. As we shall see in the next section, the parameters suggested in this section make further predictions about other types of classifier languages.

5.3 Predictions about other types of classifier languages

The variable property of having an overt article determiner \([\pm D]\) and the variable property of freely allowing numeral-less ClPs in argument positions (the result of applying semantic type-shifting ARG unrestrictedly) \([\pm \text{ARG}_{\text{unrestricted}}]\) have captured two types of classifier languages. Since nothing in the theory predicts a one-to-one correspondence between the presence of D and the unrestricted semantic type-shifting ARG, these two parameters predict four types of classifier languages:

(13)  Predicting classifier languages with \([\pm D]\) and \([\pm \text{ARG}_{\text{unrestricted}}]\)

<table>
<thead>
<tr>
<th>Classifier languages</th>
<th>D</th>
<th>(\text{ARG}_{\text{unrestricted}})</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Mandarin</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(ii) Nuosu Yi</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(iii) ?</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>(iv) ?</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

The first type lacks the functional category D and does not employ the covert semantic shifting operation ARG in an unrestricted way, and this is represented by Mandarin (13i). The second type of classifier language that was discussed has the functional category D and employs the covert semantic type-shifting unrestrictedly, and this is represented by Nuosu Yi (13ii). The third type does not have D but has \(\text{ARG}_{\text{unrestricted}}\) (13iii), and the fourth type has D but lacks \(\text{ARG}_{\text{unrestricted}}\) (13iv). Section 5.3.1 and Section 5.3.2 will
Variation in classifier languages

provide additional typological arguments for the proposed analysis of Mandarin and Nuosu Yi. Specifically, we will see that the proposed analysis is typologically adequate in that the two types of classifier languages predicted in (13iii) and (13iv) are attested, with Cantonese and Thai instantiating these types respectively.

Recall that Mandarin allows the process of eliding the numeral one at PF that leads to the surface bare form of [Cl N] (c.f. Chapter 2, Section 2.6); if we consider this as another dimension of variation in classifier languages [±one-deletion], we will predict further types of classifier languages, most of which indeed are attested:

(14) Predicting classifier languages with [±D, ±ARGunrestricted, ±one-deletion]

<table>
<thead>
<tr>
<th>Classifier language</th>
<th>D</th>
<th>ARGunrestricted</th>
<th>One-deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Mandarin,</td>
<td>−</td>
<td>−</td>
<td>+</td>
</tr>
<tr>
<td>(ii) Cantonese</td>
<td>−</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(iii) Southern Min,</td>
<td>−</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>Japanese, Korean</td>
<td>−</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>(iv) Bisu</td>
<td>−</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>(v) Nuosu Yi</td>
<td>+</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>(vi) Thai</td>
<td>+</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>(vii) Vietnamese</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(viii) ?</td>
<td>+</td>
<td>−</td>
<td>+</td>
</tr>
</tbody>
</table>

In Section 5.3.1, we will see the predictions about classifier languages without D as well languages attested by these predictions (i.e. (14i) - (14iv)); the discussion on the predictions about classifier languages with D and languages attested by these predictions (i.e. (14v) - (14viii)) will be provided in Section 5.3.2.

5.3.1 Predicting other classifier languages without D

I start this section with the predictions about classifier languages that do not possess the functional category D in the grammar but employ semantic type-shifting ARG unrestrictedly and one-deletion at PF: [−D, +ARGunrestricted, +one-deletion]. The discussion on the other two types of classifier languages without D will be taken up in Section 5.3.1.2 and Section 5.3.1.3.

5.3.1.1 Classifier languages: [−D, +ARGunrestricted, +one-deletion]

Classifier languages without D but with ARGunrestricted and one-deletion should have four main properties in (15).
Variation in classifier languages

Properties of \([-D, +\text{ARG}_{\text{unrestricted}}, +\text{one-deletion}]\) languages

<table>
<thead>
<tr>
<th>Properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Bare nouns should behave like those in Mandarin and Nuosu Yi</td>
<td></td>
</tr>
<tr>
<td>ii. Bare numeral classifier phrases should be both predicative and</td>
<td></td>
</tr>
<tr>
<td>argumental with only an indefinite reading</td>
<td></td>
</tr>
<tr>
<td>iii. Numeral-less classifier phrases with a definite reading should be</td>
<td></td>
</tr>
<tr>
<td>freely allowed in argument position</td>
<td></td>
</tr>
<tr>
<td>iv. Numeral-less classifier phrase with an indefinite reading should be</td>
<td></td>
</tr>
<tr>
<td>attested in at least restricted position</td>
<td></td>
</tr>
</tbody>
</table>

I will discuss each property below and show that Cantonese instantiates all these properties.

First, as argued in Chapter 2 and Chapter 4, bare nouns in classifier languages denote kinds (c.f. Section 2.4 and Section 4.8.6), those in classifier languages without D but with \(\text{ARG}_{\text{unrestricted}}\) and one-deletion should also be kind-referring and behave like those in Mandarin and Nuosu Yi. Specifically, their bare nouns should (i) combine directly with a verb and appear freely in argument positions; (ii) refer to kinds with kind-level predicates; (iii) not be able to combine directly with a numeral; (iv) receive a generic interpretation in generic sentences; (v) receive an existential interpretation via Derived Kind Predication (DKP) in episodic sentences; and (vi) have a definite interpretation via Situation Restriction (SR) in episodic sentences.

Second, since the functional category D is absent, bare numeral classifier phrases in classifier languages of this type should only receive an indefinite interpretation in argument position. Note that in classifier languages with Ds, numeral classifier phrases have the option to shift to definites via the definite D, such as those in Nuosu Yi (c.f. Chapter 4). However, in classifier languages without D, this option is not available. While they are unable to shift to definites, numeral classifier phrases do, however, have the option of shifting to indefinites via the universal choice function encoded in the lexical entry of numerals across languages (c.f. Chapter 2).

One may wonder whether covert semantic type-shifting ARG is applicable to numeral classifier phrases or whether numeral classifier phrases can be shifted to definites via the covert type-shifter iota ‘\(\iota\)’ in the semantics. Indeed, similar questions have been addressed in Dayal (2013). Dayal (2013) explains why a covert application of iota ‘\(\iota\)’ in the semantics is unavailable for numeral phrases in languages with overt definite determiners like English; she also explains why it is also ruled out for numeral phrases in languages without Ds like Hindi. Specifically, a derivation like (16) is banned due to Blocking Principle (c.f. (8b)) by the lexical definite determinant (e.g. the in 'the three boy'). However, in languages without Ds such as Hindi, a covert application of iota is predicted incorrectly to be possible for numeral phrases (17) due to Ranking of Meaning (c.f. (8a)).

\[
(16) \text{English: } \left[\text{CardP three} \llbracket \text{NP boys} \rrbracket \right] = \lambda x \left[3(x) \land \text{boys}(x)\right] = \text{blocked by ‘the’}
\Rightarrow \iota x[3(x) \land \text{boys}(x)]
\]
To rule out the possibility of applying the covert argumentizing operation $\iota$ to numeral phrases, Dayal assumes that the primary meaning of cardinals is that of a generalized quantifier, so if there is no overt determiner, there is no need to apply an iota operator to argumentize cardinal phrases. Following Dayal's (2013) assumption, numeral classifier phrases in classifier languages without D should denote properties (18i) or indefinites (18ii) and never definites (18iii).

Third, since this type of classifier language employs covert type-shifting ARG unrestrictedly, we should expect that their numeral-less ClPs [Cl N] can be freely turned into arguments via ARG (i.e. kind formation $\cap$, iota $\iota$, and existential closure $\exists$):

Given that argument formation of numeral-less ClPs in (19) involves covert shifting, Ranking of Meaning (c.f. (8a), as repeated in (20)), which applies to covert argumentizing operations, comes into play in order to decide which specific covert operation, 'kinds', 'definites', or 'indefinite' should apply.

---

4 Building on Dayal's (2013) assumption, perhaps we can hypothesize a general principle to block ARG from applying to numeral phrases across languages: if a nominal phrase has a predicative value of type $\langle e, t \rangle$ but also has an argumental value of type $\langle e \rangle$ or $\langle e, e, t, t \rangle$, then ARG cannot apply to it. This principle can be viewed as a part of Blocking Principle and may be universal. Such a principle perhaps can be related to economy considerations or computational efficiency. But clearly these remarks are speculative at this point.
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(20) **Ranking of Meaning: \{\cap, \iota\} > \exists \quad** (Chierchia 1998b, revised in Dayal 2004)

The kind interpretation of numeral-less classifier phrases should be ruled by the same principle that is at play with Nuosu Yi that exclude kinds (21a). Specifically, as discussed in Chapter 4, the semantics of singularity expressed by numeral-less classifier phrases clashes with the conceptual notion of a kind, which corresponds to the plurality of all instances of the property (Dayal 1992; Chierchia 1998b). Given that the option to shift numeral-less ClPs to argument with a kind interpretation is ruled out and that iota ranks higher than indefinites (20), the next option is to shift numeral-less ClPs into arguments with a definite interpretation via iota ‘\iota’ (21b). An implication drawn from Meaning of Ranking (20) is that we do not expect a classifier language without D to have numeral-less ClPs shifting to indefinites but not to definites since indefinites rank lower than definites. Because numeral-less ClPs can be turned into arguments via iota, the option to turn them into argument with an indefinite reading via existential closure \exists is unavailable (21c). In other words, we should not expect to find the following kind of classifier language: a D-less classifier language which only allows numeral-less ClPs to freely occur in argument position with only an indefinite but not a definite reading.

(21) Argumentizing numeral-less ClPs via ARG in languages without D

a. \(\cap[\text{Cl N}] = \cap(\text{AT}(\wedge \kappa))\), undefined for singular properties
b. \(\iota[\text{Cl N}] = \iota(\text{AT}(\wedge \kappa))\), definite
c. \(\exists[\text{Cl N}] = \exists(\text{AT}(\wedge \kappa))\), unavailable due to Ranking of Meaning \{\cap, \iota\} > \exists

Fourth, since this types of classifier languages also employ one-deletion to the numeral classifier phrase [one Cl N], they are expected to allow the process of eliding the numeral one at PF to derive the surface bare form of [Cl N], which should be attested just like that in Mandarin.

A classifier language that instantiates all the properties described above is Cantonese. Bare nouns in Cantonese behave similarly to those in Mandarin both in terms of interpretation and distribution, as shown in (22) (e.g. Cheng and Sybesma 1999; Wu and Bodomo 2009; Simpson et al 2011; Jiang 2012).

(22) Cantonese bare nouns behave like those in Mandarin

a. *gau zungi sek juk.*  
   dog like eat meat
   ‘Dogs love to eat meat.’  
   (Cheng and Sybesma 1999: 510-511)

b. *Wufei heoi maai syu.*  
   Wufei go   buy   book
   ‘Wufei went to buy a book/books.’  
   (Cheng and Sybesma 1999: 510-511)

c. *cam4 jat6 ngo5-dei6 heoi3 jat1 go3 fan1-lai5.*
   yesterday we                go       1     clf    wedding
   (Go3) \(\text{san1-loeng4 hou2 leng3.}\)
   clf  bride             very pretty
   ‘Yesterday we went to a wedding. The bride was beautiful.’  
   (Simpson et al 2011: 181)
Bare numeral classifier phrases in Cantonese have similar distribution and interpretations as those in Mandarin (Cheng and Sybesma 2005: 280). I provide two examples in (23).

(23) Cantonese numeral-classifier phrases behave like those in Mandarin

\[\text{a. ngo-dei baan jau ji-sap go nam-zai tung saam-sap go neoy-zai.}\]  
\[\text{(indefinite)}\]  
\[\text{Our class have twenty Cl boy and thirty Cl girls.}\]  
\[\text{‘Our class has twenty boys and thirty girls.’}\]

\[\text{b. John tung baat go neoy-zai hai go ting-ce-coeng.}\]  
\[\text{[(go1) baat3 go neoi-zai hou leng wo.]}\]  
\[\text{[*definite]}
\[\text{that eight Cl girl very pretty SFP}\]  
\[\text{‘John and eight girls are in the parking lot. Those eight girls are very pretty.’}\]

Cantonese allows numeral-less ClPs to freely appear in argument positions where they receive a definite interpretation, as shown in (24) (e.g. Cheng and Sybesma 1999; Wu and Bodomo 2009; Simpson et al 2011).

(24) Cantonese numeral-less ClPs are freely argumental with a definite reading

\[\text{a. bzek gau zungji sek juk.}\]  
\[\text{(definite)}\]  
\[\text{Cl dog like eat meat}\]  
\[\text{‘The dog likes to eat meat.’}\]

\[\text{b. ngo zungji tong zek gau waan.}\]  
\[\text{(definite)}\]  
\[\text{I like with Cl dog play}\]  
\[\text{‘I like to play with the dog.’}\]  
\[\text{(Cheng and Sybesma 1999: 511)}\]

In addition to possessing the three properties stated previously, Cantonese also allows the numeral one to be optional in the post-verbal position where it gives rise to an indefinite interpretation (Cheng and Sybesma 1999; Wu and Bodomo 2009):

(25) have (one) Cl car block-CONT Cl exit

\[\text{‘There is a car blocking the exit.’}\]  
\[\text{(Wu and Bodomo 2009: 496)}\]

This property is similar to that of Mandarin and perhaps can receive the same one-omission explanation advanced in Chapter 2.

A difference between Cantonese and Mandarin lies in whether their bare nouns can freely receive a definite interpretation: it has been reported that Cantonese bare nouns do not receive a definite interpretation while those in Mandarin do (e.g. Cheng and Sybesma 1999). However, as examined in Simpson et al (2011), if provided with certain contextual restrictions, bare nouns in Cantonese can still receive a definite interpretation. I will discuss this issue as well the variation in expressing definiteness via bare nouns in Section 5.4.
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Note that in addition to the proposed D-less analysis of numeral-less classifier phrases in Cantonese ((19) and (21), as repeated in (26)), there is an alternative analysis proposed in Simpson (2005) and Wu and Bodomo (2009) which stipulates that Cantonese possesses a null functional category D (27).

(26) D-less analysis of bare ClPs in Cantonese
i. ARG ClP = definite

\[ \begin{array}{c}
\text{Cl} \\
\text{NP}
\end{array} \]

ii. Argumentizing numeral-less ClPs via covert type-shifting ARG
a. \( \bar{\text{I}} [\text{NP Cl]} = \bar{\text{I}}(\text{AT}(\bar{k})), \) undefined for singular properties
b. \( \iota [\text{NP Cl]} = \iota(\text{AT}(\iota k)), \) definite
c. \( \exists [\text{NP Cl]} = \exists(\text{AT}(\exists k)), \) unavailable due to Ranking of Meaning \( \{ \bar{\text{I}}, \iota \} > \exists \)

(27) An alternative DP analysis: project DP above bare ClPs in Cantonese
a. DP = definite

\[ \begin{array}{c}
\text{D}_{\text{null}} \\
\text{NumP} \\
\text{Num} \\
\text{Cl} \\
\text{NP}
\end{array} \] \\
(\text{Simpson 2005: 14})

b. DP = definite

\[ \begin{array}{c}
\text{D} \\
\text{CIP} \\
\text{Cl} \\
\text{NP}
\end{array} \] \\
(\text{Wu and Bodomo 2009: 499})

By assuming a null D in Cantonese, Simpson (2005) analyzes definite numeral-less ClPs in Cantonese as undergoing head movement from Cl to Num to D, as shown in (27a). Wu and Bodomo (2009) adopt Simpson’s analysis and propose a similar account that takes classifiers to undergo head movement from Cl to D, as illustrated in (27b).

The DP analysis in (27) assumes that ‘either Spec DP or the D head must be overtly instantiated by some lexical element in order for the definite interpretation to be triggered/signaled, and that otherwise the DP will be interpreted as having a default indefinite value’ (Simpson 2005: 14). To gain the definite interpretation of the bare ClPs in Cantonese, a lexical element needs to move either to the Spec DP position or to the D head position. Since Cantonese does not allow the [NP-Cl] string, NPs in Cantonese cannot move to Spec DP as they do in other classifier languages (e.g. Bangla, to be presented in Section 5.3.2), Cantonese has to employ head movement moving Cl to the D head position, as shown in (27).

If we adopt this alternative null D analysis, we should expect the null D to merge freely with numeral classifier phrases in Cantonese in the same way it does with its numeral-less ClPs, as shown in (28).
(28) An alternative DP analysis: to project DP above numeral ClP in Cantonese

a. DP = definite

b. DP = definite

Applying the same DP analysis of numeral-less ClPs in (27) to numeral ClPs in (28), either the D head or the Spec DP position would have to be filled by a lexical element in order for the definite interpretation of the DP to be obtained. This could be accomplished in one of two ways: (i) by moving the numeral to the D head position if we assume numerals are in a head position as in Simpson (2005) (28a), or (ii) by moving the numeral to the Spec DP position if one adopt the view they are phrasal elements that merge with ClPs (28b).

Both possibilities provided by such a DP analysis in (28) expect Cantonese numeral classifier phrases to receive a definite interpretation. Nevertheless, empirical data have shown that numeral classifier phrases in Cantonese do not receive a definite interpretation (c.f. (23b)). This suggests that the DP-analysis for Cantonese might not be on the right track. Even if some additional assumptions are made to exclude the possibilities in (28) for Cantonese, a DP analysis like this would be no simpler than the proposed analysis in (26), according to which no invisible functional category D needs to be stipulated in order to account for nominal arguments in Cantonese.

A question that immediately arises is whether there are classifier languages that resemble Cantonese in allowing definite numeral-less ClPs as well as definite numeral ClPs, which is what the analysis in (28) predicts. We, indeed, do have such a classifier language—Vietnamese, that instantiates the DP-analysis in (28). A discussion of this language is given in Section 5.3.2.1.

In addition to making the correct predictions about classifier languages that do not have D but do have unrestricted semantic type-shifting ARG as well as one-deletion at PF, the analysis of Mandarin and Nuosu Yi further predicts that there should be another type of classifier language that lacks D and ARG as well as one-deletion: \([-D, -\text{ARG}_{\text{unrestricted}}, -\text{one-deletion}]\). I discuss this type of classifier language in the next section.

5.3.1.2 Classifier languages: \([-D, -\text{ARG}_{\text{unrestricted}}, -\text{one-deletion}]\)

In this type of classifier language, bare nouns as well as numeral classifier phrases should resemble those in Mandarin, but numeral-less classifier phrases should be totally banned (29). This prediction is instantiated by Southern Min, Japanese and Korean.
Variation in classifier languages

(29) Properties of \([-D, -\text{ARG}_{\text{unrestricted}}, -\text{one}-\text{deletion}]\) languages

<table>
<thead>
<tr>
<th>Properties</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Bare nouns should behave like those in Mandarin and Nuosu Yi</td>
<td></td>
</tr>
<tr>
<td>ii. Bare numeral classifier phrases should be both predicative and</td>
<td>argumental with only an indefinite reading</td>
</tr>
<tr>
<td>iii. numeral-less classifier phrases should be totally banned</td>
<td></td>
</tr>
</tbody>
</table>

In these languages, bare nouns should also behave like those in Mandarin in terms of distribution and interpretation: (i) they should refer to kinds with kind level predicate; (ii) they should receive a generic interpretation in generic sentences; (iii) they should have a narrow scope existential interpretation; and (iv) they should receive a definite interpretation (e.g. see Cheng and Sybesma 2005 for Southern Min, Nemoto 2005 and Izumi 2011 for Japanese, and Nemoto 2005 for Korean). Below, I provide examples from Southern Min and Japanese to illustrate.

(30) Southern Min bare nouns behave like those in Mandarin

a. *Gau ai lim zhui.*                                                   [generic]
   dog   like drink water
   'dogs like to drink water.'                                         (Cheng and Sybesma 2005: 268)
   'The dog/dogs like(s) to drink water.'                               

b. *I be bue zhu.*                                                     [existential]
   he want buy book
   'He would like to buy a book/books.' (Cheng and Sybesma 2005: 268)

c. *I ga teN lim liao a.*                                               [definite]
   he take soup drink PRF SFP
   'He finished the soup.'                                              (Cheng and Sybesma 2005: 268)

d. *khiong-liong choat-cheng liau.* [kind]
   dinosaurs are extinct PRF
   'Dinosaurs are extinct.'                                             

(31) Japanese bare nouns behave like those in Mandarin

a. *kuzira-wa honyuurui da.*                                           [generic]
   whale-TOP mammal-COP
   ‘Whales are mammals.’                                               (Nemoto 2005: 392)

b. *daremo-ga hon-o yonda.*                                           [existential]
   everyone-NOM book-ACC read
   ‘Everyone read books.’                                               (Nemoto 2005: 389)

c. *soto-in gakusei-ga imasu.*                                        [definite]
   outside-in student-NOM exist
   ‘There is/are a student/students outside.’
   *gakusei-wa totemo hutotteimasu.* [definite]
   student-TOP very fat-is
   ‘The student is very fat.’                                           (Nemoto 2005: 398)
   *‘The students are very fat.’                                        
d. inu-ga zetumetusita. [kind]
dog-NOM extinct.became
‘Dogs went extinct.’ (Izumi 2011: 481)

Numeral classifier phrases in Southern Min, Japanese and Korean also receive an indefinite interpretation, just as those in Mandarin (e.g. see Cheng and Sybesma 2005 for Southern Min; see Kakegawa 2000; Nemoto 2005; Watanabe 2006, 2010; Saito et al. 2008; Huang and Ochi 2010, 2014 for Japanese; see Lee 1989, 2000; K. Kim 2010 for Korean). Examples from Southern Min are given in (32).

(32) Southern Min numeral-classifier phrases behave like those in Mandarin
a. Ua siuN bue jit-bun zhu. [indefinite]
   I want buy one-Cl volume book
   'I would like to buy a book.' (nonspecific)
b. I ga jit-waN teN lim liao a. [indefinite]
   he take one-Cl box soup drink PRF SFP
   'He finished a bowl of soup.' (specific) (Cheng and Sybesma : 269)

Examples from Japanese are given in (33). In the nominal domain, the numeral and the classifier can appear in the post-nominal position, as in (33a); they can also appear in the pre-nominal position, in which they are linked to the noun by a genitive-like element -no (e.g. Kamio 1977; Kawashima 1994, 1998; Nakanishi 2003; Watanabe 2006; Huang and Ochi 2014), as in (33b). 6 These two types of phrases receive an indefinite interpretation.

5 In addition to allowing the above two nominal forms, Japanese also allows floating numeral classifier constructions in which the case marker is not placed on the whole numeral phrases containing the numeral and the classifier but on the nouns (e.g. Kamio 1977; Fujita 1993; Kawashima 1994, 1998; Muromatsu 1998; Y. Ishii 1999; Watanabe 2006; Huang and Ochi 2014):
(i) John-wa hon-o san-satsu kaita.
   John-TOP book-ACC 4-Cl wrote
   ‘John wrote four books.’ (Watanabe 2006: 244)

In this work, I only focus on the nominal phrases containing the numeral-classifier in (33) and will set the floating numeral classifier construction aside for further research.

6 Note that, although these two types of phrases both receive an indefinite interpretation, they do differ in their scope behaviors. Specifically, [Num Cl-no N] can receive both a specific interpretation and a non-specific interpretation (Nemoto 2005: 409; Huang and Ochi 2011, 2014) (i); whereas [N Num Cl] only receives a specific indefinite interpretation, not a non-specific one (Huang and Ochi 2011, 2014) (ii).

(i). a. daremo-ga san-satu-no hon-o yonda.
   everyone-NOM 3-Cl-GEN book-ACC read
   (a) For everyone there are three books such that s/he read. ∀ > 3 books
   (b) There are three books such that everyone read. 3 books > ∀ (Nemoto 2005: 409)
b. Ano byooin-ga san-nin-no kangohu-o sagasi-teiru (koto).
   that hospital-Nom three-Cl no nurse-ACC looking for-Asp fact
   ‘(the fact that) that hospital is looking for three nurses’ (specific, non-specific)
   (Huang and Ochi 2014: 58)
(ii). Ano byooin-ga kangohu san-nin-o sagasi-teiru (koto).
   that hospital-Nom nurse three-Cl- ACC looking for-Asp fact
   ‘(the fact that) that hospital is looking for three nurses’ (specific, *non-specific)
   (Huang and Ochi 2014: 58)
Japanese numeral-classifier phrases behave like those in Mandarin

a. John-wa hon san-satsu-o kaita. [N Num Cl: indefinite]
   John- TOP book 4-Cl-ACC wrote
   'John bought three books.'

b. John-wa san-satsu-no hon-o kaita. [Num Cl-no N: indefinite]
   John- TOP 3-Cl-LINK book-ACC wrote
   'John wrote four papers.' (Watanabe 2006: 244)

However, unlike in Mandarin where the PF one-deletion rule allows numeral-less ClPs to surface in certain post-verbal positions, these languages ban numeral-less ClPs in all positions (see Cheng and Sybesma 2005; Jiang 2012, 2015), as exemplified below.

Numeral-less classifier phrases banned in Southern Min

a. *jia gau be lim zhui. [*Cl N]
   Cl dog want drink water
   Intended: ‘The dog wants to drink water.’

b. *ua siuN bue bun zhu. [*Cl N]
   I want buy Cl book
   Intended: ‘I would like to buy a book.’ (Cheng and Sybesma 2005: 208)

Numeral-less classifier phrases banned in Japanese

a. *kodomo ri-ga benkyoo shite-iru. [*N Cl]
   child Cl-NOM study do-be
   Intended reading: ‘A/The child is studying.’

b. *John-wa hong satsu-o katta. [*N Cl]
   John-Top book Cl-ACC bought
   Intended reading: ‘John bought a book.’

c. *ri-no kodomo ga benkyoo shite-iru. [*Cl-no N]
   Cl-LINK child-NOM study do-be
   Intended reading: ‘A/The child is studying.’

d. *John-wa satsu-no hong-o katta. [*Cl-no N]
   John-Top Cl-LINK book-ACC bought
   Intended reading: ‘John bought a book.’

Regarding the structure of Southern Min numeral classifier phrases (c.f. (32)), we can extend the proposed analysis of Mandarin in Chapter 2 (Section 2.4) to account for it:

The proposed analysis of numeral classifier phrases in Chapter 2 predicts the scope behavior of [Num Cl-no N] phrases in (i); however, the scope behavior of [N Num Cl] would need further explanations, which I leave for future research.
Variation in classifier languages

(36) Southern Min bare numeral classifier phrases: CIPs
i. property-denoting
   a. CIP<e,t>

   NumP
   jit 'one' CIP
   bun 'book'

   b. Numeral= λPλx [n (x) ∧ P(x)]

ii. indefinite
   a. CIP<e>

   NumP
   jitf 'one' CIP
   bun 'book'

   b. Numeral = λPFxλx [n (x) ∧ P(x)]

As for Japanese, although it shares the same properties in (29) with Southern Min, it allows the numeral-classifier to appear in different positions in the nominal domain, deriving different types of phrases, as seen in (33). Prima facie, the different types of numeral classifier phrases in Japanese do not follow directly from the proposed analysis of Mandarin and Nuosu Yi; however, as we shall see, the facts in Japanese as well as the analysis of them, as proposed in Watanabe (2006), are compatible with our analysis.

Watanabe (2006) argues for a unified analysis of various phrases containing a bare numeral-classifier, which involves massive phrasal movement within the nominal projection. Specifically, Watanabe argues for the following basic structure in (37), based on A. Li's (1999) analysis of numerals (in Spec ClP) and Fukui and Takano’s (2000) analysis that a classifier occupies the same head position as number morphology # in English does.

(37) Basic structure of numeral classifier phrases in Japanese

#P

numerical

san '3'

NP 'book' (Watanabe 2006: 253)

Crucially, the syntactic analysis of numerals and classifiers adopted in Watanabe (2006) in (37) is also the one that I adopted and argued for in Chapter 2 (Section 2.4) for numeral-(classifier)-noun phrases across languages:

(38) a. the structure of argumental/predicative numeral-(classifier-) noun phrases

DivP (CIP)

NumP Div' (C')

n(f) Div0 (C) NP

b. Lexical view of ambiguous numerals

i. Numeral<e,t>,<e,t> = λPλx [n (x) ∧ P(x)]
Variation in classifier languages

ii. Numeral_{<e, t>, <e>} = \lambda P f_{3}(\lambda x [n(x) \wedge P(x)])

If [[\alpha]] \in \text{Num}_{<e, t>, <e, e>}, then \lambda P f_{3}(\lambda x [n(x) \wedge P(x)]) \in \text{Num}_{<e, e>, <e, e>}

f_{3} is subject to existential closure at arbitrarily chosen scope sites.

To derive \([\text{N Num Cl}]\) (33a) and \([\text{Num Cl-no N}]\) (33b) from the structure in (37), Watanabe (2006: 253-256) argues for the two structures in (39). One involves cyclic NP movement to Spec of CaseP (39a), which derives (33a), and the other involves raising #P further to Spec of QP (39b), which derives (33b). Watanabe further argues that insertion of no after the classifier in (33b) is a matter of morphology and is not represented structurally.

(39)

a. Japanese numeral-classifier phrases [N Num Cl]: CaseP

\[
\text{CaseP} \\
\text{NP}_{i} \\
\text{hon} \quad \#P \\
'three' \quad t_{i} \\
\text{satsu} \\
\text{'book'} \\
\text{o} \\
\text{Case} \\
\text{Spec} \quad \text{DP} \\
\text{Spec} \quad \text{DP}
\]

(Watanabe 2006: 254)

b. Japanese numeral-classifier phrases [Num Cl-no N]: QP

\[
\text{QP} \\
\text{NP} \\
\text{satsu} \quad \#P_{j} \\
\text{'book'} \quad t_{j} \\
\text{Case} \\
\text{Spec} \quad \text{DP} \\
\text{Spec} \quad \text{DP}
\]

(Watanabe 2006: 255)

As we can see, although the proposed analysis of Mandarin and Nuosu Yi does not derive the structure of different types of numeral classifier phrases in Japanese directly, our analysis is consistent with the analysis of Japanese proposed in Watanabe’s (2006).

In this section, we saw that the proposed analysis of Mandarin and Nuosu Yi developed in the previous chapters correctly predicts the behaviors of bare nominal arguments in Southern Min and Japanese; in addition, it can derive different types of numeral classifier phrases in Japanese in a coherent principled manner as in (39).\(^7\)

\(^7\) Watanabe (2006) also discusses two more types of numeral classifier phrases, one of which involves floating numeral classifier, as discussed in footnote 5. Watanabe argues for further steps of movement on the top of (38b) to derive their structures (i.e. (i) move CaseP to Spec DP, and (ii) to scramble the numeral-classifier out of DP). I will set aside these two additional types of phrases containing the numeral-classifier for further research and refer the readers to Watanabe (2006: 256-258) for the details. Different from Watanabe (2006), who argues for a unified analysis of various types of phrases containing the numeral-classifier, some scholars argue for a non-uniform analysis (e.g. see Huang and Ochi 2011, 2014).
In the next section, we will discuss the predictions about the third type of classifier language without D [\(-D, +\text{ARG}_{\text{unrestricted}}, -\text{one-deletion}\)] as well as languages that instantiate them.

### 5.3.1.3 Classifier languages: \([-D, +\text{ARG}_{\text{unrestricted}}, -\text{one-deletion}\)]

Classifier languages without D or one-deletion but with ARG\textsubscript{unrestricted} should have the following properties:

\begin{itemize}
  \item[i.] Bare nouns should behave like those in Mandarin and Nuosu Yi
  \item[ii.] Bare numeral classifier phrases should be both predicative and argumental with only an indefinite reading
  \item[iii.] Numeral-less classifier phrases should be freely allowed, but only with a definite interpretation.
\end{itemize}

I will elaborate these properties of this type of classifier language below. One, their bare nouns and numeral classifier phrases should resemble those in Mandarin in terms of distribution and interpretation. Two, given that this type of classifier language employs covert type-shifting ARG unrestrictedly, their numeral-less classifier phrases should be freely allowed in argument positions, with a definite reading not a indefinite or a kind reading. Specifically, the kind interpretation of numeral-less classifier phrases is ruled out by the same principle that is at play with Nuosu Yi and Cantonese that exclude kinds (41a); numeral-less ClPs can be turned into arguments with a definite interpretation via iota (41b); numeral-less ClPs cannot be turned into arguments with an indefinite interpretation due to Ranking of Meaning (c.f. (20)) (41c).

\begin{itemize}
  \item[i.] \(\sim [\text{Cl N}] = \text{undefined for singular properties}\)
  \item[ii.] \(\imath [\text{Cl N}] = \text{definite}\)
  \item[iii.] \(\exists [\text{Cl N}] = \text{unavailable due to Ranking of Meaning \{\sim, \imath\} \succ \exists (20)}\)
\end{itemize}

Three, since this types of classifier languages does not employ one-deletion to their [one Cl N] phrase to derive the surface bare form of [Cl N], we should not expect their numeral-less classifier phrases to receive an indefinite interpretation. In other words, this type of classifier language should resemble Cantonese (c.f. Section 5.3.1.1) in many respects (i.e. bare nouns, numeral classifier phrases, unrestricted definite numeral-less ClPs) but differ from it in banning indefinite numeral-less classifier phrases.

A classifier language that instantiates all the properties described above is Bisu. Bisu is spoken in Southern Yunnan, China, as well as in the border areas of China, Thailand, Myanmar, and Laos; it is a head final language and belongs to the Bisoid branch in the Burmese-Yipho group of languages within the Tibeto-Burman family (Xu 2001: 4-5). Bare nouns in Bisu behave similarly to those in Mandarin both in terms of interpretation and distribution, as exemplified below.
Bisu bare nouns behave like those in Mandarin

- **a.** 
  \[
  \text{tsa}^{55} \text{ tɕhit}^{31} \text{ pijam}^{55} \text{ khi}^{31}, \text{ a}^{31} \text{kau}^{31} \text{ ba}^{31} \text{ pijam}^{55} \text{ khi}^{31}.
  \]
  (generic)
  'Sparrow can fly; ducks cannot fly.'
  (Xu 2001: 150)

- **b.** 
  \[
  \text{lo}^{55} \text{khu}^{31} \text{ khau}^{55} \text{ pha}^{31} \text{ ba}^{31} \text{ tsam}^{33}.
  \]
  (existential)
  'There are no vegetables on the plates.'
  (Xu 2001: 138)

- **c.** 
  \[
  \text{aŋ}^{33} \text{lai}^{31} \text{ ma}^{31} \text{ fu}^{33} \text{ʑa}^{31} \text{ thi}^{31} \text{ ba}^{31} \text{ aŋ}^{33} \text{ sɿ}^{31} \text{ pi}^{31}.
  \]
  (definite)
  'The teacher gave the child(ren) some new books.'
  (Xu 2001: 87)

Bisu is a classifier language (Xu 2001; Y. Li 2008); the numeral and the classifier usually follow the noun, and the [N Num Cl] phrase receives an indefinite interpretation (43i) (Xu 2001: 77).

**i.** Bisu numeral-classifier phrases behave like those in Mandarin

- **a.** 
  \[
  \text{zaŋ}^{33} \text{ zo}^{31} \text{ pon}^{31} \text{ ni}^{31} \text{ fu}^{33} \text{ aŋ}^{33} \text{ tsam}^{33}.
  \]
  (N Num Cl: indefinite)
  'He has two boys.'
  (Xu 2001: 108)

- **b.** 
  \[
  \text{za}^{31} \text{ bi}^{31} \text{ xan}^{55} \text{ fu}^{33} \text{ zo}^{31} \text{ la}^{55} \text{ aŋ}^{55}.
  \]
  (N Num Cl: indefinite)
  'Four girls are coming towards here.'
  (Xu 2001: 108)

**ii.** Bisu numeral-classifier phrases behave like those in Mandarin

- **a.** 
  \[
  \text{ni}^{31} \text{ maŋ}^{55} \text{ a}^{31} \text{ maŋ}^{31} \text{ a}^{55} \text{ mu} \text{ aŋ}^{33} \text{ tsam}^{55} \text{ tsam}^{31} \text{ sɿ}^{31} \text{ sɿ}^{31}.
  \]
  (Num Cl N: indefinite)
  'Two cows are eating grass.'
  (Xu 2001: 75-76)

- **b.** 
  \[
  \text{thi}^{31} \text{ tsum}^{55} \text{ za}^{31} \text{ bi}^{31}.
  \]
  (Num Cl N: indefinite)
  'One group of girls'
  (Chen 2008: 88)

Interestingly, the numeral and the classifier may also precede the noun in Bisu (43ii) (Xu 2001: 75-76; Chen 2008: 88-89).  

The two different word orders in (43i) and (43ii) do not change the interpretation of the numeral classifier phrases in Bisu; however in Section 5.3.2.4, we will see that different word orders of the numeral, the classifier and the noun in another classifier language, i.e. Bangla, do give rise to different interpretations.

In addition to numeral classifier phrases, Bisu also allows numeral-less ClPs to freely appear in argument positions, with a definite interpretation only (Xu 2001: 109; Y. Li 2008: 85):

---

8 According to Li (2008: 88), group classifiers are more likely to appear in the [Num Cl N] phrase, but some individual classifiers can also appear in this phrase.
Variation in classifier languages

(44)  a. $pe^{33}le^{31}manj^{55}$
      sheep Cl
      'the sheep'  

b. $pa^n^{33}na^{33}manj^{55}$
      cow Cl
      'the cow'

(44c) $tsa^{55}t\text{chit}^{31}manj^{55}ba^{31}pjam^{55}$.
      sparrow Cl not fly
      'That sparrow has not flown away.'

(Y. Li 2008: 85)

Xu 2001: 109

Regarding the definite numeral-less classifier phrases in Bisu, the analysis of Cantonese (c.f. (26)) can be extended to account for the fact. As for the structure of the bare numeral classifier phrases in Bisu (c.f. (43)), we can extend the proposed analysis of Mandarin (c.f. Chapter 2, Section 2.4) and that of Nuosu Yi (c.f. Chapter 4, Section 4.8.2) to account for it:

(45) Bisu bare numeral classifier phrases: CLPs

a. $[\text{Num Cl N}]_{\text{indefinite}}$
   
   CIP
   
   NumP $ni^{31}$
   'two'
   Cl $manj^{55}$
   'cow'
   
   b. $[N \text{ Num Cl}]_{\text{indefinite}}$
   
   CIP
   
   NumP $ni^{31}$
   'two'
   Cl $fu^{33}$
   t
   
   Notation:...

The NP movement seen in (45b) draws on Simpson (2005: 309-323), where such movement can be used to account for cross-linguistic variation in the ordering of constituents in the classifier phrases (c.f. Chapter 4, Section 2.4).

The chart in (46) summarizes the classifier languages captured so far by the analysis of Mandarin and Nuosu Yi.

(46) Classifier languages attested with $[-D, \pm\text{ARG}_{\text{unrestricted}}, \pm\text{one-deletion}]$ parameters

<table>
<thead>
<tr>
<th>Classifier language</th>
<th>D</th>
<th>ARG_{unrestricted}</th>
<th>One-deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Mandarin,</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>(ii) Cantonese</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(iii) Japanese, Korean, Southern Min</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(iv) Bisu</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
</tbody>
</table>

9 Note that, although the English translation of the numeral-less CIP given in (45c) is a demonstrative phrase 'that sparrow', there is no demonstrative in the sentence; the more accurate translation of the phrase should be 'the sparrow'.

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In Section 5.3.2, I turn to the discussion on the classifier languages that instantiate the types in (47), which are [+D, ±ARG, ±one-deletion].

\[(47) \quad \text{Predicting classifier languages with } [+D, \pm \text{ARG}_{\text{unrestricted}}, \pm \text{one-deletion}] \]

<table>
<thead>
<tr>
<th>Classifier language</th>
<th>D</th>
<th>ARG</th>
<th>One-deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(v) Nuosu Yi</td>
<td>+</td>
<td>+</td>
<td>−</td>
</tr>
<tr>
<td>(vi) Thai</td>
<td>+</td>
<td>−</td>
<td>−</td>
</tr>
<tr>
<td>(vii) Vietnamese</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(viii) ?</td>
<td>+</td>
<td>−</td>
<td>+</td>
</tr>
</tbody>
</table>

5.3.2 Predicting other classifier languages with D

In Chapter 4, I discussed in detail a classifier language that both has the functional category D and employs type-shifting in the semantics unrestricted (ARG), namely Nuosu Yi. In this section, I start with the predictions about classifier languages that possess the functional category D in the grammar but do not employ semantic type-shifting ARG unrestrictedly or one-deletion at PF: [+D, −ARG_{unrestricted}, −one-deletion]. The predictions about the other two types of classifier languages with D will be taken up in Section 5.3.2.2 and Section 5.3.2.3. In Section 5.3.2.4, I will discuss a classifier language similar to Nuosu Yi, which further instantiates the type of languages that are [+D, +ARG_{unrestricted}, −one-deletion].

5.3.2.1 Classifier languages: [+D, −ARG_{unrestricted}, −one-deletion]

A classifier language that has the functional category D but does not employ type-shifting in the semantics unrestrictedly or one-deletion at PF should have the following properties:

\[(48) \quad \text{Properties of } [+D, \neg \text{ARG}_{\text{unrestricted}}, \neg \text{one-deletion}] \text{ languages} \]

| Properties                                                                                     |
| i. Bare nouns should behave like those in Mandarin and Nuosu Yi                               |
| ii. Bare numeral classifier phrases should resemble those in Mandarin, Nuosu Yi, and other languages in having both a predicative use and an argumental use with an indefinite interpretation. |
| iii. numeral-less classifier phrases should be banned by virtue of lacking the one-deletion rule at PF as well as unrestricted type-shifting in the semantics. |
| iv. The functional category D should act on numeral classifier phrases, turning them into arguments with a definite interpretation. |

The first two properties in (48) are uniform across classifier languages; the third property in (iii) is also attested in classifier languages [−D, −ARG_{unrestricted}, −one-deletion], such as Southern Min, Japanese and Korean (c.f. Section 5.3.1.2). Below I will elaborate the fourth property (48iv).
Since this type of classifier language has the functional category D, we expect it to act on property-denoting phrases. Here, the only property-denoting phrase relevant to our discussion is the numeral classifier phrase, so we should expect D to combine with it, shifting it to definites (49i). In addition, as argued in Chapter 2, the indefinite interpretation of bare numeral containing phrases is attributed to the universal choice function (f_3) encoded in the lexical entry of numerals across languages, regardless of whether they have overt D or not and regardless of whether they are classifier languages or number marking ones. Hence, we should expect a D-less structure of the indefinite bare numeral classifier phrases in this type of classifier language as well (49ii). In other words, we should expect that bare numeral classifier phrases in this type language can be turned into arguments with either an indefinite or a definite interpretation, like those in Nuosu Yi.

(49) Numeral classifier phrases in languages with D
i. definite numeral ClPs via D
   a. DP_{<e>}
   b. Numeral = \lambda P \lambda x [n(x) \land P(x)]

D_{def}

ClP_{<e,t>}

NumP

Cl'

n

Cl

NP

ii. indefinite numeral ClPs via f_3
   a. ClP_{<e>}
   b. Numeral = \lambda P f_3(\lambda x [n(x) \land P(x)])

NumP

Cl'

n f_3

Cl

NP

Note that since bare nouns in classifier languages denote kinds (c.f. Chapter 2), we expect D not to combine with them due to a type-mismatch caused by the fact that its sister needs to be a property in order to return an entity (c.f. Chapter 4). So the functional category D in this type of classifier language should also be incompatible with bare nouns.

A classifier language that instantiates all the properties described above is Thai. Thai bare nouns exhibit all the properties of a classifier language where bare nouns denote kinds and all other interpretations are derived from kinds (Piriyawiboon 2010), as shown in (50).

(50) Thai bare nouns behave like those in Mandarin
   a. nuu kli ai suunpan  [kinds]
      mouse almost extinct
      ‘Mice are almost extinct.’
   b. nuu aasai taam thonaam  [generic]
      mouse live in sewer

250
‘Mice live in the sewer.’

c. chan mai  hen maew nai hong  
I  NEG see  cat  in  room  
i) ‘I didn’t see cats in the room.’  
[not > ∃; *∃>not]  
ii) ‘I didn’t see the cat in the room.’  
[narrow scope existential]  
d. muawaan nnu  khaw maa nai khrua  
yesterday mouse enter come in kitchen  
wannii nnu  haay pai laew  
today mouse disappear ASP already  
‘Yesterday, a mouse/mice came in the kitchen. Today, the mouse/mice disappear.’  
(Piriyawiboon 2010, 42-45, (2), (7a))

Numeral-less classifier phrases are disallowed in Thai (Jenks 2011), as illustrated in (51).

(51)  Thai numeral-less ClPs are disallowed  
*th’uirian l’uuk  
Durian  Cl  
[*N Cl]  
(Jenks 2011: 233, ex (54a))

Thai numeral classifier phrases receive a default an indefinite interpretation, but they can also be interpreted as definite if contexts are provided. (Kookiattikoon 2001, Piriyawiboon 2010), as illustrated in (52).

(52)  Thai numeral classifier phrases are ambiguous  
a. nakrian song-khon ma laew  
student two Cl come already  
(i) ‘The two students already came.’  
(definite)  
(ii) ‘Two students already came.’  
(indefinite)  
(Kookiattikoon 2001: 52, ex(49))  
b. chan hen phuuchai saam khon  
I see man three Cl  
‘I saw (the) three men.’  
(definite)/[indefinite]  
(Piriyawiboon 2010, 77 (33))

In (53), I give an analysis of the numeral classifier phrase nakrian song khoni ‘student two Cl’ in (52), along the same line as the analysis of Nuosu Yi proposed in Chapter 4. Specifically, the universal choice function in the lexical entry of numerals (53a) turns the numeral classifier phrases to indefinites (53c, e), and it is the functional head D_{def} that shifts the property-denoting numeral ClPs to definites (53d, f).

(53)  Thai ambiguous Num-ClPs  
a. Numeral_{<,>,<,>,e} = λPf_∃(λx [n (x) ∨ P(x)])  
b. Numeral_{<,>,<,>,e} = λPλx [n (x) ∨ P(x)]
Variation in classifier languages

\[
c. [\text{nakrian song khon}] = f_3(\text{AT(}\neg\land\text{students})(x) \land 2(x)) \quad \text{[indefinite]}
\]

\[
d. [\text{nakrian song khon}] = 1(\text{AT(}\neg\land\text{students})(x) \land 2(x)) \quad \text{[definite]}
\]

\[
f. \quad \text{DP}_{\text{def}} = \text{definite}
\]

\[
e. \quad \text{CIP} = \text{indefinite}
\]

\[
f. \quad \text{D'}
\]

\[
\text{NP}_i \quad \text{nakrian} \quad \text{Cl'}
\]

\[
\text{song}_{f_{3}} \quad \text{Cl}\quad t_i
\]

\[
\text{song}_{f_{3}} \quad \text{Cl}\quad t_i
\]

The same as Nuosu Yi (Chapter 4), the NP movement seen above draws on Simpson (2005: 309-323), where such movement is used to account for cross-linguistic variation in the ordering of constituents in the classifier phrases of South East Asian languages.

As we can see, the behavior of Thai nominals, as presented above, falls nicely within our predictions. Although Thai does not have a dedicated definite determiner like \textit{su} in Nuosu Yi, it has a covert \text{D}_{\text{def}} that can turn numeral CIPs into arguments with a definite interpretation. The numeral CIPs, therefore, can be turned into arguments via different sources which lead to different interpretations; the only word order [N Num Cl] in Thai according to the analysis in (53) has two different underlying structures. The phrases containing numerals without D denote indefinites uniformly across languages (53e), and it is only when D is in the grammar of a language that numeral-containing phrases can be shifted to definites (i.e. via D) (53f).

In addition to making the correct predictions about classifier languages that do have the functional category D but do not employ type-shifting in the semantics unrestrictedly or one-deletion at PF, i.e. [+D, −ARG\text{unrestricted, −one-deletion}], the analysis of Mandarin and Nuosu Yi further predicts that there should be a type of classifier language that has D and also employs type-shifting in the semantics unrestrictedly as well as one-deletion at PF: [+D, +ARG\text{unrestricted, +one-deletion}]. This type of classifier language will be discussed in the following section.

5.3.2.2 Classifier languages: [+D, +ARG\text{unrestricted, +one-deletion}]

In this type of classifier language, we expect to observe the following five main properties:
Variation in classifier languages

(54) Properties of [+D, +ARG(unrestricted), +one-deletion] languages

Properties

i. Bare nouns should behave like those in Mandarin and Nuosu Yi
ii. Bare numeral classifier phrases should resemble those in Mandarin, Nuosu Yi, and other languages in having both a predicative use and an argumental use with an indefinite interpretation.
iii. numeral-less classifier phrases should be freely allowed in argument position as a result of apply ARG unrestrictedly.
iv. The functional category D should act on both the numeral classifier phrase level and the numeral-less classifier phrase level
v. one-deletion should be expected to apply to its classifier phrases during the process of externalization in the PF.

A classifier language that instantiates all the properties described above is Vietnamese. Bare nouns in Vietnamese behave similarly to those in Mandarin and Nuosu Yi in terms of interpretation and distribution (Nguyen 2004; Simpson et al. 2011; Trinh 2011), as illustrated below.

(55) Bare nouns in Vietnamese behave like those in Mandarin

a. Chó cắn nhau. [generic]
dog bite each other
‘Dogs fight against each other.’ (Nguyen 2004: 18)
b. Tôi trông thấy hổ. [existential]/[definite]
I look see tiger
‘I saw (a/the) tiger(s).’ (Nguyen 2004: 2)
c. Cửa sổ co bị đong không? [definite]
window be pass close q
‘Is the window closed?’ (Simpson et al. 2011: 177)

Bare numeral classifier phrases in Vietnamese receive a default indefinite interpretation, behaving like those in Mandarin and Nuosu, but they can further receive a definite interpretation if a specific context is given (Trinh 2011; Jiang 2012):

(56) Vietnamese Num-ClPs: either indefinite or definite

a. Tôi gặp hai dua con-gai hom-qua
I meet two Cl girl yesterday
(i) ‘I met two girls yesterday.’
(ii) ‘I met the two girls yesterday.’ (When talking about two girls in the context)
b. Có hai dua con-trai va hai dua con-gai ngoi trong lon,
There two Cl boy and two Cl girl sit in class,
hai dua con-trai trong khoang 14 tuoi.
two Cl boy look approx 14-year
‘There are two boys and two girls sitting in the classroom, the two boys look like 14-year old’ (Jiang 2012: 417)
The indefinite interpretation of numeral classifier phrases can be accounted for via the default type-shifter, the universal choice function ($f_\exists$) encoded in the lexical entry of numerals, which turn the bare numeral containing phrases into indefinites (c.f. Chapter 2); such indefinite numeral classifier phrases should have a D-less structure (57a). On the other hand, the account for how the definite interpretation of bare numeral classifier phrases comes about is the same as for Thai: their definite interpretation must be gained through a null definite D in the syntax, which shifts numeral classifier phrases to definites. If one adopts the DP analysis in Longobardi (1994), either Spec DP or the D head must be overtly instantiated by some lexical element in order for the definite interpretation to be triggered. In the case of numeral classifier phrases, this can be done by moving the numeral phrase to the Spec DP position (57b).

(57) Vietnamese ambiguous numeral classifier phrases

\[
\begin{align*}
  a. & \quad \text{CIP = indefinite} \\
  & \quad \text{NumP} \quad \text{hai}_\exists \\
  & \quad \text{Cl'} \\
  & \quad \text{NP} \quad \text{dua} \quad \text{con-gai} \\
  & \quad \text{'girl'} \\
\end{align*}
\]

\[
\begin{align*}
  b. & \quad \text{DP = definite} \\
  & \quad \text{D}_{\text{def}} \\
  & \quad \emptyset \\
  & \quad \text{CIP} \\
  & \quad \text{NumP} \quad \text{hai} \\
  & \quad \text{Cl} \\
  & \quad \text{NP} \quad \text{dua} \quad \text{con-gai} \\
  & \quad \text{'girl'} \\
\end{align*}
\]

\[
\begin{align*}
  c. \quad \text{Numer}_{\langle e,t,\cdot \rangle} = \lambda P f_\exists (\lambda x [n(x) \land P(x)]) \\
  d. \quad \text{Numer}_{\langle e,t,\cdot \rangle} = \lambda P \lambda x [n(x) \land P(x)] \\
  e. \quad [[[\text{hai dua con-gai}]]] = f_\exists (\text{AT} (\cap \cap \text{girls})(x) \land \exists (x)) = \text{(57a)} \quad \text{[indefinite]} \\
  f. \quad [[[\text{hai dua con-gai}]]] = \tau (\text{AT} (\cap \cap \text{girls})(x) \land \exists (x)) = \text{(57b)} \quad \text{[definite]}
\end{align*}
\]

The above null DP analysis of the definite numeral classifier phrase in Vietnamese resembles the DP analysis that Simpson (2005) and Wu and Bodomo (2009) propose for Cantonese definite numeral-less classifier phrases (Section 5.3.1.1, (27)). As we saw, although a null DP analysis of Cantonese numeral-less classifier phrases makes wrong predictions about their numeral classifier phrases (e.g. (28)), such an analysis does correctly capture the facts in Vietnamese, namely that both numeral classifier phrases and numeral-less classifier phrases in this language can receive a definite interpretation.

One may wonder whether there are classifier languages that resemble Vietnamese in allowing definite and indefinite numeral classifier phrases as well as exhibiting overt evidence of movement into Spec DP or the D head position (e.g. (27), (57b)). We, indeed, do have such a classifier language—Bangla, which provide visible evidence of the movement. A discussion of this language will be given in Section 5.3.2.4.

Turning back to Vietnamese, it allows numeral-less ClPs to freely appear in argument position, also with either a definite or an indefinite interpretation (Bisang 1999; Nguyen 2004; Simpson et al 2011; Trinh 2011):

(58) Vietnamese numeral-less ClPs: either indefinite or definite

\[
\begin{align*}
  & \quad \text{either indefinite or definite}
\end{align*}
\]
Variation in classifier languages

a. Con bò ān lúa kìa!
   CL cow eat paddy over there.
   ‘Look! A/The cow is eating your paddy!’

b. Mang cuÔn sách ra Cây.
   Bring CL book out here
   ‘Go get a/the book.’

(Nguyen 2004: 34)

In the case of definite numeral-less CIPs, we can posit, as above, the presence of a null definite D that turns numeral-less CIPs into definites (59i). The indefinite reading of bare CIPs, on the other hand, can be treated as the result of applying one-deletion in the PF freely (59ii).

(59) Vietnamese ambiguous numeral-less classifier phrases

i. a. DP = definite

\[
\begin{array}{c}
\text{D}_{\text{null}} \\
\text{CIP} \\
\text{CI} \\
\text{cuÔn} \\
\text{sách} \quad \text{’book’}
\end{array}
\]

b. \[[\text{cuÔn sách}]\] = \(\lambda x \left[\text{AT}^{\neg \text{girls}}(x)\right]\)

c. \[[D \text{cuÔn sách}]\] = \(\iota \left(\text{AT}^{\neg \text{girls}}\right)\)

ii. CIP = indefinite

a. Syntax

\[
\begin{array}{c}
\text{NumP} \\
\text{một} \\
\text{Cl} \\
\text{cuÔn} \\
\text{sách} \quad \text{’book’}
\end{array}
\]

b. PF

\[
\left[\text{một} \quad \text{Cl} \quad \text{N}\right]
\]

c. Numeral\(<\text{e,t}>\) = \(\lambda \text{P}_{\lambda x} (\lambda x \left[\text{n} \quad \text{P}(x)\right]\))

d. \[[\text{một}]\] = \(\lambda \text{P}_{\lambda x} (\lambda x \left[\text{P}(x)\right]\))

d. \[[\text{một cuÔn sách}]\] = \(\text{P}_{\lambda x} (\lambda x \left[\text{AT}^{\neg \text{books}}(x)\right]\))

Note that, similar to Cantonese (Section 5.3.1.1), whether or not Vietnamese allows its bare nouns to receive a definite interpretation is controversial in the literature. It has been reported that Vietnamese bare nouns do not receive a definite interpretation (Trinh 2011).

However, as discussed in Nguyen (2004) and examined and Simpson et al (2011), bare nouns in Vietnamese can receive a definite reading (55). This issue as well as the variation in expressing definiteness via bare nouns will be discussed in Section 5.4.

In addition to making the correct predictions about the above two types of classifier languages with D, i.e. [+D, \neg \text{ARG}_\text{unrestricted}, \neg \text{one-deletion}] languages and [+D, 
\neg \text{ARG}_\text{unrestricted}, +\text{one-deletion}] languages, the analysis of Mandarin and Nuosu Yi further predicts that there should another type of classifier language with D, [+D, \neg \text{ARG}_\text{unrestricted}, 
+\text{one-deletion}], which does not employ type-shifting in the semantics freely but does
employ one-deletion in the PF. I will discuss the predictions about this type of languages in the following section.

5.3.2.3 Classifier languages: [+D, −ARGunrestricted, +one-deletion]: ?

In [+D, −ARGunrestricted, +one-deletion] classifier languages, we expect to observe the following five properties.

(60) Properties of [+D, +ARGunrestricted, +one-deletion] languages

<table>
<thead>
<tr>
<th>Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Bare nouns should behave like those in Mandarin and Nuosu Yi</td>
</tr>
<tr>
<td>ii. Bare numeral classifier phrases should resemble those in Mandarin, Nuosu Yi, and other languages in having both a predicative use and an argumental use with an indefinite interpretation.</td>
</tr>
<tr>
<td>iii. numeral-less ClPs are not freely allowed as a result of not employing type-shifting in the semantics unrestrictedly</td>
</tr>
<tr>
<td>iv. The functional category D should merge with numeral classifier phrases, turning them into arguments with a definite interpretation.</td>
</tr>
<tr>
<td>v. one-deletion should be expected to apply to its numeral classifier phrases during the process of externalization in the PF to derive numeral-less classifier phrases in (restricted) argument position.</td>
</tr>
</tbody>
</table>

Note that, in this type of classifier language, when numeral-less classifier phrases appear in argument position, they should not receive a definite interpretation but only an indefinite interpretation since the surface [Cl N] (or [N Cl]) is the result of omitting numeral one.

So far, I am not aware of a classifier language which can instantiate all the properties above; however, the analysis of Mandarin and Nuosu Yi predicts the existence of such a language. It remains to be seen whether this prediction is borne out as classifier languages are investigated further.

As we can see, the analysis of Mandarin and Nuosu Yi and the three parameters, [+D], [+ARGunrestricted], and [+one-deletion], predict eight types of classifier languages, most of which are indeed attested:
Before I end the discussion on the predictions about classifier languages, I would like to discuss one language which is similar to the typologically rare language Nuosu Yi, namely, Bangla. I will show in the next section that, Bangla is also a \([+D, +\text{ARG}_\text{unrestricted}, -\text{one-deletion}]\) classifier language.

### 5.3.2.4 One classifier language similar to Nuosu Yi

Chapter 4 examined and discussed the nominal phrases in Nuosu Yi, a head-final classifier language which has an overt definite determiner. This section discusses Bangla, which has already been argued to have a D (Dayal 2010, 2011b, 2012; Simpson et al 2011, Simpson and Syed 2016). Bangla belongs to the Indo-Aryan languages within the Indo-European family. Similarly to Nuosu Yi, Bangla is a head final classifier language with SOV word order.

Bangla bare nouns behave similarly to those in Mandarin and Nuosu Yi in terms of distribution and interpretation (Dayal 2010, 2011b, 2012; Simpson et al 2011):

(62) Bare nouns in Bangla behave similarly to those in Mandarin

a. *panchodO Sotabdi-te boi chapa Suru hoichilo.*
   \(\text{[kinds]}\)
   \(\text{fifteen century-LOC book printed start happen}\)
   ‘Books started to be printed in the 15\textsuperscript{th} century.’

b. *gari petro e chole.*
   \(\text{[generic]}\)
   \(\text{car petro on run}\)
   ‘Cars run on petrol.’

c. *ami ei rastay kal rate gari dekheilam.*
   \(\text{[existential]}\)
   \(\text{I this road-LOC yesterday night car saw}\)
   ‘I saw a car/cars on this road last night.’ (Dayal 2012)

d. *janla(-Ta) ki bOndho ache?*
   \(\text{[definite]}\)
   \(\text{window(-clf) q closed be}\)
   ‘Is the window closed?’
   \(\text{[Context for using bare nouns: if the speaker assumes that there is only one window in the room]}\) (Simpson et al 2011)
Without a classifier, a numeral cannot directly combine with a noun (Bhattacharya 1999a, b; Dayal 2010, 2011b, 2012).

In Bangla, without a classifier, a numeral cannot directly combine with a noun (Bhattacharya 1999a, b; Dayal 2010, 2011b, 2012):

(63) a. kal ɛk *(-ʈa) / du *(-ʈo) tʃʰatro eʃe tʃʰilo.
    yesterday one CL two CL student came
    “Yesterday a student/two students came.”

b. anu ɛk *(-ʈa) / du *(-ʈo) boi kineʃʰilo.
    Anu one CL two CL book bought
    “Anu bought a book/two books.” (Dayal 2012)

Dayal (2012, 2014) discusses six main types of classifiers in Bangla:

(64) Types of classifiers in Bangla
a. general classifiers for count nouns: –ʈa/ʈo/ʈe
b. classifier restricted to humans: –jɔn

c. classifier restricted to inanimate count nouns: -kʰana
d. number-neutral classifier restricted to animate nouns: –ra

e. plural classifier applicable to all count and mass nouns: -gulo
f. classifier restricted to mass nouns:–kʰani (Dayal 2012)

In the discussion below, I will focus on the general classifiers for count nouns (64a).

Two word orders are available for numeral classifier phrases in Bangla. One word order has the numeral-classifier preceding the noun [Num Cl N] (with numeral-classifier underlined); this order is similar to the one Mandarin uses. The other word order has numeral-classifier following the noun [N Num Cl]; this is the word order that Nuosu Yi adopts. These two word orders of Num-CIPs in Bangla correspond to two different interpretations: [Num Cl N] gives rise to an indefinite interpretation, whereas [N Num Cl] receives a definite interpretation (Bhattacharya 1999a; Dayal 2010, 2011b, 2012):

(65) a. ami du-To boi dekhechi. [Num Cl N]
    I two-CL book seen-1P
    ‘I have seen two books’

b. ami boi tu-to dekhechi. [N Num Cl]
    I book two-CL seen-1P
    ‘I have seen the three books’ (Bhattacharya 1999a: 81-82)

As illustrated in Dayal (2010, 2011b, 2012), Bangla [N Num Cl] constructions show a maximality effect (66a), the typical characteristics of definites (e.g. Hawkins 1978; Lewis 1979; Heim 1982; Kadmon 1990), and cannot receive an intermediate scope interpretation (66b), a key characteristics of indefinites (e.g. Farkas 1981; Ruys 1992; Winter 1997, 2001a, 2005; Kratzer 1998; Ionin and Matushansky 2006, c.f. Chapter 2).

---

10 To and Te are allomorphs of the general classifier Ta in Bangla (Dasgupta 1983: 11-13).
Variation in classifier languages

(66) [N-Num-Cl]: definite
a. \textit{tin \textipa{te} tf'atro eʃe tʃʰilo}. \textit{#tf'atro du \textipa{fo} boʃlo}. \textit{[maximality required]}
three CL student came student two CL sat down
Intended: ‘Three students came. Two (of the) students sat down.’
b. \textit{protek-tf'atro bifoy-e \textipa{du} \textipa{fo} fɔb pepar porlo}. \textit{*[intermediate scope]}
every student topic-on two CL all paper read
‘Every student read all the papers on the two topics.’

*Intermediate scope: \textit{[∀-student > topic two CL > ∀-papers]} (Dayal 2012)

Dayal uses the examples in (66) to demonstrate that [N Num Cl] must be characterized as
definites rather than specific indefinite as suggested in Bhattacharya (1999a), since the
latter should allow for an intermediate scope interpretation and would not require
maximality.

In contrast, the other word order [Num Cl N] does not require maximality (67a)
and can receive an intermediate scope interpretation (67b). The behavior of [Num Cl N]
shows that Num-ClPs with this order correspond to indefinites (Dayal 2010, 2011b, 2012).

(67) [Num-Cl-N]: indefinite
a. \textit{tine tf'atro eʃe tʃʰilo}. \textit{du \textipa{fo} tf'atro boʃlo}. \textit{*[maximality required]}
three CL student came two CL student sat
‘Three students came. Two (of the) students sat down.’
b. \textit{protek tf'atro du \textipa{fo} bifoy-e fɔb pepar porlo}. \textit{[intermediate scope]}
every student two CL topic-on all paper read
‘Every student read all the papers on the two topics.’
Intermediate scope: \textit{[∀-student > two-topics > ∀-papers]} (Dayal 2012)

Numeral \textit{one} in Bangla can occur in [Num Cl N] (68a) but not in [N Num Cl]
constructions (68b). In order to make (68b) grammatical, the numeral \textit{one} has to be
removed, leaving with the [N Cl] construction (68c).

(68) a. \textit{ek \textipa{ta} boi}
one CL book
‘one book’
b. *\textit{boi ek \textipa{ta}} \textsuperscript{11}
book one CL
Intended: ‘the book’
c. \textit{boi \textipa{ta}} \textit{[N Cl]: definite}
book CL
‘the book’
d. *\textit{ta boi} \textit{*[Cl N]}
CL book
(Dayal 2012)

\textsuperscript{11} The ungrammaticality in (55b) is analogous to the same phenomenon in English: \textit{*the one book}, and I refer the readers to Dayal (2012) for an explanation regarding why (55b) is unacceptable.
Note that, although Bangla allows numeral-less CIPs (68c), the noun has to precede the classifier, i.e. [N Cl], and the other word order [Cl N] is unacceptable (68d). Importantly, numeral-less classifier phrases [N Cl] can only receive a definite interpretation and can freely appear in argument position (Dayal 2010, 2011b, 2012; Jiang 2012). Two examples are given below.

(69)  
\[ \text{a. } \text{biral} \ _{\text{fa}} \ _{\text{amake}} \ _{\text{kamor}} \ _{\text{dilo}}. \]  
\[ \text{cat} \ _{\text{Cl}} \ _{\text{me-Acc}} \ _{\text{bite}} \ _{\text{have}} \]  
\[ \text{‘The cat has bitten me.’} \]  
\[ \text{b. } \text{O} \ _{\text{gari}} \ _{\text{fa}} \ _{\text{bikri}} \ _{\text{korlo}}. \]  
\[ \text{he} \ _{\text{car}} \ _{\text{Cl}} \ _{\text{sell}} \ _{\text{did}} \]  
\[ \text{‘He sold the car.’} \]

Regarding the structure of numeral containing phrases in Bangla, Bhattacharya (1999a, b) proposes that the basic word order is [Num Cl N] and that the alternative order [N Num Cl] is derived via raising of the noun phrase to the specifier position of a function projection (FP) above CIP where it checks for the specificity feature on the head of FP. Dayal (2010, 2011b, 2012) adopts Bhattacharya’s (1999a, b) analysis of the basic word order of numeral classifier phrases in Bangla (70a) as well as the NP-raising analysis (70b); however, having shown that the [N Num Cl] phrase expresses definite rather than specific indefinite (c.f. (66)), Dayal argues that NP raises to Spec DP in order to check definiteness, contrary to Bhattacharya’s claim that it raises to Spec FP to check specificity:

(70)  
\[ \text{Bangla numeral classifier phrases} \]  
\[ \text{a. basic order } [\text{Num Cl N}]_{\text{indefinite}} \]  
\[ \text{b. derived order } [\text{N Num Cl}]_{\text{definite}} \]

As we can see, although Bangla does not show any lexical evidence of determiners like Nuosu Yi or English, rearrangement of the canonical order within nominal phrases as means of conveying definiteness can also be considered evidence for the existence of the DP projection.\(^{12}\)

\(^{12}\) Regarding the analysis of the semantics of Bangla nominal arguments, I refer the readers to Dayal (2012, 2014), which also adopts the kind-denoting analysis of bare nouns in classifier languages and is compatible with the proposed analysis of numerals and classifiers.
Variation in classifier languages

The above facts and analysis of numeral classifier phrases in Bangla are similar to those in Nuosu Yi, as discussed in Chapter 4. Two examples from Nuosu Yi are repeated in (71), with the proposed analyses of them repeated in (72).

(71) Nuosu Yi numeral classifier phrases (with definite D)

a. cyx mu suo ma shep bo ox.
   3sg horse three Cl look-for go ASP
   'He/She went to look for three horses.'
   [N Num Cl: indefinite]

b. mu suo ma su nra jjy nra.
   horse three Cl the fat very fat
   'The three horses are very fat.'
   [N Num Cl su: definite]

(72) a. ClP: indefinite
   
   NP, si-hni 'girl'  
   NumP nyip 'two'
   Cl  ma

b. ClP  
   DP  
   D, su 'the'
   NP, tsrho 'man'
   NumP nyip 'two'
   Cl  ma

What the above comparison between Bangla and Nuosu Yi suggests is that structural visibility in Bangla has the same effect as lexical visibility in Nuosu Yi (the determiner su) and English (the determiner the) in terms of giving rise to a definite interpretation of numeral-containing phrases. Bangla, therefore, is the same as Nuosu Yi in being a [+D] classifier language. Crucially, even within the same type of classifier language which is [+D, +ARG unrestricted, -one-deletion], we can observe further variation in D, i.e. overt D [+D overt] versus covert D [+D covert], which are instantiated by lexical visibility or structural visibility.

Regarding the numeral-less classifier phrases in Bangla [N Cl] (55c), it has been argued to be the result of NP raising as well (73) (Dayal 2012, 2014):

(73) Bangla numeral-less CIPs [N Cl]: definite
   
   DP = definite
   NP, D'
   D, 0 
   Cl  ti
   261
Recall that numeral-less classifier phrases in Bangla only allows the [N Cl] order not the [Cl N] order; to account for this, Dayal (2012) assumes that the classifier needs to cliticize to an expression to its left and suggests that there is a null numeral \( \varepsilon k \) 'one' in these cases containing [Cl N] given their strictly singular interpretation. Since a null numeral does not allow cliticization, NP raising is always forced as a result.

Dayal's (2012) analysis is compatible with the analysis of Mandarin and Nuosu Yi, which treats Bangla as a classifier language that bans \( \text{one-} \)deletion at PF, resulting in the unacceptability of \( [\varepsilon \varepsilon k \text{ Cl N}] \):

(74) Bangla numeral-less CIPs [Cl N]: not allowed

\[
\begin{align*}
\text{Syntax} & \quad \text{b. one-deletion at PF disallowed} \\
\text{CIP} & \quad * [\varepsilon k \text{ Cl N}] \\
\text{NumP} & \quad \text{Cl} \quad \text{NP} \\
\varepsilon k f & \quad \text{to} \quad \text{boi} \\
\text{’one’} & \quad \text{’book} \\
\end{align*}
\]

One may wonder why Bangla does not allow a null indefinite D or a covert type-shifting operation to turn the classifier phrase into an argument:

(75) Two possible operations to shift Bangla bare CIPs to argument

\[
\begin{align*}
\text{a. shift via null D to indefinites} & \quad \text{b. shift via type-shifting to indefinite} \\
\text{DP} & \quad \exists [\text{CIP Cl NP}] \\
\text{D_{indef}} & \quad \emptyset \quad \text{CIP} \\
\emptyset & \quad \text{Cl} \quad \text{NP} \\
\end{align*}
\]

In addition to explaining why the above two options are not available in Bangla with Dayal's (2012) assumption that the classifier needs to cliticize to an expression to its left in this language, we perhaps can also turn to the general fact that that languages having definite lexical determiners need not necessarily also have indefinite ones, e.g. Attic Greek or Hebrew (Chierchia 1998b: 362). Bangla could be assumed to lack indefinite D in its grammar in the same way languages with definite determiners lack indefinite D. In other words, Bangla can be viewed as the same as Nuosu Yi in lacking an indefinite D.

In this section, we saw that although Nuosu Yi is typologically rare, it is not the only classifier language that exhibit overt evidence for D; another classifier language, i.e., Bangla, also shows overt evidence for D, via rearrangement of the canonical order within nominal phrases as means of conveying definiteness. In addition, Bangla bare nouns and numeral-(less) classifier phrases behave similarly to those in Nuosu Yi. Under the proposed analysis of Mandarin and Nuosu Yi (c.f. Section 5.2), Bangla is the same as Nuosu Yi in being a \([\text{+D, +ARG}_{\text{unrestricted}}, \text{–one-deletion}]\) classifier language. The updated
Variation in classifier languages

variation of argument formation in classifier languages captured with the three parameters \([\pm D, \pm \text{ARG}, \pm \text{one-deletion}]\) is given below.

(76) Classifier languages attested with \([\pm D, \pm \text{ARG}, \pm \text{one-deletion}]\) parameters

<table>
<thead>
<tr>
<th>Classifier language</th>
<th>D</th>
<th>ARG\text{unrestricted}</th>
<th>one-deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Mandarin</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>(ii) Cantonese</td>
<td>-</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(iii) Southern Min, Japanese, Korean</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(iv) Bisu</td>
<td>-</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>(v) Nuosu Yi, Bangla</td>
<td>+</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>(vi) Thai</td>
<td>+</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>(vii) Vietnamese</td>
<td>+</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>(viii) ?</td>
<td>+</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

Note that, similar to Cantonese (Section 5.3.1.1) and Vietnamese (Section 5.3.2.2), whether or not Bangla allows its bare nouns to receive a definite interpretation is controversial. It has been reported that Bangla bare nouns do not receive a definite interpretation (Dayal 2011b), but it has also been reported that there are some contexts where Bangla bare nouns can receive a definite reading (Simpson et al 2011; Dayal 2012).

It seems that although bare nouns across classifier languages behave very similarly in terms of distribution and interpretations (i.e. generic, existential, kinds), there is certain variation in expressing definiteness via bare nouns. I will now turn to the definite reading, a phenomenon that calls for a more fundamental shift in the picture of cross-linguistic variation in the domain of noun phrase semantics.

5.4 Variation in marking definiteness in classifier languages

We have seen that most classifier languages, from the familiar ones such as Mandarin and Japanese to the typologically rare ones like Nuosu Yi, can simply use bare nouns for definite reference. In addition, we saw that Nuosu Yi also has a genuine definite determiner *su* for definite reference. Although classifier languages with real definite determiners are rare, there are several classifier languages, such as Cantonese, Bisu, Vietnamese, Bangla, where definiteness is somewhat overtly marked via more complex structures (c.f. Section 5.3). For example, Cantonese employs bare classifier patterns \([\text{Cl NP}]\) as the canonical way to convey definite interpretation (Cheng and Sybesma 1999, 2005; Cheng et al 2012, c.f. Section 5.3.1.1); Vietnamese also employs bare classifier patterns \([\text{Cl NP}]\) to convey definite interpretation (Bisang 1999; Nguyen 2004; Simpson et al 2011; Trinh 2011, c.f. Section 5.3.2.2); Bangla uses bare classifier phrases with inverted word order to do so (Bhattacharya 1999a, b; Dayal 2010, 2011b, 2012. c.f. Section 5.3.2.4):

(77) \texttt{bzek gau zungji sek juk.} (Cantonese)

Cl dog like eat meat
Variation in classifier languages

‘The dog likes to eat meat.’ (not: dogs like eating meat) (Cheng and Sybesma 1999)

(78) Mang cuÓn sách ra  Çaý. (Vietnamese)
    Bring CL book out here
    ‘Go get a/the book.’ (Nguyen 2004: 34)

(79) a. *ta boi
    Cl book
b. boi ta
    book Cl
    ‘the book’ (Dayal 2012)

Interestingly, in these three languages, it has been claimed that their bare nouns generally do not receive definite interpretations (see Cheng and Sybesma (1999, 2005) for Cantonese; Trinh (2011) for Vietnamese; Dayal (2011b) for Bangla, c.f. Section 5.3). An example from Cantonese and one from Vietnamese are given below.

(80) *(zek) gau soeng gwo maalou. (Cantonese)
    Cl dog want cross road
    ‘The dog wants to cross the road.’ (Cheng and Sybesma 1999)

(81) Cho thich an thit
    dog like eat meat
    ‘Dogs / *The dog(s) like(s) to eat meat’ (Trinh 2011)

The range of options for marking definiteness in classifier languages has be summarized in Dayal (2012) as follows:

<table>
<thead>
<tr>
<th>Kind</th>
<th>Definite</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mandarin</td>
<td>NP</td>
</tr>
<tr>
<td>Cantonese</td>
<td>NP [Cl [NP]]</td>
</tr>
<tr>
<td>Bangla</td>
<td>NP [DP NP, [Cl [t_i]]]</td>
</tr>
<tr>
<td>Nuosu Yi</td>
<td>NP [DP D_def [Cl [NP]]] or NP (Dayal 2012)</td>
</tr>
</tbody>
</table>

We see that the presence of overt lexical Ds (e.g. in Nuosu Yi) does not block the definite reading of bare nouns, whereas definiteness marking via complex syntactic structures (e.g. in Cantonese and Bangla) seems to exclude the definite use of bare nouns. Both facts call into question a simple version of the Blocking Principle (Chierchia 1998b, (6b)) as regulating the possibility of definite interpretations for bare nominals across languages. I repeat the Blocking Principle below.

(83) Blocking Principle (‘Type Shifting as Last Resort’) (Chierchia 1998b)
    For any type shifting operation τ and any X: *τ(X), if there is a determiner D such that for any set X in its domain, D(X) = τ(X)

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In the following I lay out a new perspective, due to Gennaro Chierchia (personal communication), for addressing the range of cross-linguistic variation that has been observed in this domain.

To set the stage for this new approach, recall the two ways in which bare nominals in languages without articles have been argued to attain definite readings (c.f. Chapter 2, Section 2.5.3). One is through the covert application of \textit{iota} to a property denoting bare noun. This may be done directly in languages where NPs can be properties, languages that were classified as [+pred] in Chierchia (1998b). Hindi has been argued by Dayal (2004) to be such a language. The issue is more pressing for languages like Mandarin that are classified as [-pred]. Yang (2001), for example, suggests the derivation in (84b). An alternative account, due to Trinh (2011), Dayal (2011a, 2012), and Jiang (2012, 2014, 2018), derives this interpretation directly by taking the extension of the kind at the relevant index, which I refer as \textit{Situation Restriction} (SR) in short (c.f. Chapter 2, Section 2.5.3), as shown in (84c).

\begin{enumerate}
  \item \textbf{gou} \textbf{zai} \textbf{jiao}. (Mandarin)
  \begin{itemize}
    \item dog \textbf{Prog} bark
    \end{itemize}
  \item \textit{barking(\text{\text{\text{-\text{dogs}}}})} = \textit{barking(\text{\text{\text{iota(\text{\text{-\text{dogs}}(x)})}}})}
  \item \textit{barking(\text{\text{\text{-\text{dogs}}}})} = (\text{via Situation Restriction}) \Rightarrow \textit{barking(\text{\text{\text{-\text{dogs}}(s)})}}
\end{enumerate}

We are now in a position to draw some crucial distinctions that can help explain the paradigm we are interested in. The three canonical covert type-shifting operations in the semantics, $\cap$, $\iota$ and $\exists$, apply to properties (e.g. see (5b') in Section 5.2). That is, they are of type $<<e,t>, e>$ or of type $<<e, t>, <<e,t>,t>>$:

\begin{enumerate}
  \item Nominalize: $\cap P = \lambda s \iota P_s$, if $\lambda s \iota P_s$ is in $K$, else undefined.
  \item Iota: $\iota X = \text{the largest member of } X \text{ if there is one, else, undefined.}$
  \item Existential closure: $\exists X = \lambda P \exists y[ X(y) \land P(y)]$
\end{enumerate}

The type-shifter involved in the Situation Restriction strategy, on the other hand, applies to kinds and is of type $<e^k, e>$. The \textit{Blocking Principle} as formulated in (83) only governs the blocking of the canonical type-shifters and is not applicable to Situation Restriction. So what I am going to develop is a blocking principle that can apply to Situation Restriction, which draws on Chierchia (2016).

Chierchia uses \textit{arg} for the covert type-shifting strategy Situation Restriction in (84c) and \textit{ARG} for any of the three covert canonical argumentizing type-shifting operations in (83). He hypothesizes a 'Generalized Blocking Principle' that governs the application of "arg" and "ARG" along the following lines:

\begin{enumerate}
  \item Generalized Blocking Principle
  \begin{itemize}
    \item For arg and any ARG
      \begin{itemize}
        \item $\arg (||NP||)$ if there is an XP that minimally contains NP and ARG ($||XP||) = \arg (||NP||)$
      \end{itemize}
  \end{itemize}
\end{enumerate}
The above Generalized Blocking Principle (GBP in short) states that the covert operation "arg" on bare NPs will be blocked if there exists a covert operation "ARG" that can turn an XP that minimally contains NP into an argument with the same interpretation (i.e. definites).

"Minimally contain" can be defined at the basis of Grimshaw's (1991) notion of Extended Projection, which consists of a lexical category and extended functional categories. In our case, the functional head X (i.e. Cl) and its phrasal projection XP (i.e. CIP) are the extended projections of the lexical category N(noun) (87), and XP minimally contains NP iff the enumeration of NP is a subset of that of XP.

(87) \[ \begin{array}{l}
\text{XP} \quad \text{X} \quad \text{NP} \quad \text{N} \end{array} \]

Crucially, what Generalized Blocking Principle suggests is the idea of not doing covertly what one can do with dedicated syntactic structure.

Let me illustrate how the Generalized Blocking Principle accounts for the variation on definiteness marking in classifier languages that we saw at the beginning of this section. Nuosu Yi would escape the Generalized Blocking Principle, because ARG never comes into play in forming definites, i.e. \( \tau \) is not used as a covert type-shifting operation in Nuosu Yi; instead it is lexicalized as an overt definite determiner \( su \):

(88) a. \( \text{si-hni} \quad \text{ma} \quad \text{sini} \quad \text{sse-vo} \quad \text{ma} \quad \text{i-go} \quad \text{nyi}, \quad \text{si-hni} \quad \text{ma} \quad \text{su} \quad \text{jijy} \quad \text{nra}. \) (Nuosu Yi)
   ‘A girl and a boy are sitting in the room; the girl is very pretty.’

b. \( su ([\text{CIP} \quad \text{NP} \quad \text{si-hni}] \quad \text{ma}]) = \exists x [\text{AT} (\bigcup \text{girls})(x) \land \text{having a meal}(x)] \)

ARG, however, does come into play in forming indefinites in Nuosu Yi. Consider the bare classifier pattern in (89a) and its classifier-less counterpart in (89c):

(89) a. \( \text{si-hni} \quad \text{ma} \quad \text{dza} \quad \text{dzu} \quad \text{njuo}. \) (Nuosu Yi)
   ‘A girl is having a meal.’

b. ARG ([\text{CIP} \quad \text{NP} \quad \text{si-hni} \quad \text{ma}]) = \exists x [\text{AT} (\bigcup \text{girls})(x) \land \text{having a meal}(x)]

c. \( \text{si-hni} \quad \text{dza} \quad \text{dzu} \quad \text{njuo}. \) (Nuosu Yi)
   ‘The girl is having a meal.’

   arg ([\text{NP} \quad \text{si-hni}]) = \bigcap \text{girls}(s)

d. ARG ([\text{CIP} \quad \text{NP} \quad \text{si-hni} \quad \text{ma}]) \neq \text{arg} ([\text{NP} \quad \text{si-hni}]) \qquad \text{(GBP inapplicable)}

The bare classifier phrase in (89a) [\text{CIP} \quad \text{NP} \quad \text{si-hni} \quad \text{ma}] and the bare noun in (89c) [\text{NP} \quad \text{si-hni}] fit the structural description of Generalized Blocking Principle in (83). However, [\text{CIP} \quad \text{NP} \quad \text{si-hni} \quad \text{ma}] can only be turned into an argument with an indefinite interpretation by ARG (89b) due to the Ranking of Meanings in (6a) (as repeated in (90)) and the Blocking Principle in (83). Specifically, the overt definite determiner \( su \) blocks \( \tau \) from turning [\text{CIP} \quad \text{NP} \quad \text{si-hni} \quad \text{ma}].\)
Variation in classifier languages

[NP si-hni] ma] into a definite, and turning it into a kind is undefined because the singularity of the bare classifier phrase clashes with the conceptual notion of a kind (Dayal 1992; Chierchia 1998b, c.f. Chapter 4, Section 4.8.5). As a consequence, the bare classifier phrase and the bare noun in Nuosu Yi wind up having different interpretations, as shown in (89d). This explains why (89a) and (89c) are both allowed.

(90) Ranking of Meaning: \{\cap, \mid\} > \exists \quad \text{(Chierchia 1998b, revised in Dayal 2004)}

In Cantonese/Vietnamese/Bangla, because there is no overt definite determiner like su, Ranking of Meanings (90) and the Blocking Principle in (83) predict that the bare classifier phrase ARG ([ClP Cl [NP N]]) comes out as definite:

(91) Deriving the interpretation of bare ClPs in Cantonese/Bangla

a. ARG ([ClP Cl [NP N]]) = \{x \in (AT(\cap k))(x)| not blocked by any overt definite D
b. \cap x [(AT(\cap k))(x)] is undefined for singular properties
c. \exists x [(AT(\cap k))(x)] is ruled out by Ranking of Meaning in (18aii)

Given that ARG ([ClP Cl [NP N]]) = arg (NP) in Cantonese/Bangla, Generalized Blocking Principle in (86) kicks in, and arg (NP) is blocked by the availability of (91a). This captures the generalization that the bare classifier pattern is the default way to convey definiteness and that bare nouns are not used for definite reference in Cantonese/Vietnamese/Bangla.

Lastly, in languages like Mandarin which do not employ ARG to argumentize bare ClPs [Cl NP] (c.f. Section 5.2), Generalized Blocking Principle is simply not applicable.

Although the analysis sketched above is appealing, the fact that there are some contexts where Cantonese/Vietnamese/Bangla bare nouns do receive definite readings presenting a potential counterexample (Bisang 1999; Nguyen 2004; Wu and Bodomo 2009; Simpson et al 2011; Dayal 2012, c.f. Section 5.3).\footnote{See Simpson et al (2011) for further discussion. In particular, they use five primary sub-types of situations licensing the use of definite determiners in English, French etc. to probe the occurrence of the bare classifier pattern and bare nouns in definite contexts in four classifier languages, including Cantonese, Vietnamese and Bangla.}

I repeat two examples from Cantonese, which show that both bare nouns and bare classifier phrases are acceptable for definite reference.

(92) a. Context: Mary says to John: "Take a photograph of me.'  
John gong2: m4 dak1. (Go3) soeng2-gei1 waai6 zo2.  
John say not can Cl camera broken asp  
‘John says: I can’t. The camera’s broken.’

b. Cam4 jat6 ngo5-dei6 heoi3 jat1 go3 fan1-lai5. (Go3) san1-loeng4 hou2 leng3.  
yesterday we go one Cl wedding Cl bride very pretty  
‘Yesterday we went to a wedding. The bride was beautiful.’

(Simpson et al 2011)
Although I cannot provide a definitive explanation for such cases at this time, a possible solution is to make *Generalized Blocking Principle* (86) a weak constraint. To be concrete, *Generalized Blocking Principle* would not evaluate structures of same kinds, and to place structures of different kinds in a competition lacks legitimacy and requires motivation, thus leaving some room for exceptions.

I also note in this context that something similar has been noted for English as well. The following, from Condoravdi (1997: 69), shows some similarities with the paradigm in (93).

(93) In 1985 there was a ghost haunting the campus. *Students/The students* were aware of this fact/the danger.

The referential ability of the bare plurals in (93) seems to suggest that bare plurals in English behave like definite plurals and also seems to suggest the operation of *iota* (c.f. Dayal 2013). Nevertheless, as argued in Dayal (2013), we cannot equate bare plurals in English in (93) with definite plurals. One of her arguments is that bare plurals in English do not admit anaphoric definite readings:

(94) Some children came in. *Children* sat down.

Crucially, bare nouns in Cantonese as well as those in Vietnamese and Bangla exhibit a common pattern with regard to discourse-anaphoric definite reference, i.e. their speakers show a preference for bare ClPs over bare nouns (see Simpson et al 2011: 178-182). One question that we may ask is whether bare nouns in these languages (c.f. (22c), (55b, c), (62d)) should be treated as definites or bare plurals in English. If the former is pursued, we can treat *Generalized Blocking Principle* as a weak constraint; if the latter is chosen, there is no need to treat *Generalized Blocking Principle* as a weak constraint, and these examples perhaps can be explained by the account developed in Dayal (2013). I do not have arguments in favor of one or against the other at this time and therefore leave this question open for future research.

Before ending this discussion, one issues are worth noting, namely why English bare nouns cannot tap into the Situation Restriction operation in (84c) to derive definite readings of its kind denoting bare plurals:

(95) a. Dogs are barking.
   b. (51a) = *barking(s)(dogs) (via Situation Restriction) => barking((dogs)(s))

I would suggest that the derivation in (95b) is ruled out for reasons of economy. In English, the overt definite determiner *the* can apply to the property-denoting nouns directly, yielding definite readings. In the derivation in (51b), two operations are involved, the application of the down-operator which derives kinds from properties and the application of the EI strategy which derives definites from kinds. When a one-step, direct derivation is available, two-step derivations of the kind seen in (51b) can be viewed as a departure from computational efficiency, a third factor principle (a term due to Chomsky (2005)) not specific to but also applicable to the human language faculty (Chomsky 2005, 2007, 2008). In other words, I suggest that Situation Restriction is universally available
Variation in classifier languages

and that it is some independent yet general principle that prevents it from applying to bare nouns in some languages (i.e. languages that are not [+arg, –pred]).

In (96), I summarize the different ways to express definiteness, indefiniteness, and kinds in classifier languages that we examined so far (e.g. via bare nouns, numeral-less classifier phrases, numeral classifier phrases, overt definite articles, or word order).

(96) Summary of ways to express (in)definites and kinds in classifier languages

<table>
<thead>
<tr>
<th></th>
<th>SVO</th>
<th>SOV</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mandarin</td>
<td>Cantonese</td>
</tr>
<tr>
<td>definite</td>
<td>bare Ns</td>
<td>(?bare Ns bare CIPs</td>
</tr>
<tr>
<td>indefinite</td>
<td>Num-CIPs bare CIPs (restricted)</td>
<td>Num-CIPs bare CIPs (restricted)</td>
</tr>
<tr>
<td>kind</td>
<td>bare Ns</td>
<td>bare Ns</td>
</tr>
</tbody>
</table>

Note: I use the question mark '?' in (96) to mark the cases that are controversial in the literature.

5.5 Summary of discussion on classifier languages

One of the overarching goals of this book has been to provide a uniform account of bare nominal arguments (i.e. bare numeral classifier phrases, bare classifier phrases, bare nouns) in classifier languages in general. A key view that I argued for is that bare nouns in classifier languages universally denote kinds (i.e. entities) (c.f. Section 2.4.2 and Section 4.8.6). The analyses of Mandarin and Nuosu Yi capture both the universal properties and the variable properties of classifier languages (c.f. Section 5.2). Among the universal properties, we encountered the following: (i) the uniform behavior of bare numeral classifier phrases (e.g. predicative; indefinite, with the long-distance scope ability); (ii) bare nouns uniformly denote kinds and appear freely in argument positions; and (iii) numerals cannot combine with a noun directly without a classifier:

(97) Universal properties in classifier languages
     (i) bare numeral classifier phrases are predicative and indefinite, with a peculiar scope behavior.
     (ii) bare nouns uniformly denote kinds and appear freely in argument position
     (iii) numerals cannot combine with a noun directly without a classifier

The variable properties of classifier languages regarding bare nominal arguments mainly lie in (i) whether or not they have the function category D in their grammar, (ii) whether or not they freely allow numeral-less classifier phrases to appear in argument positions
(as a result of applying covert argument forming operations ARG unrestrictedly), and (iii) whether or not they allow one-deletion in the PF.

Variable properties in classifier languages
(i) whether or not they have the function category D in their grammar
(ii) whether or not they freely allow numeral-less classifier phrases to appear in argument positions
(iii) whether or not they allow one-deletion in the PF.

These three parameters \([\pm D, \pm \text{ARG unrestricted}, \pm \text{one-deletion}]\), as we saw, predict eight types of classifier languages, most of which are indeed attested (c.f. Section 5.3):

Variation and typology of nominal argument formation (preliminary version)

\[ \begin{align*}
[+\text{ARG unrestricted}] & \quad \text{[+one-deletion]: Cantonese} \\
[-D] & \quad \text{[−one-deletion]: Bisu} \\
[-\text{ARG unrestricted}] & \quad \text{[+one-deletion]: Mandarin} \\
[−one-deletion]: Southern Min & \quad \text{Japanese} \\
& \quad \text{Korean} \\
[+\text{one-deletion}]: Vietnamese & \\
[+\text{ARG unrestricted}] & \quad \text{[−one-deletion]: Nuosu Yi, Bangla} \\
[+\text{one-deletion}]: ? & \\
[−\text{ARG unrestricted}] & \quad \text{[−one-deletion]: Thai} \\
\end{align*} \]

In addition to the variation in (99), we also examined the variation in expressing definiteness via bare nouns in classifier languages. Specifically, some classifier languages which freely employ numeral-less CIPs to express definiteness tend not to use bare nouns for definiteness (e.g., Cantonese, Bangla), a phenomenon which was accounted for via the Generalized Blocking Principle (c.f. Section 5.4).

In (100), I summarize the universal properties and variable properties of bare nominal arguments in each classifier language discussed in Chapter 5.
(100) Summary of universal properties and variable properties of bare nominal arguments in classifier languages

<table>
<thead>
<tr>
<th>Classifier languages</th>
<th>Universal properties</th>
<th>Variable properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Bare Ns denote kinds</td>
<td>(ii) Choice function in bare numerals</td>
<td>(iii) [±ARG_{\text{universal}}]</td>
</tr>
<tr>
<td></td>
<td>visible</td>
<td>visible</td>
</tr>
<tr>
<td>Mandarin</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Cantonese</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Southern Min/ Japanese/Korean</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Bisu</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Nuosu Yi</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Bangla</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Thai</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Vietnamese</td>
<td>√</td>
<td>√</td>
</tr>
</tbody>
</table>

Note: the question mark ‘?’ marks the controversial cases in the literature, as discussed in Section 5.4.

Explanations of the chart in (100) are given below.

(101) **BARE NOUNS DENOTE KINDS = (100i)**
Bare nouns in classifier languages uniformly refer to kinds (i.e. entities). As entity-denoting, bare nouns can combine directly with a verb but cannot combine directly with a numeral. As entity-denoting, bare nouns in classifier languages also cannot combine with D due to type mismatch. Empirical evidence was provided from Nuosu Yi which shows that the definite determiner *su* cannot combine with bare nouns, but only with property-denoting bare CIPs or numeral CIPs (c.f. Chapter 2 and Chapter 4).

(102) **CHOICE FUNCTION IN BARE NUMERALS = (100ii)**
Bare numeral containing phrases can be predicative and argumental with an indefinite reading and a peculiar scope behavior across languages regardless of whether a language is a classifier language or a number marking one and regardless of whether a language has D or not. Such uniform behaviors of bare numeral indefinites across languages, as argued in Chapter 2, are the result of the

---

14 There seems to be an indefinite gap of a visible indefinite determiner in classifier languages, and we have no explanation for it. However, our theory does predict that a classifier language with a visible indefinite determiner should exist, and the reason why we haven’t attested a language like this yet could be due to the fact that these languages (i.e. classifier languages) are under-studied.
universal choice function variable in the lexical entry of bare numerals. The choice function variable can turn numeral-containing phrases to indefinites, enabling the long-distance scope interpretation and accounting for their uniform behavior across languages.

(103) \([\pm\text{ARG}_{\text{UNRESTRICTED}}] = (100\text{iii})\)
Some classifier languages freely allow numeral-less classifier phrases (i.e. a phrase consisting of a classifier and a noun) to appear in argument positions. This variable property is accounted for if we assume that some languages can apply semantic type-shifting unrestrictedly to turn numeral-less ClPs into arguments (c.f. Chapter 5, Section 5.2).

(104) \([\pm D] = (100\text{iv})\)
Some classifier languages have visible evidence of D, i.e., (i) a visible definite article (e.g., Nuosu Yi), or (ii) rearrangement of word order that gives rise to different meanings (e.g., Bangla). Some classifier languages have null Ds which can turn bare numeral classifier phrases into arguments with a definite interpretation (e.g., Vietnamese). Some classifier languages simply have no D in their grammar. In other words, whether a language has the functional category D is subject to parameterization.

(105) \([\pm\text{ONE-DELETION}] = (100\text{v})\)
Some classifier languages allow numeral one to be omitted from [one Cl N] (e.g., Mandarin). Such a phenomenon is argued to be PF-related in Chapter 2. The PF one-deletion rule is a variable property of classifier languages and is not available in all classifier languages.

(106) \(\text{GENERALIZED BLOCKING PRINCIPLE} = (100\text{vi})\)
Some classifier languages which freely employ numeral-less ClPs to express definiteness tend not to use bare noun for definiteness (e.g., Cantonese, Bangla). This phenomenon is accounted for via the Generalized Blocking Principle (GBP), which states that the covert operation "arg" on bare nouns, which derive definites from kinds, will be blocked if there exists a covert operation "ARG" that can turn an XP that minimally contains a bare N into an argument with the same definite interpretation (Chapter 5, Section 5.4).

In the next chapter, I discuss the relationship between nominal argument formation in classifier languages and nominal argument formation more generally. I will show how the analysis of classifier languages developed in previous chapters integrates the more well-studied number marking languages (e.g. English, French, Italian, and Hindi) and the less-discussed languages which have neither a general classifier system (unlike Mandarin or Nuosu Yi) nor obligatory singular/plural marking on nouns (unlike English or Hindi).
Chapter 6

Implications on nominal argument formation in general
— Language universals, variation and typology of nominal arguments

6.1 Introduction

The previous chapters provided analyses for two kinds of classifier languages: those that show evidence of a DP projection and those that do not. Nuosu Yi was the language used as the representative for the group of classifier languages that show evidence of D, while Mandarin was the representative language for the classifier languages that do not have a DP. The proposed analysis of classifier languages rested crucially on the assumption that bare nouns in classifier languages denote kinds (i.e. entities), as argued in Chapter 2 and Chapter 4. We also noted a parallel between classifier languages and number marking languages, that is, languages with obligatory morphological exponents of grammatical number. Number marking languages like Hindi and Russian can be seen as the non-classifier versions of classifier languages without D since these also lack any visible evidence of D. On the other hand, number marking languages, such as the Romance and Germanic languages, can be seen as the non-classifier versions of classifier languages with D. This parallel will prove crucial to our discussion in the first part of this chapter.

The goal of Chapter 6 is to examine how the proposed analysis of classifier languages developed in the previous chapters fits into the general discussion of nominal argument formation and language variation. I will achieve that in two ways. The first way is to show how the analysis of classifier languages integrates the more well-studied number marking languages. The second is to show how our analysis accommodates those languages which have neither a general classifier system (unlike Mandarin or Nuosu Yi) nor obligatory singular/plural marking on nouns (unlike English or Hindi).

This chapter is organized as follows. Section 6.2 revisits number marking languages and focuses on two issues: (i) how number languages vary regarding nominal argument formation., and (ii) whether the proposed analysis of classifier languages can capture variation and uniform properties in number marking languages. It will be shown that the two main parameters in the nominal domain [±D] and [±ARG\textsubscript{unrestricted}], which capture variation in classifier languages (c.f. Chapter 5), also capture variation in number marking languages. Section 6.3 discusses two languages, Yudja and Lhasa Tibetan, both of which have neither obligatory classifiers nor obligatory number marking on nouns nor article determiners. We will see a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages in the nominal domain. I will show that the proposed uniform D-less analysis of bare numeral containing phrases (c.f. Chapter 2) can also accommodate these two types of languages if we allow the
overtness at PF of the functional head in the bare numeral containing phrases (Div/Cl) to be subject to variation. Section 6.4 summarizes.

6.2 Number marking languages: to D or not to D?

The main goal of this section is to show that our analysis of nominal arguments in classifier languages can fit into these more well-established number marking languages. I focus on two issues: (i) what kinds of variation and universals concerning bare nominal arguments do number marking languages exhibit? (ii) How can we account for these variable properties and uniform properties in a way compatible with the proposed analysis of nominal arguments in classifier languages? Number marking languages to be discussed in this section include English and German (two Germanic languages), Italian and French (two Romance languages), Hindi (an Indo-Aryan language), and Russian (a Slavic language).

6.2.1 Bare nominal arguments in number marking languages: variation and universals

This section addresses variation and universal properties concerning nominal arguments in number marking languages. I will start with variation and move on to the common properties that these languages share.

At least two dimensions of variation should be considered. The first one concerns the semantic interpretation and the syntactic distribution of bare nominal arguments. The second dimension of variation which is closely related to the first one is about whether or not bare nouns can serve freely as arguments. These two dimensions of variation will be illustrated below.

In number marking languages, definites and indefinites can be marked through an overt determiner, such as Romance and Germanic languages (1), or through bare nouns if no overt determiners are attested, like Hindi and Russian (4).23

(1)  a. A dog is barking.    (English)
     b. The dogs are barking.

---

1 As noted in fn. 1 in Chapter 2, ‘number marking languages’ in this work refers to standard number marking languages such as Romance and Germanic languages where number morphology is obligatory when a numeral (except for ‘one’) combines with any count noun. Number marking languages in this book do not include languages like Turkish, Hungarian or Western Armenian, which have number morphology on bare nouns without the occurrence of numerals but ban number morphology or optionally allow it on nouns when they appear with a numeral. These languages will be referred to as non-canonical number marking languages. I leave these non-canonical number marking languages for future research and refer the readers to fn. 1 in Chapter 2 for references on different accounts for the variation between number marking languages and non-canonical number marking languages.

2 Note that in English, bare plurals can receive an narrow scope existential reading; however, this reading differs from indefinite, which allows both long distance scope as well as narrow scope interpretations (e.g. see Carlson 1977a, b, c.f. Chapter 2).

3 As we saw in Chapter 2, bare numeral-noun phrases (e.g., two boys) can express indefiniteness as well; I will go back to this common properties across languages after I introduce the two dimensions of variation in number marking languages.
Implications on nominal argument formation in general

(2)  
a. *kamre mEN cuuhag hai. (Hindi)  
room in mouse is  
‘There’s a mouse in the room.’
b. *kutte bahut bhau Nkte haiN.  
dogs lot bark  
‘The dogs/Dogs bark a lot.’ (Dayal 2004: 402, 404)

As for the kind interpretation, it can be expressed in at least four ways in number marking languages: through bare plurals (i.e. determinerless plurals) and definite singular but not definite plurals, such as English (3), or through definite plurals or definite singular but not bare plurals, such as French and Italian (4)/(5), or through bare plurals and definite singulars as well as definite plurals, such as some German dialects, (6), or simply through bare nouns if no overt determiners are attested, like Hindi and Russian (7) (e.g. see Carlson 1977a, b; Vergnaud and Zubizarreta 1992; Krifka et al 1995; Chierchia 1998a, 2016; Dayal 2004).

(3)  
a. (*The) Dinosaurs are extinct. (English)  
b. The dinosaur is extinct.

(4)  
a. *(Les) pandas sont éteint. (French)  
the panda are extinct  
‘The panda is extinct.’  
b. Le panda est éteint.  
the panda is extinct  
‘The panda is extinct.’ (Krifka et al 1995: 68)

(5)  
a. *(I) dinosauri sono estinti. (Italian)  
the dinosaurs are extinct  
‘Dinosaurs are extinct.’  
b. Il dinosauro è estinto.  
the dinosaur is extinct  
‘The dinosaur is extinct.’ (Longobardi 1994: 615)

(6)  
a. *(Die) Pandabären sind vom Aussterben bedroht. (German)  
the pandas are of extinction threatened  
‘Pandas are facing extinction.’ (Krifka et al 1995: 68)  
b. Der Pandabär ist vom Aussterben bedroht.  
the panda is of extinction threatened  
‘The Panda is facing extinction.’ (Dayal 2004: 441, 442)

(7)  
a. kutte yehaaN aam haiN. (Hindi)  
dogs here common are  
‘Dogs are common here.’  
b. kutta aam janvar hai.  
dog common animal is
Implications on nominal argument formation in general

‘The dog is a common animal.’ (Dayal 2004: 402)

In addition to expressing (in)definiteness and kind in a different way, number marking languages also vary in a great deal regarding the syntactic distribution of bare nominals (include bare singulars, bare plurals and bare mass nouns). As is well known, determiner-less singulars are completely banned in argument position in both Romance and Germanic languages (8), but bare plurals and mass nouns exhibit great variation across these languages (e.g. see Carlson 1977b; Vergnaud and Zubizarreta 1992; Longobardi 1994; Krifka et al 1995; Chierchia 1998b; Dayal 2004, among others). For instance, bare plurals and mass nouns are freely permitted to serve as arguments in some Germanic languages, like German and English (9) but are allowed in restricted positions (e.g., ‘lexically governed’ positions and certain positions in the left periphery, like contrastive topic) with a restricted interpretation (e.g., a narrow scope existential reading) in some Romance languages, such as Italian (10); in some other Romance languages, like French, bare plurals and mass nouns are simply banned (11).

(8)  
a. *(La) baleine est réputée être le plus grand mammifère / joue. (French)  
the whale is deemed be the most grand mammal / play  
‘The whale is regarded as the biggest mammal/ is playing’  
b. *(Il) cane ama giocare / sta giocando fuori /è raro. (Italian)  
the dog loves play is playing outside is rare  
‘The Dog loves to play/is playing outside/is rare’  
c. *(The) panda is facing extinction / is playing outside. (English)  
(Chierchia 1998b: 341, with slight modification)

(9)  
a. Whales are becoming extinct. (English)  
b. I saw/like dogs.

(10)  
a. *Acqua viene giu dalle colline  
water comes down from the hills  
b. Ho preso acqua dalla sorgente.  
I took water from the spring  
‘I took water from the spring.’ [narrow scope existential]  
c. *Ho amo buon vino e frutti freschi.  
I love good wine and fresh fruit  
Intended: ‘I love good wine and fresh oranges.’ *[generic]  
(Longobardi 1994: 616, 631)  
d. POLLO io voglio, non pesce.  
CHICKEN I want, not fish  
‘I want CHICKEN not fish.’  
(Chierchia 1998b: 384)

(11)  
a. *(Les) baleines sont en train de disparaitre.  
the whales are in process of disappear  
i. ‘Whales are becoming extinct.’  
ii. ‘the set of sub-species of whales is becoming extinct.’  
(Vergnaud and Zubizarreta 1992: 635)
Implications on nominal argument formation in general

b.*J’ai mangé biscuits dans mon lait.
‘I ate cookies with my milk.’ (Chierchia 1998: 355)

Unlike Romance and Germanic languages, Russian, Hindi and most Slavic languages (number marking languages without overt determiners) freely allow bare nominals (bare singulars, bare plurals, and mass nouns) to occur in argument position (e.g. see Chierchia 1998b, Progovac 1998; Dayal 2004; Bošković 2005, among others). We have seen bare singulars and bare plurals from Hindi in (2) and (7); more examples from Russian are given in (12).

(12) a. V komnate byli mal’chik i devocka. (Russian)
    in room were boy and girl
    ‘A boy and a girl were in the room.’
b. Ljudi proizoshli ot obez’jan.
    Men evolved from apes
    ‘Men have evolved from apes.’ (Dayal 2004: 402, 404)

As we can see, number marking languages vary widely regarding the distribution and interpretation of bare nouns and the way how bare nouns form arguments (e.g. obligatorily via an overt D, optionally via an overt D, or not through an overt D). Nevertheless, the behaviors of their bare numeral-noun phrases remain cross-linguistically constant and differ significantly from those of bare nouns (c.f. Section 2.2, Chapter 2). Specially, we saw in Chapter 2 the following behaviors of bare numeral-noun phrases across languages:

(13) Basic generalization from number marking languages:
    i. Numeral-noun phrases are always both predicative and argumental.
    ii. In their argumental role, numeral-noun phrases are always indefinites (with peculiar scope and island escaping behaviors).
    iii. They can combine with a definite element/marker and then (and only then) they become definite.
    iv. This is so regardless of whether or not a language has (overt) Ds.

I repeat examples from English, French and Russian below.

(14) English bare numeral-noun phrases
    a. predicative
        John and Bill are two boys.
    b. restrictors of definites
        John hired those/the two boys.
    c. generic
        Three boys can lift a piano.
    d. narrow scope existential
        John hired two workers.
    e. wide scope and island-escaping behaviors
        If John hires two workers, he will be in good shape. if > two or two > if
f. intermediate scope and island-escaping behavior
   Every professor will rejoice if three students of his do well on the exam.
   every > if > three or every > three > if

g. lack of anaphoric use
   John bought three dogs and five cats. #(The/Those) Five cats very expensive.

(15) French bare numeral-noun phrases
a. predicative
   *Ils sont deux étudiants*
   They are two students
   ‘They are two students.’

b. restrictors of definites
   *Les /ces deux chats*
   The/these two cats
   ‘The/these two cats’

c. generic
   *Deux garçons peuvent soulever un piano.*
   two boys can raise a piano
   ‘Two boys can lift a piano.’

d. narrow scope existential
   *J'ai vu deux chiens.*
   I saw two dogs
   ‘I saw two dogs’

e. wide scope and island escaping behavior
   *Si tu apportes deux filles à la fête, j'en serai heureux.*
   If you bring two girls to the festival I will happy
   ‘If you bring two girls to the party I will be happy’ two > if or if > two

f. intermediate scope and island escaping behavior
   *La plupart des professeurs ont lu chaque essai.*
   the most of professors have read every essay
   que deux étudiants ont écrit
   that two students have written
   ‘Most professors have read every paper that two students wrote.’
   most > two > every or most > every > two

g. lack of anaphoric use
   *Jean a acheté deux chiens et deux chats.*
   John has bought two dogs and two cats.
   #(Les)/ #(ces) deux chats sont coûteux.
   The/these two cats are expensive
   ‘John bought two dogs and two cats. The/these two cats are expensive.’
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(16)  Russian bare numeral-noun phrases
   a. predicative
       *Ivan i Anna dva studenta*  
       Ivan and Anna two students  
       ‘Ivan and Anna are two students.’
   b. restrictors of definites
       *Eti pjat' koshek*  
       these five cats  
       ‘these five cats’
   c. *Pjat' parnej ne mogut podnjat' pianino.*  
       five boys NEG can lift piano  
       ‘Five boys cannot lift a piano.’
   d. *Ja videla pjat' sobak.*  
       I-nom see.past five dogs  
       ‘I saw five dogs’
   e. *Ja budu schastliv, esli ty pridjosh' na vecherinku s dvumja devushkami.*  
       I-be.fut happy if you come on party with two girls  
       ‘If you bring two girls to the party, I will be happy.’
   f. *Bol'shinstvo professorov prochitali kazhdju rabotu chto napisali dva studenta.*  
       most professors read every paper that wrote two students  
       ‘Most professors have read every paper that two students wrote.’
   g. lack of anaphoric use
       *Ivan kupil pjat' sobak i pjat' koshek.*  
       Ivan bought five dogs and five cats.
       *(Eti) pjat' koshek ochen' dorogie.*  
       these five cats very expensive  
       ‘Ivan bought five dogs and five cats; these five cats are very expensive.’

In contrast with bare numeral-nouns phrases, which receive an indefinite interpretation and allow narrow scope, wide scope and intermediate scope behaviors as well as the island-escaping behavior, bare nominals across languages only receive a narrow scope existential reading and disallow wide scope or intermediate scope or island escaping behaviors (e.g., see Carlson 1977a, b; Longobardi 1994; Chierchia 1998b; Dayal 2004. c.f. Chapter 2 and Chapter 4), as demonstrated with examples from English, Italian and Russian:

(17)  English bare nominals
   a. Miles wants to meet *policemen.*  
       *want > Ǝ/*Ǝ > want*
   b. John didn’t see spots on the floor.  
       ¬ > Ǝ/*Ǝ > ¬  
       (Carlson 1977b: 16, 19)
Implications on nominal argument formation in general

(18) Italian bare nominals
a. *Voglio conoscere belle ragazze.
   I want meet beautiful girls
   ‘(I) want to meet beautiful girls.’ \( \text{want} > \exists/\exists > \text{want} \)
b. *Non ho conosciuto belle ragazze.
   not have meet beautiful girls
   ‘(I) didn’t meet beautiful girls.’ \( \neg > \exists/\exists > \neg \) (Chierchia 1998b: 388)

(19) Russian bare nominals
a. *mne kazhetsja chto v komnate mysh.
   me seems that in room mouse
   ‘It seems to me that there is a mouse in the room.’ \( \text{seem} > \exists/\exists > \text{seem} \)
b. *kot ne sidit na stule.
   cat not sits on stool
   ‘There isn’t any cat sitting on the stool’ \( \neg > \exists/\exists > \neg \) (Dayal 2004: 405)

While number marking languages vary greatly at the bare noun level, they behave uniformly at the bare numeral-noun phrase level. In (20) and (21), I summarize the ways to express (in)definiteness and kind and the distribution of bare nominals in number marking languages.

(20) Summary of ways to express (in)definites and kinds in number marking languages

<table>
<thead>
<tr>
<th></th>
<th>Germanic languages</th>
<th>Romance languages</th>
<th>Hindi/Slavic languages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>German</td>
<td>French</td>
</tr>
<tr>
<td>a. def</td>
<td>an overt D</td>
<td>an overt D</td>
<td>an overt D</td>
</tr>
<tr>
<td>b. indef</td>
<td>an overt D</td>
<td>Num-NPs</td>
<td>an overt D</td>
</tr>
<tr>
<td>c. kind</td>
<td>def singulars</td>
<td>def singulars</td>
<td>def singulars</td>
</tr>
<tr>
<td></td>
<td>*def plurals</td>
<td>*def plurals</td>
<td>*def plural mass</td>
</tr>
<tr>
<td></td>
<td>bare plural mass</td>
<td>bare plural mass</td>
<td>bare plural mass</td>
</tr>
</tbody>
</table>

(21) Summary of distribution of bare nominals in number marking languages

<table>
<thead>
<tr>
<th></th>
<th>Germanic languages</th>
<th>Romance languages</th>
<th>Hindi/Slavic languages</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>German</td>
<td>French</td>
</tr>
<tr>
<td>a. bare singulars</td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>b. bare plural mass</td>
<td>√</td>
<td>√</td>
<td>*</td>
</tr>
</tbody>
</table>

Compared with number marking languages, which vary in a great deal in whether or not bare nominals are freely allowed in argument position (21) as well as in how the kind interpretation is expressed (20c), classifier languages have a stable argument system, i.e. their bare nouns are freely allowed in argument position and can freely refer to kinds
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(22c); however, classifier languages do vary more widely in how definiteness and indefiniteness are expressed (22a) and (22b) (c.f. Chapter 5).

(22) Summary of ways to express (in)definites and kinds in classifier languages

<table>
<thead>
<tr>
<th></th>
<th>SVO</th>
<th>SOV</th>
</tr>
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<tbody>
<tr>
<td>a. def</td>
<td>bare Ns</td>
<td>(?)bare Ns bare ClPs</td>
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<td></td>
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<td>(?)bare Ns bare ClPs</td>
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<td></td>
<td></td>
<td>bare Ns Num-ClPs</td>
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<td></td>
<td></td>
<td>(?bare Ns bare ClPs</td>
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<td></td>
<td></td>
<td>Num-ClPs</td>
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<tr>
<td></td>
<td></td>
<td>bare Ns</td>
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<tr>
<td></td>
<td></td>
<td>Num-ClPs word order</td>
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<tr>
<td></td>
<td></td>
<td>bare Ns an overt D</td>
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<td></td>
<td></td>
<td>bare Ns</td>
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<tr>
<td></td>
<td></td>
<td>bare Ns bare ClPs</td>
</tr>
<tr>
<td>b. indef</td>
<td>Num-ClPs (restricted)</td>
<td>Num-ClPs bare ClPs (restricted)</td>
</tr>
<tr>
<td></td>
<td>Num-ClPs bare ClPs</td>
<td>Num-ClPs bare ClPs</td>
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<td>Num-ClPs</td>
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<td>Num-ClPs bare ClPs</td>
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<td>c. kind</td>
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<td>bare Ns</td>
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</table>

note: I use the question mark '?' in (96) to mark the cases that are controversial in the literature.

In the next section, I will discuss the syntax of nominal arguments and the analysis of variation in number marking languages. It will be shown that the proposed analysis of nominal arguments in classifier languages fit well into a wider range of languages.

6.2.2 The syntax of nominal arguments: to D or not to D?

The purpose of this section is to show that the two main parameters in the nominal domain [±D] and [±ARGunrestricted], which capture variation in classifier languages (c.f. Chapter 5) also capture number marking languages.

Two main approaches have been pursued in the literature to account for the syntax of nominal arguments across languages. The first approach assumes a universal structure of nominal arguments, i.e. DP, and a fixed denotation of nouns (i.e. properties or kinds). This approach is defended by Longobardi (1994 et seq), Zamparelli (1995, 2000), Borer (2005), Simpson (2005), among many others (c.f. Chapter 2). The other approach assumes varying structures of nominal arguments and variable mapping of the denotations of nouns. This approach is defended by Fukui (1988), Chierchia (1998b, 2010), Dayal (2004, 2012b), Bošković (2005 et seq), among others (c.f. Chapter 2 — 4).

This book defends the second approach instead of the first one. Detailed arguments from Mandarin advanced in Chapter 2 and Chapter 3 have already shown that it is unnecessary to posit a functional category D that is always invisible in Mandarin in order to account for the behavior of nominal arguments in this language. This is arguably a simpler analysis of Mandarin nominal phrases since it avoids stipulating the presence of invisible function projections, namely DPs, that otherwise have no overt manifestation in this language.

This book also argues for the view that nouns in classifier languages denote kinds and are argumental [+arg, −pred], as first proposed in Krifka (1995) and further developed in Chierchia (1998b, 2010) (c.f. Chapter 2, Section 2.4.2 and Chapter 4,
Section 4.8.6). Regarding nouns in number marking languages (including both count nouns and mass nouns), like English, French, Italian, Hindi and Russian, I adopts the views that they are property-denoting and are not argumental \([-\text{arg}, +\text{pred}]\), as developed in Chierchia (1998b, 2010) and Dayal (2004).\(^4\)

Number marking languages, based on the varying structure of nominal arguments, should come in two varieties: those with D and those without, which correspond to the two types of classifier languages discussed (e.g. Nuosu Yi and Mandarin). Following this analysis, Romance languages and Germanic languages, which have visible evidence of D, are arguably number marking languages with D \([+D]\) (23a); whereas Hindi and most Slavic languages which do not have a visible manifestation of this category are number marking languages without D \([-D]\) (23b) (e.g. see Dayal 2004; Bošković 2005, et seq).

\begin{equation}
(23) \quad \text{Structure of nominal arguments in number marking languages: DP versus NP}
\end{equation}

\begin{itemize}
\item a. English, Italian, French
\item b. Hindi, Russian and most Slavic languages
\end{itemize}

\begin{tabular}{c|c}
| D | NP |
\hline
NP & N |
\end{tabular}

I suggests that, in addition to varying with respect to whether or not they have the functional category D in their grammar, number marking languages also vary regarding whether or not they freely utilize covert argument formation operations (e.g. see Chierchia 2016, c.f. Chapter 2, Section 2.5.3). Both the null D in the syntax and the covert type-shifting in the semantics are invisible argumentizing operations, which have been referred to as ARG in this work (c.f. Chapter 2, Section 2.5.3 and Chapter 4, Section 4.8.3). To anticipate, if a language does not employ ARG freely, then its bare nouns cannot be argumentized freely; if a language employs ARG freely, its bare nouns can be argumentized, occurring freely in any argument position. On this view, French and Italian

\(^4\) In Chierchia's (1998b) Nominal Mapping Hypothesis, nouns are subject to parameterization and have three variation: \([-\text{arg}, +\text{pred}], [+\text{arg}, -\text{pred}], \text{and } [+\text{arg}, +\text{pred}]. If nouns in a language are predicative and are not argumental (i.e. \([-\text{arg}, +\text{pred}]), they cannot combine with verbs directly and need to be argumentized obligatorily through the functional category D. This type of languages is instantiated by French and Italian. In \([+\text{arg}, -\text{pred}]\) languages, all nouns refer to kind and are argumental; therefore these languages freely allow bare nouns as arguments. Classifier languages like Mandarin are treated to be this type. In \([+\text{arg}, +\text{pred}]\) languages, count nouns are predicative and need to be argumentized via overt Ds if available, whereas mass nouns are assumed to be argumental, and as a consequence they can appear freely in argument position. Slavic languages and Germanic languages are assumed to fall under this category.

Dayal (2004) adopts Chierchia’s (1998b) Nominal Mapping but proposes a different analysis of languages like Russian and Hindi. Instead of treating nouns in these languages as \([+\text{pred}, +\text{arg}], Dayal groups their nouns as \([+\text{pred}, -\text{arg}], the same as those in French and Italian. Dayal argues that Hindi and Russian employ type-shifting in semantics to turn their predicative nouns into arguments instead of using a null D in the syntax based on two main arguments: (i) bare nouns in Hindi are not subject to any ECP-type of syntactic constraint as those in Italian, and (ii) there is any overt determiner attested in these languages.

Chierchia (2010) adopts Dayal's (2004) modification and simplifies the Nominal Mapping. Specifically, Chierchia (2010) argues for a view that the mass-count distinction is a matter of vagueness. Chierchia (2010: 123-143) further focuses on number marking languages (English specifically) and classifier languages and proposes that classifiers and obligatory singular/plural marking are two different ways of ensuring that a property is atomic and hence useful for counting and that the choice between the two depends on whether nouns are coded as kinds or as properties (but not as both).
would be classified as \([-\text{ARG}_{\text{unrestricted}}]\), and English, Hindi and most Slavic languages would be classified as \([+\text{ARG}_{\text{unrestricted}}]\).

Specifically, number marking languages without D, as they lack D in their grammar, never project DP in the syntax to argumentize property-denoting nominal. Therefore, covert type-shifting operations in the semantics must be allowed to form arguments, accounting for why bare nominals in these languages can freely serve arguments (c.f. (2), (7), (12)). For a detailed analysis of argument formation in the semantics in number marking languages without D, I refer the readers to Dayal (2004).

(24) Argumentize bare nouns via semantic type-shifting (e.g. Hindi and Russian)

\[
\begin{array}{c}
\text{ARR} \\
\mid \\
\text{N} \\
\text{cuuhaa 'mouse'} \\
\text{kuute 'dogs'} \\
\text{kutta 'dog'} \\
\text{mal'chik 'boy'} \\
\text{devocka 'girl'} \\
\text{ljudi 'men'}
\end{array}
\]

On the other hand, number marking languages with D project D in the syntax to argumentize nominals (23b). But they further split into two subtypes, those that freely allow bare arguments, such as English and German (c.f. (9)) and those that do not, like French and Italian (c.f. (10) and (11)). I will discuss these two subtypes in term.

With regard to number marking languages that have the functional category D but also allow bare nominals to freely occur in argument position (e.g. English bare plurals \(\text{whales}\)), their bare nouns can have two ways to be argumentized. One is through a null D in syntax (25a) (e.g., see Bošković 2005, et seq; Chierchia 2016); the other is via a covert type-shifting operation in semantics that plays the same role (25b) (e.g., see Chierchia 1998b).

(25) Two options to argumentize bare nouns in languages with D (e.g. English)

a. null D in the syntax

\[
\begin{array}{c}
\text{DP} \\
\text{D}_{\text{null}} \\
\text{ARG} \\
\text{NP}
\end{array}
\]

b. Covert type-shifting in the semantics

\[
\begin{array}{c}
\text{ARG} \\
\text{NP}
\end{array}
\]

I adopt the analysis in (25a), namely if a language has the functional category D in its grammar already, argumentizing property-denoting bare nominals should be achieved by projecting a (possibly null) DP, and consider empirical evidence from Bošković (2005, et seq), which will be introduced below.

Bošković (2005, et seq) argues that extraction out of nominal phrases varies cross-linguistically depending on whether the language has or lacks lexical DPs. Specifically, Bošković observes that a number of grammatical phenomena correlate with the presence or absence of determiners in the nominal domain. He makes a number of
syntactic and semantic generalizations where D plays an important role. Two robust generalizations concern Left Branch Extraction (adjectival adjunct extraction specifically) and Complement Extraction:

(26) Two of the generalizations in Bošcović (2005 et seq)
  a. Languages with overt D: (i) may allow Complement Extraction (CE); but (ii) disallow Left Branch Extraction (LBE).  
  b. Languages without overt D: (i) may allow Left Branch Extraction; but (ii) disallow Complement Extraction.

I will demonstrate the generalizations in (26) with English and Serbo-Croatian, which represent languages with overt D and those without respectively.

Serbo-Croatian allows Left Branch Extraction of the sort in (27), in which the adjectival adjunct *lijepe* ‘beautiful’ can be extracted to the sentence initial position to receive a focused interpretation. However, it disallows Complement Extraction like the ones in (28).

(27) *Li Ke p e, je vidio [t i kuče]. (Serbo-Croatian: LBE)
    beautiful is seen houses
    ‘Beautiful houses, he saw.’ (Bošković 2005: 2, ex (2d))

(28) a. *Ovog studenta, sam pronašla [knjigu t i]
    this student(gen) am found book
    Intended: ‘Of this student I found the book’
    b. *Koga, si pronašla [knjigu t i]
    who (gen) are found book
    Intended: ‘Of whom did you find the book’
    (Zlatić 1997, c.f. Bošković 2011b: 15, ex (91a, b))

In contrast, English disallows the same sort of Left Branch Extraction (29) but permits Complement Extraction (30).

(29) *Beautiful, he saw [t i houses]. (English: *LBE)
    (Bošković 2005: 2, ex (1d))

(30) a. Of which city did you witness the destruction?
    (Huang 1982, Chomsky 1986)
    b. Of whom do government employees see pictures every day? (English: CE)
    (Bach and Horn 1976, c.f. Bošković 2011b: 20, ex (115b)))

---

5 It is very important to note that it is not the case that all languages without D allow LBE; lots of languages without D also disallow LBE. However, the key point of Bošković’s generalization is that LEB will only be allowed in languages without overt D. (See Bošković 2010 et seq for discussion and analyses of these languages.)

6 Bošković provides evidence from a large variety of languages in addition to English and Serbo-Croatian, to support his generalizations. I refer the readers to Bošković (2005, et seq) for details.
The contrastive behaviors in the clausal domain, as argued by Bošković, could not be accounted for by assuming the same internal nominal structure, i.e. DP, in both languages. Rather, these different extraction behaviors suggest an internal nominal domain difference. According to Bošković, languages without overt determiners are NP-languages which do not project DP in the syntax; while languages with overt determiners are DP-languages and always project DP. Serbo-Croatian and English, therefore, have different nominal structures. Bošcović then explains the extraction differences between Serbo-Croatian and English based on the Phase Impenetrability Condition (PIC) and Anti-Locality:  

\[(31) \quad \text{Phase Impenetrability Condition (Chomsky 2000)}^8 \]

In phase $\alpha$ with head H, the domain of H is not accessible to operations outside $\alpha$; only H and its edge are accessible to such operations.

\[(32) \quad \text{Anti-Locality (e.g. Bošković 1994, 1997; Saito and Murasugi 1999)}^9 \]

Movement needs to cross at least one full phrase (not just a segment).

According to PIC, in order for material in the phase complement domain to remain accessible for further operations, it must move to the edge of that phase head; thus allowing an extra Spec to the phase phrase. Such a movement out of the phase complement domain has an effect on the surface semantic interpretation, such as forming wh-question, topicalization or being interpreted as focus (i.e. the Effect on Output Condition, in Chomsky 1995, 2000, 2001).

Regarding what counts as a phase, v, C, and D have been assumed by many authors to be phases, which represent the highest domain of ‘full argument structure’, ‘tense and force’ and ‘nominal structures’ respectively. If D is a phase, in languages without D, other functional category in the nominal domain can be a phase (e.g. see Narita 2011, 2013, Bošcović 2012a, b, 2014). Specifically, Bošcović (2012a, b, 2014) argues that the highest phrase in a traditional nominal phrase counts as a phase; thus there is no variation in the phasehood of the nominals between languages with overt D and languages without (c.f. Bošcović 2012b).

With Anti-Locality and PIC, the extraction differences between Serbo-Croatian and English receive a uniform explanation. Let us look at English first. In (33a), if the AP beautiful needs to keep accessible to further derivation (e.g. to move to Spec CP to

---

7 Bošcovic also provides another account for Left Branch Extraction differences, based on Abney 1987, see Bošcovic (2005, Section 4.2) for details.
8 Chomsky (2000 et seq) proposes that syntactic computations proceed in incremental ‘chunks’, called phases. Each phase is divided to two sub-domains— the complement domain (sister of the phase head) and the edge domain (the phase head and specifier(s)/adjuncts):
receive a focused interpretation), it has to move to the DP edge first (due to PIC). However, Anti-Locality prevents such a movement since it is too short: this movement does not cross a full phrase but only a segment, as underlined in (31a) (NP-adjunction creates two segments of NP, e.g. see Chomsky 1981). The adjunct ‘beautiful’ cannot move directly to Spec CP by skipping Spec DP either because of PIC. Thus, the failure of moving out of DP explains why English disallows Left Brach Extraction (29). On the contrary, the PP complement of whom in (33b) is allowed to move to Spec DP given that this movement crosses a full phrase, i.e. NP; this accounts for the fact that Complement Extraction is allowed in English (30).

(33) Left Branch Extraction and Complement Extraction in English
a. *LBE: anti-locality or PIC violated  
   \[\text{DP} \rightarrow \text{DP (phase)} \rightarrow \text{AP} \rightarrow \text{NP} \rightarrow \text{N} \rightarrow \text{PP} \rightarrow \text{of whom}\] 
b. CE: no anti-locality violated  
   \[\text{DP} \rightarrow \text{DP (phase)} \rightarrow \text{NP} \rightarrow \text{N} \rightarrow \text{PP} \rightarrow \text{of whom}\]

In Serbo-Croatian (34a), the anti-locality and PIC violation would not arise because the AP lijepe ‘beautiful’ can move directly out of NP phase to a higher position as it is already at the phase edge and is accessible for further operation (due to PIC). This explains why Serbo-Croatian allows Left Brach Extraction (27). As for Complement Extraction (34b), in order to avoid being sent to spell-out and to move to Spec CP, the PP complement koga ‘who-gen’ must move to the NP phase edge. However, the same as Left Branch Extraction in English (33a), this movement is banned since it does not cross a full phrase but only one segment of NP. This explains why Complement Extraction in Serbo-Croatian is impossible (28).

(34) LBE and CE in Serbo-Croatian
a. LBE: AP is at phase edge already  
   \[\text{NP} \rightarrow \text{AP} \rightarrow \text{lijepe} \rightarrow \text{NP (phase)} \rightarrow \text{N} \rightarrow \text{kuće} \rightarrow \text{‘houses’}\] 
b. CE: anti-locality and PIC violated  
   \[\text{NP} \rightarrow \text{AP} \rightarrow \text{lijepe} \rightarrow \text{NP (phase)} \rightarrow \text{N} \rightarrow \text{knjigu} \rightarrow \text{‘book’} \rightarrow \text{PP} \rightarrow \text{koga} \rightarrow \text{‘who-gen’}\]
Bošković’s analysis not only provides a uniform account for extraction variation across languages, but also it provides evidence that that bare arguments in English, like *whales* and *dogs* in (9), project DP, with D being null (25a)/(33a) (as repeated in (35)).

\[
\text{(35) Argumentize bare nouns freely via null D (e.g. English)}
\]

\[
\text{DP} \\
\text{D_{null}} \quad \text{NP} \\
\text{ARG}
\]

Regarding the interpretation of ARG, it ranges over \(\cap\), \(\iota\), and \(\exists\) (36) and is subject to *Blocking Principle* (37a) and *Ranking of Meaning* (37b) (c.f. Chapter 2, Section 2.5.3). In English, the null D has to be interpreted only as kind via Nom in (36) given that overt lexical definite determiner *the* and indefinite determiners *a/an* block null Ds from being interpreted as definite and indefinite. This accounts for the fact that definite and indefinite in English are expressed via overt determiners (1), whereas kinds are expressed via bare nominals (3a). Note that bare plurals in English can receive a narrow scope existential reading (c.f. (17)); such a reading can be derived from the kind interpretation via *Derived Kind Predication* (DKP) (e.g. Chierchia 1998b, c.f. Chapter 2, Section 2.5.3). Regarding how definite singulars in English (e.g. *the dinosaur* in (2a)) receive a kind interpretation, I refer the readers to Dayal (2004) for details.

\[
\text{(36) Three canonical argument forming type-shifts (ARG):}
\]

\[(i) \text{Nom(inalize): } \cap P = \lambda s \tau P_s, \text{if } \lambda s \tau P_s \text{ is in } K, \text{ else undefined. } <e,t> \rightarrow <e^k> \\
(ii) \text{Iota: } \iota X = \text{the largest member of } X \text{ if there is one, else, undefined. } <e,t> \rightarrow <e> \\
(iii) \text{Existential closure: } \exists X = \lambda P \exists y [X(y) \wedge P(y)] \quad <e,t> \rightarrow <<e,t>,t>
\]

\[
\text{(37) a. Ranking of Meaning:}
\]

\[(i) \cap > \{\iota, \exists\}; \\
(ii) \{\cap, \iota\} > \exists \text{ (revised in Dayal (2004))}
\]

\b. Blocking Principle (‘Type Shifting as Last Resort’)

For any type shifting operation \(\tau\) and any \(X\): \(*\tau(X)\), if there is a determiner D such that for any set X in its domain, \(D(X) = \tau(X)\) (Chierchia 1998b)

Now, let us turn to number marking languages that have the functional category D but do not allow bare nominals to freely occur in argument position, such as Italian and French (c.f. (10) and (11)). These languages function along the lines discussed in Longobardi (1994) and Chierchia (1998b).

Specifically, French simply do not employ null Ds to argumentize their bare nouns. Italian does not employ null D unrestrictedly but in restricted positions, such as ‘lexically governed’ positions and certain positions in the left periphery (Longobardi 1994; Chierchia 1998b, c.f. (10)); the null D is subject to licensing conditions such as ECP. Regarding the interpretation of the null D in Italian, it behaves the same as that in English as we discussed above: it can only be interpreted as kind or existential via Nom
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in (36) and DKP. Regarding why definite plurals in Romance languages can receive a kind interpretation (c.f. (4a) and (5a)), I refer the readers to Chierchia (1998b) and Dayal (2004).

(38) Argumentize bare nouns restrictedly via null D (e.g. Italian)

\[
\begin{array}{c}
\text{DP} \\
\text{D}_{\text{null}} \quad \text{NP} \\
\text{ARG}
\end{array}
\]

Since neither Italian nor French employ null D unrestricedly, these languages can be classified as \([-\text{ARG unrestricted}]\) languages, which contracts with English, which is a \([+\text{ARG unrestricted}]\) language.

The discussion in this section so far has shown that number marking languages vary in two dimensions: (i) whether or not they have the functional category D in their grammar \([\pm D]\), and (ii) whether or not they freely utilize covert argument formation operations \([\pm \text{ARG unrestricted}]\). These two dimensions of variation, as we saw in Chapter 5, capture classifier languages as well. The variation in nouns regarding what they are coded, as kinds \([+\text{arg}, -\text{pred}]\) or as properties \([-\text{arg}, +\text{pred}]\), differentiates classifier languages from number marking languages. With these parameters, we can update the variation and typology of nominal argument formation across languages:

(39) Variation and typology of nominal argument formation (2nd version)

\[
\begin{array}{c}
\text{N}[+\text{arg}, -\text{pred}] \text{ languages} \\
\uparrow \\
\text{N}[+\text{arg}, +\text{pred}] \text{ languages} \\
\downarrow \\
[+D] \quad [-D] \\
\downarrow \quad \uparrow \\
\text{[+ARG unrestricted]: Cantonese, Bisu} \\
\text{[-ARG unrestricted]: Mandarin, Southern Min, Japanese} \\
\downarrow \\
\text{[+D] \quad [-D]} \\
\downarrow \quad \uparrow \\
\text{[+ARG unrestricted]: English, German} \\
\text{[-ARG unrestricted]: Italian, French} \\
\downarrow \quad \uparrow \\
\text{[+ARG unrestricted]: Nuosu Yi, Bangla, Vietnamese} \\
\text{[-ARG unrestricted]: Thai}
\end{array}
\]
In (39), we have not detected such a number marking language, which lacks D [-D] and disallows bare nominals to occur freely in argument position [-ARG_{unrestricted}]. It remains to be seen whether such a language exists or not.

So far, we accounted for variation of nominal arguments at the bare noun level via varying structures (i.e. DP versus NP) and variable mapping of the denotations of nouns (i.e. kind-denoting versus property-denoting). Nevertheless, it by no means suggests that nominal arguments have no uniform structure across languages. As we saw in Section 6.2.1, although number marking languages vary greatly at the bare noun level, they behave uniformly at the bare numeral-noun phrase level (c.f. (14) - (16)). Indeed, bare numeral containing phrases in number marking languages and those in classifier languages behave uniformly in terms of their distribution, interpretation, and scope behaviors, as we saw in Chapter 2. The remarkable cross-linguistic properties of bare numeral containing phrases have led us to a uniform D-less structure (40) and a uniform analysis of the semantics of bare numerals (41) (c.f. Chapter 2, Section 2.2 and Section 2.3.1).

(40) Uniform D-less structure of bare numeral-(classifier-) noun phrases

\[
\begin{array}{c}
\text{DivaP (CIP)} \\
\text{NumP} \\
\text{n} \\
\text{Diva (Cl)} \\
\text{NP}
\end{array}
\]

(41) Lexical view of ambiguous bare numerals

i. Numerical_{<e, t>, <e, t>} = \lambda P \lambda x [n (x) \land P(x)]

ii. Numerical_{<e, t>, e} = \lambda P_3 (\lambda x [n (x) \land P(x)])

If \(\alpha\) $$\in$$ Numerical_{<e, t>, <e, t>}, then \(\lambda P_3 (\lambda x [n (x) \land P(x)]) \in$$ Numerical_{<e, t>, e}

\(P_3\) is subject to existential closure at arbitrarily chosen scope sites.

The above D-less structure together with the semantics of bare numerals, as we saw in Chapter 2, account for the cross-linguistic behaviors of bare numeral noun phrases.

Having seen that the proposed analysis of nominal arguments in classifier languages as developed in Chapter 2 to 5 can fit into the well-established number marking languages, I will discuss in the next section two less-discussed languages, Yudja and Lhasa Tibetan, both of which have neither a general classifier system (unlike Mandarin or Nuosu Yi) nor obligatory singular/plural marking on nouns (unlike English or Hindi). As we shall see, the proposed uniform analysis of bare numeral containing phrases (40) can also accommodate these two types of languages if we allow the overtness at PF of the functional head in the uniform structure to be subject to variation (e.g. Borer 1984, Chomsky 1995, Kayne 2005b, 2013).

6.3 Two other types of languages: same syntax but silent functional head

In this section, I will report on Lima's (2010, 2012, 2014) work on Yudja, a language of the Juruna family, Tupi stock, spoken by approximately 300 people in the Xingu
Indigenous Territory in Brazil (Lima 2014: 13), and Chen and Jiang's (2016) work on Lhasa Tibetan, one of the Tibetan dialects spoken in an area of Central Tibet surrounding the city of Lhasa, China (Chen and Jiang 2016). I will show a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages at the numeral-noun level. We will see that the D-less structure of bare numeral noun phrases in (40) can be extended to account for the nominal arguments in these two types of languages if we assume the functional head Div/Cl is silent in these languages (e.g. Lima 2010, 2012; Zhang 2013: 246-250; Chierchia 2014):

(42) a. Languages with silent Div  
   b. Languages with silent Cl

\[
\begin{array}{c}
\text{DivP} \\
\hline
\text{NumP} \quad n \\
\text{Div'} \quad n \\
\text{Div}_{null} \quad \text{NP} \\
\text{Cl}_{null} \quad \text{NP} \\
\text{ClP}
\end{array}
\]

Both of Yudja and Lhasa Tibetan are determiner-less, head-final languages; its bare nouns are freely allowed to appear in argument position, with the same range of interpretations as those in Mandarin (see Lima 2014 for Yudja; see DeLancey 2003 and Chen and Jiang 2016 for Lhasa Tibetan):\(^\text{11}\)

(43) Yudja bare nouns behave like those in Mandarin
   a. Takũ masehu txa. [kind] 
      mutum extinction go 
      ‘The mutum (a Brazilian bird) will become extinct.’
   b. Ka’apa apeta a anu. [generic] 
      insect blood like ASP 
      ‘Insects like blood.’
   c. Ali ba’i ixu. [definite, existential] 
      child paca eat 
      ‘The child(ren) eat(s)/ate the/a/some paca(s).’
      Lit.: an undefined number of children eat(s)/ate an undefined number of pacas.  
      (Lima 2014: 33-34)

(44) Lhasa Tibetan bare nouns behave like those in Mandarin
   a. dom rtsamed phyin shag. [kind] 
      bear extinct from-now-on PERF 
      ‘Bears are extinct.’
   b. khvi sphyangpo red. [generic] 
      dog clever be 
      ‘Dogs are clever.’

---

\(^{11}\) Tibetan belongs to the Bodic branch of Tibeto-Burman languages in the Sino-Tibetan language family (e.g. Shafer 1955; DeLancey 2003). Lhasa Tibetan is the best-known contemporary Tibetan dialect, with a SOV word order (DeLancey 2003: 270-283; Denwood 1999, c.f. Chen and Jiang 2016).
As can be seen in (43) and (44), bare nouns in Yudja and Lhasa Tibetan are not marked with number morphology and can be interpreted as singular or plural. The paradigm above fits in with the description of classifier languages like Mandarin and Nuosu Yi, as we saw in Chapter 2 and Chapter 4.

Lhasa Tibetan and Yudja, however, differ in how their nouns combine with numerals. Lhasa Tibetan behaves like number marking languages in freely allowing numerals to combine with notional count nouns (45) but requiring a measure word to combine with notional mass nouns (46).

(45)

a. Nyimas deb gcig/gnyis nyo song. (Lhasa Tibetan)
   Nyima-erg book one/two buy PST
   ‘Nyima bought one book/two books.’

b. Nyimas mi gnyis glas na gzugspo thangpo chags gi red.
   Nyima-erg person two hire if body healthy become would be
   ‘If Nyima hires two persons, he would become healthy.’ if > two; two > if

(Chen and Jiang 2016)

(46)

a. grozhib *(rgyama) gnyis
   flour catty two water cup three
   ‘two catties of flour’ ‘three cups of water’

b. chu *(phorpa) gsum
   ‘three cups of water’

c. ja *(snakha) bzhi
   tea type four sand pile two
   ‘four types of tea’ ‘two piles of sand’

d. khra *(thigs) gnyis
   blood drop two
   ‘two drops of blood’

(Chen and Jiang 2016)

Languages similar to Lhasa Tibetan include Dëne Sųliné (Athabaskan family) (Wilhelm 2008), and Karitiana, (Arikém family) (Müller et al. 2006):

(47)

a. sółághe bek’eshich’elyì
   five table
   ‘five tables’

b. sółághe *(nedádhi) bér
   five pound meat
   ‘five pounds of meat’

(Wilhelm 2008: 46-47)
(48) a. \( yn \ naka-'y-t \ sypom+t \ pikom \). (Karitiana)
    1s decl-eat-nfut two monkey
    ‘I ate two monkeys’
b. \( jonso \ naka-ot-Ø \ sympom-t *(byt-ypip) \ ese \).
    woman decl-bring-nfut two-obl bowl-in water
    ‘The woman brought two bowls of water’ (Müller et al. 2006: 122, 133)

In contrast, Yudja freely allows all nouns to combine directly with numerals, regardless of whether they are notional count or mass (c.f. Lima 2014: 37):

(49) \( Txabiu \ ali \ wana \). (Yudja)
    three child ran
    ‘Three children ran’ (Lima 2014: 38)

(50) a. \( Maria \ vauda \ y’a \ dju \ wi \). (Yudja)
    Maria two water bring
    ‘Maria brought two (portions of) water’ (Lima 2014: 39)
b. UNCONVENTIONAL CONTEXT: Someone brought a container of water and let one drop fall near the school, another drop near the hospital and a last drop near the river (all drops are different in size and form).
    \( Txabiu \ y’a \ ipide \ pe~pe~pe \).
    three water on the floor drip~RED
    ‘Three (drops of) water dripped on the floor (in different events)’ (Lima 2014: 55)

In (49), the notional count noun 'child' combines directly with the numeral; such a behavior is kind of expected. The mass noun 'water', however, can also combine directly with a numeral: it receives a 'conventional context' interpretation in (50a) and a 'unconventional context' interpretation in (50b) (c.f. Lima 2014: 37-62). The case of the unconventional context is clearly different from what happens in number marking languages and in classifier languages, in which uses of notional mass nouns such as those in (50b) are disallowed.

Note that, Yudja has container nouns and a few classifiers that can be used with the numeral-noun phrase, but they are not obligatory (Lima 2014: 39-64):

(51) a. \( Maria \ vauda \ y’a \ karaha *(he) \ dju \ wi \).
    Maria two water bottle in bring
    ‘Maria brought two bottles of water.’
    Lit.: ‘Maria brought two (portions of water) in bottles.’ (Lima 2014: 40)

---

12 Lima (2014: 50-62) examines with a wide variety of unconventional contexts and notional mass nouns, including liquid substances (e.g. water, oil, and honey), non-liquid substances (e.g. salt, sugar, rice, and flour), body fluids (e.g. blood and saliva), and natural substances (e.g. rain and sand).
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b. Yaba vauda kania atxa akiri.

Yaba two meat piece cut

‘Yaba cut two pieces of meat’ (Lima 2014: 64)

While Yudja differs from classifier languages in not having obligatory classifiers, its notional count and mass nouns behave alike when combining with a numeral, and its bare nouns can freely serve arguments and denote kinds (c.f. (43), (49), (50)). Lima (2010, 2012, 2014: 88-105) argues that bare nominals in Yudja denote kind, like those in Mandarin. But unlike Mandarin, Yudja adopts a family of covert operation to map a kind to a number neutral property of specimens of the kind, of subkinds or of the kind itself. Such covert operations are similar to the overt classifiers in Mandarin; in the syntax, these covert operations can are realized as a silent function head (see also Zhang 2013: 247-248; Chierchia 2014: 169-172). The syntax of the numeral noun phrase in Yudja can be captured as the following:  

\[
(52) \quad \text{Yudja with a silent Cl}
\]

\[
\begin{array}{c}
\text{CIP} \\
\text{ClP} \\
\text{Cl'} \\
\text{txabiu} \\
\text{'three'} \\
\text{Clnull} \\
\text{null} \\
\text{ali} \\
\text{'child'} \\
\text{y'a} \\
\text{'water'} \\
\end{array}
\]

Regarding Lhasa Tibetan (c.f. (44), (45), (46)), we can also assume a silent functional head in the numeral noun phrase. Specifically, I will adopt Zhang's (2013: 247-248) silent functional head analysis of Dëne and Karitiana and extend it to Lhasa Tibetan:

\[
(53) \quad \text{Languages with a silent functional head}
\]

\[
\begin{array}{c}
\text{UnitP} \\
\text{NumP} \\
\text{solaghe} \\
\text{'five'} \\
\text{Unitnull} \\
\text{null} \\
\text{sypom+t} \\
\text{'two'} \\
\text{bekeshichelyi} \\
\text{'table'} \\
\text{pikom} \\
\text{'monkey'} \\
\end{array}
\]

\[13\text{ In Lima (2014: 88-105), the nominal head } n \text{ is used to realize in the syntax the a family of covert operations, which maps the kind denoted by a root to a number neutral property of specimens of the kind, of subkinds or of the kind itself.}\]
The silent Unit in Zhang (2013: 227-248) hosts individual classifiers and other measure words but not the plural marker in order to cover the possible co-occurrence of a classifier and a number marker in the same construction. This work, instead, follows Borer (2005) and assumes the classifier and the canonical number morphology such as -s/-es in English appear in the same functional head (Div or Cl), as seen in (40) (c.f. Chapter 2, Section 2.4). To account for the co-occurrence of classifiers and number morphology or the co-occurrence of double plurals, I adopt the split analysis of plurality (e.g. Wiltschko 2008; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zareikar 2015; Kramer 2009, 2010, 2016) and demonstrate how it works in classifier languages like Mandarin (c.f. Chapter 3, Section 3.5).

Turning back to Lhasa Tibetan, its bare nouns has been treated as property-denoting in Chen and Jiang (2016) given that notional count nouns can combine directly with numerals, in the same way as those in number marking languages (c.f. (45) and (46)). On this view, Lhasa Tibetan can be treated like number marking languages, with a silent functional head Div:

(54) Lhasa Tibetan with silent Div/Cl

In Chapter 2 (Section 2.2.2.), I adopt the assumption that numerals phrasal in the syntax. In Lhasa Tibetan, numerals can merge in as the specifier of DivP, in the same way as those in other languages do (54a), and NP-fronting can be assumed to derive the observed word order [NP Num] (c.f. Chapter 4, Section 4.8.2). Alternatively, numerals can merge in as the modifier of DivP (54b), resulting in the observed word order [NP Num]. I will keep these two options open for now and leave the details for future studies. Given that

14 There seems to be some arguments in favor of the analysis in (54b). First, adjectives in Lhasa Tibetan appear in the position following nouns and require a suffix -po (DeLancey 2003: 275) (i). Numerals in Lhasa Tibetan behave similarly to adjectives: they usually follow demonstratives (56a) but can also appear in the form and position of adjectives, preceding the demonstratives (56b) (c.f. DeLancey 2003: 273) (ii).

(i)   deb yag =po
     book good-Po
     'good book'    (DeLancey 2003: 275)

(ii)  a. deb de gnyis
     book that two
     'those two books'

 b. deb gnyi=po de
    book two-po that
    'those two books'   (DeLancey 2003: 273)

Second, the analysis in (54b) can be directly extended to phrases containing numerals and measure words in (46); whereas the one in (54a) requires further stipulations in the syntax in order to derive the observed word order.
bare nouns in Lhasa Tibetan are property-denoting, the same as those in number marking languages, covert argument forming operations (ARG) are needed to apply freely to the bare nouns, allowing them to serve freely as arguments (44). The different interpretations of the bare nouns can also derived in a principled manner under the Neocarlsonian approach to bare nominals adopted in this work (c.f. Chapter 2, Section 2.5.3), and I refer the readers to Chen and Jiang (2016) for the details.

In this section, I discussed Yudja and Lhasa Tibetan, both of which have neither a general classifier system nor obligatory singular/plural marking on nouns nor article determiners. I showed a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages in the nominal domain, based on Lima (2010, 2012, 2014) and Chen and Jiang (2016). Building on Lima (2010, 2012, 2014), Zhang (2013), and Chierchia (2014), I treat Yudja as a language in which nouns denote kinds and which has a silent Cl and Lhasa Tibetan a language which has a silent Div and freely allows covert argument formation operations on its property-denoting bare nouns. The discussion on Yudja and Lhasa Tibetan leads us to another dimension of variation of nominal arguments, i.e. languages differ in whether the function head Div/Cl is silent or not \([\pm \text{Div}_{\text{silent}}]/[\pm \text{Cl}_{\text{silent}}]\). This dimension of variation, together with the three dimensions of variation discussed in Section 6.2 (i.e. (i) whether nouns are encoded as kinds \([+\text{arg}, -\text{pred}]\) or as properties \([-\text{arg}, +\text{pred}]\), (ii) whether or not languages have the functional category D in their grammar \([\pm D]\), and (iii) whether or not they freely utilize covert argument formation operations \([\pm \text{ARG}_{\text{unrestricted}}]\)) allow us to further update the variation and typology of nominal argument formation across languages:
As we can see, the above four dimensions of variation regarding nominal argument formation not only allows us to capture languages that we have discussed but also they allows us to predict more types of languages, which await further explorations.

In (56), I summarize the languages captured by all of the five dimensions of variation discussed in Chapter 5 and Chapter 6: (i) \([N_{\text{arg, +pred}}]\), (ii) \([\pm Cl_{\text{silent}}]/[\pm Di_{\text{silent}}]\), (iii) \([\pm D]\), (iv) \([\pm ARG_{\text{unrestricted}}]\), and (v) \([\pm \text{one-deletion}]\).
Implications on nominal argument formation in general

(56) Languages attested with $[N_{\text{arg}} \pm \text{pred}]$, $[\pm \text{Cl}_{\text{silent}}]/[\pm \text{Div}_{\text{silent}}]$, $[\pm \text{D}]$, $[\pm \text{ARG}_{\text{unrestricted}}]$, and $[\pm \text{one-deletion}]$

<table>
<thead>
<tr>
<th>Language</th>
<th>$N_{\text{arg}}$</th>
<th>Cl/Div</th>
<th>D</th>
<th>ARG_{unrestricted}</th>
<th>one-deletion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Cl_{silent}</td>
<td>Div_{silent}</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Mandarin</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>b. Cantonese</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>c. Southern Min, Japanese, Korean</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>d. Bisu</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>e. Nuosu Yi, Bangla</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>f. Thai</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>g. Vietnamese</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>h. ?</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>+</td>
</tr>
<tr>
<td>i. Yudja</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>j. ?</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>k. ?</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>l. ?</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>m. Hindi, Russian</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>+</td>
</tr>
<tr>
<td>n. ?</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>o. English, German</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>p. Italian, French</td>
<td>-</td>
<td>N/A</td>
<td>-</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>q. Lhasa Tibetan, Dene, Karitiana</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>r. ?</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>-</td>
<td>N/A</td>
</tr>
<tr>
<td>s. ?</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
</tr>
<tr>
<td>t. ?</td>
<td>-</td>
<td>N/A</td>
<td>+</td>
<td>+</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6.4 Summary

Chapter 6 examined the relationship between nominal argument formation in classifier languages and nominal argument formation more generally. I showed that the analysis of classifier languages developed in the previous chapters can fit into the more well-studied number marking languages (e.g. English, French, Italian, and Hindi) as well as the less-discussed languages which have neither a general classifier system nor obligatory singular/plural marking on nouns (e.g. Yudjia and Lhasa Tibetan).

This chapter started with a discussion on the variable properties and uniform properties concerning nominal arguments in number marking languages. As we saw, number marking languages vary widely regarding the distribution and interpretation of bare nouns and the way how bare nouns form arguments (e.g. obligatorily via an overt D, optionally via an overt D, or not through an overt D). Nevertheless, the behaviors of their
bare numeral-noun phrases remain cross-linguistically constant and differ significantly from those of bare nouns. I showed that variation in number marking languages can be captured by the similar parameters in classifier languages: (i) whether or not they have the functional category D in their grammar [±D], and (ii) whether or not they freely utilize covert argument formation operations [±ARGunrestricted]. The variation in nouns regarding what they are coded, as kinds [+arg, −pred] or as properties [−arg, +pred], further differentiates classifier languages from number marking languages. With these three dimensions of variation, we updated the variation and typology of nominal argument formation.

I further discussed Yudja and Lhasa Tibetan, both of which lack obligatory classifiers or obligatory number marking on nouns. I showed a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages in the nominal domain. Building on Lima (2010, 2012, 2014), Zhang (2013), and Chierchia (2014), I treated Yudja as a language in which nouns denote kinds and which has a silent Cl and Lhasa Tibetan a language which has a silent Div and freely allows covert argument formation operations on its bare nouns. The discussion on Yudja and Lhasa Tibetan led us to another dimension of variation of nominal arguments, i.e. languages differ in whether the function head Div/Cl in bare numeral containing phrases is silent or not [±Divsilent][±Cilsilent]. This dimension of variation, together with the three dimensions of variation discussed earlier in this chapter (i.e. [±arg, ±pred], [±D], [±ARGunrestricted]) allowed us to further update the variation and typology of nominal argument formation across languages and to predict more types of languages, which await further explorations.
Conclusion

This book investigated nominal arguments and language variation. I focused on classifier languages and explored what is constant and what varies in the way classifier languages form nominal arguments.

In this book, I argued for the following four claims. First, bare numeral containing phrases (e.g. in the form of two books or two Cl book) have an identical D-less structure in classifier languages and number marking languages (possibly universally). Second, language variation in the nominal domain is due primarily to four factors: (i) what nouns denote, as kinds or as properties, and what lower function heads (i.e. Div and Cl) denote (a function from properties to properties or a function from kinds to properties), (ii) whether or not languages have the functional category D in their grammar \([\pm D]\), (iii) whether or not languages freely utilize covert argument formation operations (i.e. either a null D in the syntax or a covert type-shift in the semantics) \([\pm \text{ARG}_{\text{unrestricted}}]\), and (iv) whether the function head Div/Cl in bare numeral containing phrases is silent or not \([\pm \text{Div}_{\text{silent}}]/[\pm \text{Cl}_{\text{silent}}]\). Third, it is not necessary to assume a functional category D that is always invisible in classifier languages like Mandarin in order to account for the behavior of their nominal arguments. Fourth, article determiners, distinct from other members of the determiner family like that or this, in classifier languages are in fact expected, contrary to the standard view, but while they can combine with numeral-classifier phrases and numeral-less classifier phrases, they should not combine with bare nouns. My proposal is that bare nouns in classifier languages are always argumental regardless of whether or not there are determiners.

7.1 Overview of major claims

In Part I, I began with a detailed examination of the structure and the semantics of bare numeral classifier phrases in Mandarin, a well-studied classifier language which has no overt evidence of article determiners. I compared Mandarin with number marking languages like English, French and Hindi and showed that although bare numeral classifier phrases and bare numeral-noun phrases differ widely in their internal domain, they share high similarities at the clausal level, with the following common properties:
Basic generalization from number marking languages and classifier languages:

i. Bare numeral containing phrases are always both predicative and argumental.

ii. In their argumental role, they are always indefinites (with peculiar scope and island escaping behaviors).

iii. They can combine with a definite element/marker and then (and only then) they become definite.

iv. This is so regardless of whether a language is a number marking language or a classifier one and also regardless of whether or not a language has (overt) Ds.

I argued for an uniform D-less structure of bare numeral containing phrases in classifier languages and number marking languages, building on previous studies on numerals and numeral-noun phrases (e.g. Selkirk 1977, A. Li 1999, Haegeman and Guéron 1999; Winter 2001, 2005; Borer 2005; Ionin and Matushansky 2006; Di Sciullo 2012, Zhang 2013):

Uniform D-less structure of bare numeral containing phrases

\[
\text{DivP (ClP)} \rightarrow \text{NumP} \rightarrow \text{Div' (Cl')} \rightarrow \text{Div^0 (Cl)} \rightarrow \text{NP}
\]

In the structure in (2), numerals are phrasal in the syntax and are lexically ambiguous between a modifier and a modifier with a built-in choice function variable, and the canonical number morphology appears in the same position as classifiers. The proposed D-less analysis was shown to capture the remarkable cross-linguistic argumental behavior of bare numeral containing phrases in a straightforward way and also accounts for their long-distance scope ability. I further argued for a kind-referring analysis of Mandarin bare nouns, as proposed in Krifka (1995) and Chierchia (1998b); language variation in the nominal domain, under such an analysis, is primarily located in two interrelated factors: what nouns denote and what lower functional heads (i.e. canonical number morphology and classifiers) denote.

Building on this analysis of numeral classifier phrases, I reexamined Mandarin bare nouns and showed that the proposed analysis correctly predicts the scope behavior of bare nouns in Mandarin: as kind-denoting, they exhibit the narrowest scope ability like English bare nominals rather than English indefinites. The other interpretations of Mandarin bare nouns were shown to be derived from their kind references. The proposed analysis of Mandarin numeral classifier phrases further allowed us to examine and account for the numeral-less classifier phrases [Cl N] in Mandarin, which have rather restricted distributions but also exhibit the same long-distance scope behavior of bare numeral classifier phrases. I argued that Mandarin [Cl N] is the result of phonologically deleting one from [one Cl N] and has the full structure of the numeral classifier phrase, by adopting the one-deletion view as first argued in Lü (1944). In addition, the account developed in Chapter 2 also helped account for the interpretational restriction on nominal arguments in the sentence initial position in Mandarin. In the end of Chapter 2, we
reached the conclusion that it is not necessary to stipulate an empty functional category D in Mandarin in order to account for the syntactic and semantic properties of nominal arguments in this language.

The proposed analysis of Mandarin bare nominal arguments (i.e. bare numeral classifier phrases, bare classifier phrases, bare nouns) further allowed us to reexamine complex noun phrases containing -men, a morpheme that has been analyzed as a plural marker and/or a collective marker and has been shown to provide arguments for the existence of DP projections in Mandarin. I argued in Chapter 3 for the view that -men is a plural marker as first argued in A. Li (1999); however I argued against the analysis of placing -men in the D position or treating it as a definite determiner.

I showed that -men is compatible with numerals and classifiers, contrary to the traditional claim, and that -men should be located local to nouns and lower than numerals as well as classifiers. By treating -men as a plural morpheme, the Mandarin fact may seem to argue against the uniform D-less structure of bare numeral containing phrases proposed in Chapter 2, in which the classifier and the canonical number morphology such as -s/-es in English appear in the same functional head position (Div/Cl) (c.f. (2)). However, I argued that the Mandarin fact does not force us to give up the nominal structure in (2). Specifically, I proposed an analysis of -men as an associative plural marker and an associative plural projection closer to the noun and lower than the classifier, building on the split analysis of plurality (e.g. Witschko 2008; Kramer 2009, 2010, 2016; Dékány 2011; Butler 2012; Mathieu 2012, 2013, 2014; Mathieu and Zareikar 2015). The proposed analysis of -men together with the D-less analysis of bare nominals in Mandarin developed in Chapter 2 were shown to account for the properties of different types of phrases containing -men in a coherently principled manner.

The overarching goal of Part I was to argue for a D-less analysis of nominal arguments in Mandarin and a kind-referring analysis of Mandarin bare nouns. I showed that it is not necessary to stipulate a functional category D that is always invisible in Mandarin in order to account for the behaviors of nominal arguments in this language.

In Part II, I examined a typologically new kind of language, Nuosu Yi. I showed that Nuosu Yi exhibits the expected features of a classifier language. However, it also has an overt definite article which encodes presuppositions of familiarity, uniqueness and maximality and is virtually identical to definite determiners in Romance and Germanic languages. Also unusual is the fact that demonstratives do not combine directly with nouns in this language but require the mediation of classifiers.

These facts from Nuosu Yi were shown to essentially alter the landscape of the empirical data and challenge the claim that classifier languages do not have overt determiners (Chierchia 1998b; Boščović 2012a, 2014). Properties such as these were also shown to pose a challenge to accounts of argument formation developed in Part I. In particular, the discovery of a classifier language with an overt determiner may seem to tilt the balance in favor of the universal DP Hypothesis and also disprove the Chierchia's (1998b) Nominal Mapping Hypothesis adopted, since such a language contradicts Chierchia's speculation that classifier languages should not develop article determiners in their grammar given that nouns in classifier languages are names of kinds and can occur directly as arguments of verbs. However, I argued that the opposite is the case.

Specifically, I argued that despite the fact that Nuosu Yi has an overt definite determiner, this should not force us to change anything about the analysis of numerals,
classifiers and nouns advanced in Part I. I showed that a modification of Chierchia's (1998b) framework is needed, which can account for why classifier languages with overt Ds are possible but rare. The modified framework also allows us to make further predictions about classifier languages: (1) a classifier language with overt article Ds which disallow bare arguments (analogue of English/Italian/French) should not exist, and (2) if an overt article D should develop in a classifier language, it should only apply at higher nominal levels which are property-denoting (e.g. at the level of property-denoting numeral-classifier phrases) and not at the level of kind-referring bare nouns. If an intermediate projection between numeral-classifier phrases and bare nouns that is property denoting, namely a numeral-less ClP, is available, article Ds can apply at this level as well. The modified framework further permitted a novel conjecture, namely that the development of overt article Ds in classifier languages would only be allowed if they behave in the same way as the definite article in Nuosu Yi. It, of course, remains to be seen whether these predictions are borne out as classifier languages are investigated in further studies.

By the end of Chapter 4, we saw that the empirical adequacy of the proposed analysis of nominal arguments is substantiated by the fact that it can account not only for classifier languages without overt Ds but also for those that do have them.

In the last part of this book, I developed a uniform account of bare nominal arguments (i.e. bare numeral classifier phrases, bare classifier phrases, bare nouns) in classifier languages. I started with three points on which Mandarin and Nuosu Yi differ and which make this comparison interesting from the perspective of building a theory of cross-linguistic variation. Their differences were shown to mainly lie in the follow three aspects:

(3) Variation in classifier languages
   (i) whether or not they have the function category D in their grammar,
   (ii) whether or not they freely allow numeral-less classifier phrases to appear in argument positions, as a result of applying unrestrictedly covert argument forming operations (ARG) (e.g. either via a null D in the syntax or via a covert type-shift in the semantics), and
   (iii) whether or not they allow one-deletion from [one Cl N] in the PF.

I proposed three parameters to account for the variation: [±D, ±ARG_unrestricted, ±one-deletion]. These three parameters make predictions about eight types of classifier languages, most of which are indeed attested:
In addition to the three dimensions of variation in (4), I also examined the variation in expressing definiteness via bare nouns in classifier languages. Specifically, some classifier languages which freely employ numeral-less ClPs to express definiteness tend not to use bare nouns for definiteness (e.g., Cantonese, Bangla), a phenomenon which was accounted for via the Generalized Blocking Principle (c.f. Chapter 5, Section 5.4).

Finally, in Chapter 6 I discussed the relationship between argument formation in classifier languages and argument formation more generally. I began with a discussion on the variable properties and uniform properties concerning nominal arguments in number marking languages (e.g. English, French, Italian, and Hindi) and showed that their variation can be captured by two of the parameters in classifier languages: \([-\text{D}]\) and \([\pm \text{ARG}_{\text{unrestricted}}]\) (c.f. (4)). I further showed that the variation in nouns regarding what they are coded, as kinds \([\pm \text{arg}, -\text{pred}]\) or as properties \([-\text{arg}, +\text{pred}]\), can differentiate classifier languages from number marking languages. With these three major dimensions of variation, we updated the variation and typology of nominal argument formation:
I further discussed Yudja and Lhasa Tibetan, both of which have neither a general classifier system nor obligatory singular/plural marking on nouns. I showed a parallel between Lhasa Tibetan and number marking languages and a parallel between Yudja and classifier languages in the nominal domain. Building on Lima (2010, 2012, 2014), Zhang (2013), and Chierchia (2014), I treated Yudja as a language in which nouns denote kinds and which has a silent Cl and Lhasa Tibetan a language which has a silent Div and freely allows covert argument forming operations on its bare nouns. The discussion on Yudja and Lhasa Tibetan led us to another dimension of variation of nominal arguments, i.e. languages differ in whether the function head Div/Cl in bare numeral containing phrases is silent or not \([\pm \text{Div}_{\text{silent}}]/[\pm \text{Cl}_{\text{silent}}]\). This dimension of variation, together with the three major dimensions of variation discussed earlier (i.e. \([\pm \text{arg}, \pm \text{pred}], [\pm \text{D}], [\pm \text{ARG}_{\text{unrestricted}}]\)) (c.f. (5)) allowed us to further update the variation and typology of nominal argument formation across languages and to predict more types of languages, which await further explorations:
7.2 Directions for future research

Although the analysis of Mandarin and Nuosu Yi appeared applicable to the wider range of classifier languages examined in Chapter 5, more detailed investigation into these and other classifier languages requires further work. Below I will point out the limitations of this work and some revenues for further research.
First, in this book I only focused on bare numeral containing phrases (such as *two workers* and *three Cl student*) and their island-escaping and long-distance scope behaviors across languages. I provided no discussion on phrases that contain modified numerals (such as *exactly two workers*, *about four students*, and *at least three students*) or other amount expressions (like *many students* and *few workers*). Different from simple, unmodified numeral containing phrases, phrases that contain modified numerals of the above sort seem to lack the long-distance scope and island escaping behaviors (at least in English) (see Kamp and Reyle 1993; Beghelli 1995; Beghelli and Stowell 1997; Szabolcsi 1997, 2010; Winter 2001, 2005, a.o.). Such facts challenge the choice functional analysis of bare numerals adopted in this book, if we treat bare, unmodified numerals and modified numerals alike syntactically and semantically. Investigations into phrases containing more complex numerals in both number marking languages and classifier languages will be needed in order to have a better understanding of numeral containing phrases across languages.

Second, regarding my discussions on phrases without numerals, I also only examined bare nominals (i.e. bare nouns and bare classifier phrases) and their variation across languages, and investigations into modified nominals, such as relative clause modified nominals and adjective modified nominals, are lacking from the current work. Specifically, bare nominals and modified, complex nominals seem to be parallel in some classifier languages but not in some others. Take Cantonese, Nuosu Yi, and Thai as examples. Bare classifier phrases in Nuosu Yi are freely argumental and receive an indefinite interpretation (7a) (c.f. Chapter 4); relative clause modified classifier phrases in this language can also freely serve as arguments with an indefinite reading (7b) (e.g. Jiang and Hu 2010a, 2015). In Cantonese, bare classifier phrases are freely argumental with a definite reading (8a) (e.g. Cheng and Sybesma 1999, c.f. Chapter 5); its relative clause modified classifier phrases are also freely argumental with a definite interpretation (8b) (e.g. Matthews and Yip 1994, 2013). In contrast, the bare classifier phrase is banned in Thai (9a), but when this phrase is modified by relative clauses, it becomes acceptable and can occur in argument position (9b) (see Jenks 2011).

(7)    a. vo  ma
      pig  Cl
      'a pig'

      b. vo Mary  ho ta ma John  ku  si dzu ox.
      pig  Mary  feed  result  Cl  John  Agent  kill  eat  SFP
      'John killed a pig that Mary fed.' (Jiang and Hu 2015)

(8)    a. bzek gau zungji sek juk.
      Cl  dog  like  eat  meat
      'The dog likes to eat meat.' (Cheng and Sybesma 1999)

    b. Ngôh yiū  wán  go  yàhn  m̀h háidouh.
      I  need  seek  Cl  person  not  here
      'The person I’m looking for is not here.' (Matthews and Yip 1994)

(9)    a. *thúrian  lùuk
      durian  Cl

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The facts above raise questions regarding what is constant and what varies in the way classifier languages form complex nominal arguments.

Third, although I have examined eight types of classifier languages, captured by the three parameters proposed in Chapter 5, we should expand the research on nominal arguments to even wider languages, especially to the understudied ones. The purpose is to bring sophisticated analyses of nominal arguments in more languages to bear upon important issues in the theory of argument formation.

The study of more classifier languages with different nominal systems may lead to an essential reorganization of the current picture. For the time being, however, studying Mandarin and Nuosu Yi comparatively has perhaps brought us a few steps closer to a general theory of argument formation.
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