Mandarin associative plural *-men* and NPs with *-men*

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Abstract: This paper discusses the syntax and semantics of *-men* and four types of phrases containing *-men* in Mandarin. I defend the view that *-men* should be analyzed as a plural morpheme as first argued in Li (1999) but argue against the analysis of positing *-men* in the D position or treating it as a definite determiner. It will be shown that definiteness is not inherent to *-men* and that *-men* is compatible with numerals and classifiers and should be in a position local to nouns. I propose an analysis of *-men* as an associative plural and explain the properties of the four types of expressions containing *-men* within a Neo-Carlsonian account of bare nominals. The formal account of the syntax and semantics of phrases containing *-men* advanced in this paper shows 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 its nominal arguments and argues for the lack of DP projections in Mandarin.

Keywords: Mandarin, *-men*, plurality, numerals, classifiers, kind terms, (in)definiteness

1. Introduction

Mandarin does not mark the singular-plural distinction on nouns but does have an expression that conveys reference to pluralities: *-men*. This expression has received a lot of attention and discussions, and some well-known generalizations include: nouns with *-men* are always definite, *-men* cannot co-occur with numeral-classifier quantity expression in post-classifier position, and *-men* differs from plural markers like -s/-*es* in English in that it has a peculiar use 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’. This paper investigates *-men* and examines the syntactic and semantic properties of four types of phrases containing *-men*. I will show that definiteness is not inherent to *-men* and that *-men* can appear in the post-classifier position in two types of phrases less discussed in the literature. It will also be shown 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. I propose an analysis of *-men* of associative plural and provide a formal account of the syntax and semantics of the four types of phrases containing *-men* within a Neo-Carlsonian account of bare nominals and argue for a D-*less* analysis of nominal arguments in Mandarin.

This paper is organized as follows. Section 2 reviews three main views of *-men* that have been proposed in the literature. This paper supports the view that *-men* should be treated as a plural marker as first argued in Li (1999); however empirical evidence will be provided to argue against the analysis of positing *-men* in the D position or treating it as a definite determiner. It will be shown that definiteness is not inherent to *-men* and that *-men* should be located local to nouns and lower than numerals and classifiers. In the end of this section, two less commonly addressed properties of phrases containing *-men* will be discussed. Section 3 proposes an analysis of *-men* as an associative plural and explains the properties of phrases containing *-men* within a Neo-Carlsonian account of bare nominals. It will be shown the properties of all types of phrases containing *-men* examined in Section 2 are amenable well-established principles of meanings. The proposed formal account of the syntax and semantics of phrases containing *-men* argues for a D-*less* analysis of nominal arguments in Mandarin. Section 4 discusses why a Neo-

Carlsonian approach is better to handle Mandarin and classifier languages in general and provides further arguments for the view that the D projection is not universal. Finally, two remaining issues regarding NPs with *-men* are discussed but explanations are left for the future. Section 5 concludes the paper.

2. Previous analyses, challenges and additional properties of *-men*

2.1 Previous analyses of *-men*

Mandarin has a plural-like morpheme *-men* which is used with pronouns or human nouns to express plurality (Lü 1947; Chao 1968; Norman 1988; Iljic 1994; Li 1999, a.o.) (1). If non-human animate nouns are humanized, usually with affection, they can take the plural morpheme ; inanimate nouns usually cannot take the morpheme *-men* (Lü 1947) (2).

(1) a. *ni*
2-sg
'you (sg)'
b. *xuesheng*
student
'the student(s)/students'

a'. *ni-men*
2sg-MEN
'you (pl)'
b'. *xuesheng-men*
student-MEN
'the students'

(2) a. *xiao-niao*
little-bird
'a/the/some bird/birds'
b. *pingguo*
apple
'the apple(s)/apples'

a'. *xiao-niao-men*
little-bird-MEN
'the birds'
b'.**pinguo-men*
apple-men

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.[1]

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 (3), the existential sentence allows bare nouns but not NP-men.

(3) a.**you ren-men*
have person-MEN

b. *you ren*
have person
'there is/are some person(s)' (Iljic 1994)

[1] According to Chao (1968) and Norman (1988), *-men* is a plural morpheme when it is attached to pronouns but a collective maker when it is attached to common nouns. Cheung (2003) and M. Hsieh (2008), on other hand, hold the view that *-men* is a collective maker when using with pronouns and proper names but a plural marker when using with common nouns.

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) (4). Three, *-men* cannot co-occur with numeral-classifier quantity expressions (Lü 1947; Chao 1968; Norman 1988) (5).

(4) *Zhangsan-men zai nali?*
Zhangsan-MEN at where
'Where is Zhangsan and the others?'

(5) **san-ge xuesheng-men*
three-Cl student-MEN
'three student+*men*' (Iljic 1994)

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 Li (1999) and further defended by others (e.g. Kurafuji 2004; H. Yang 2005; Bošković and Hsieh 2012; Jiang 2012). Below I will focus on reviewing arguments from Li (1999) and two representative analyses, Li (1999) and Kurafuji (2004).

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 (1b).

Two, the *-men* suffixed proper name, in addition to receiving a 'group' interpretation (6i), can also refer to a plural individual with the same characteristics or the same name of the person expressed by the proper name (6ii).

(6) *XiaoQiang-men*
XiaoQiang-MEN
i. 'XiaoQiang and the others'
ii. 'People with the characteristics or the same name of *XiaoQiang*.'

According to Li, this additional interpretation in (6ii) 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 *dou*, as shown in (7), raises questions for the 'collective' status of *-men* as argued in Iljic (1994).

(7) *xuesheng-men dou li-kai le.*
student-MEN DOU leave ASP
'Each of the students has left.' (Li 1999)

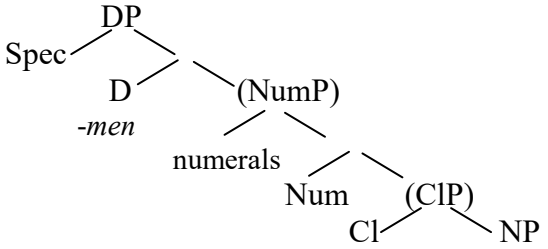
Four, *-men* is not completely incompatible with numeral-classifiers. Although it is true that *-men* marked nominal expressions cannot appear in the position following numeral-classifier (5), they can appear in the position preceding numeral-classifiers(-noun) when the nominal expression is a pronoun or a proper name (8a, b). Common nouns and *-men*, on the other hand, are still

incompatible with numeral-classifiers (8c). Li further notices that the sentence in (8b) 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 (8bii).

(8) 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.' (Li 1999)

Based on the facts in (5) - (8), 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 (Li 1999: 91). Structurally, *-men* is generated in the head position of NumP but is realized on an element in head position of DP (10).

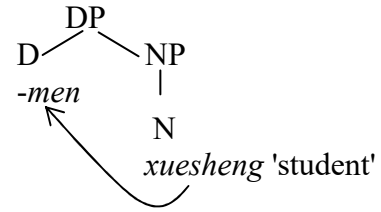
(9) Definite expressions: DP



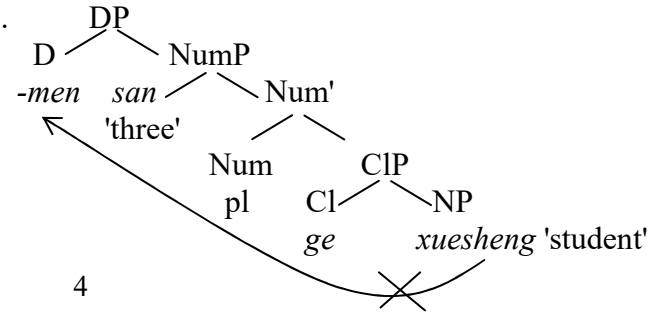
In Li (1999), definiteness is assumed to be obtained when the D head position is filled with an overt element, along the same lines as Longobardi (1994). Li assumes that common nouns are base-generated in the head of NP and that proper names are generated in the head of DP in Mandarin. When classifiers and numerals are absent, common nouns can move to the D position to pick up the plural morpheme *-men*, accounting for (1b'), as illustrated in (10a).

(10) Li's (1999) analysis of definite DP

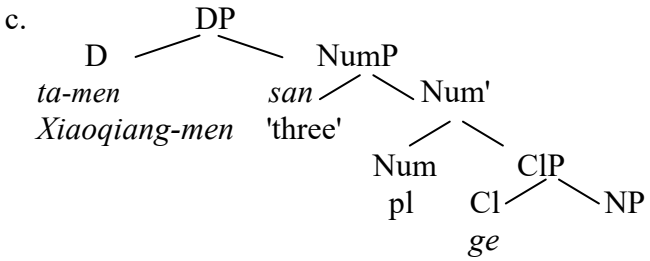
a.



b.



c.



In (10b), 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 (5) and (8c). On the contrary, in (10c) 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 (8a, b).

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 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 (10a) has the semantics below.

(11) a. [[xuesheng]] = STUDENT <e>
b. [[xuesheng]] = $^{\cup}$STUDENT <e, t>
c. [[men]] = $\lambda P_i[\sigma x[PL(P_i)(x)]]$ <<e, t>, e>>
d. [[xuesheng-men]] = $\sigma x[PL(^{\cup}STUDENT)(x)$ <e> (Kurafuji 2004)

Following Chierchia (1998), Kurafuji assumes that bare nouns in classifier languages are kind-referring, type <e> (11a) and that the up-operator '$^{\cup}$' can shift kinds to properties (11b). In (11c), *-men* functions as plural marker as well as a definite determiner (11d). Specifically, PL is the pluralization function as in Chierchia (1998), 'P_i' 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 (11d), *-men* turns the property-denoting noun *xuesheng* 'student' into a plural individual with a definite interpretation.

Differing from Li (1999), Kurafuji provides a semantic type-theoretic explanation for the ungrammaticality of the phrase in (5) **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 (6) has a different semantics from the proposed one in (11).

This paper defends the third view that *-men* is a plural morpheme as first argued by 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 sub-section, I discuss empirical evidence that challenge such a DP analysis of *-men*.

2.2 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 Ns.

2.2.1 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* 'pile, crowd' (e.g. Hsieh 2008; Jiang 2012). It is true that classifiers like *ge* do not allow *–men* to appear in the numeral-classifier-noun phrase as shown in (5), but the classifiers examined in previous work are all individual classifiers (these are "individual measures" in Chao 1968 and "count classifiers" in Cheng and Sybesma 1999). [2] If we replace individual classifiers with group classifiers, *-men* is allowed to appear in the [Numeral-Classifier-Noun] phrase, as illustrated below.

(12) a. *Ta zai gen yi qun haizi-men wan.*
he in with one CL child-MEN play
'He is playing with a group of children.' (Hsieh 2008)

b. *zhe (yi) qun haizi-men qu na-er le?*[3]
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 xuesheng-men de biao-xian dou bu cuo.*
I think this two $Cl_{team/group}$ student-MEN De behave all not bad
'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.*
this four $Cl_{team/group}$ contestant-MEN look all confidence full-full De
'These four groups contestants all look very confident.' (Jiang 2012)

As we saw in Section 2.1, the ungrammaticality of the phrase **san ge xuesheng-men* 'three Cl student-men' in (5), according to 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* (10b). Then one may wonder why the occurrence of the classifiers in (12) do not prevent common nouns from moving to the D position to combine with *-men*. Kurafuji (2004), on the other hand, attributes the ungrammaticality in (5) to the semantic type of the *-men* phrase (as type <e>)

[2] In Chao (1968: 584-620), measures in Mandarin are divided into nine kinds; five out of the nine kinds are measures for counting nouns, and four out of the nine kinds are not . The five kinds of measures for counting nouns are: (i) individual measures (*e.g. yi ge ren* 'one person', *yi zhi bi* 'one pen'); (ii) container measures (e.g. *yi wan yingtao* 'one bowl of cherry'; *yi bei shui* 'one glass of water'); (iii) standard measures (e.g. *yi gongjin yingtao* 'one kilo of cherries'; *yi bang rou* 'one pound of meat'); (iv) group measures (e.g. *yi qun haizi* 'a group of children'; *yi dui sha* 'a pile of sands'); (v) partitive measures (e.g. *yi ceng dangao* 'one layer of cakes'; *yi xie haizi* 'some children'). Cheng and Sybesma (1999) divides classifiers into two major kinds, i.e. (i) count-classifiers, such as *ge, zhi*, which combine only with conceptually count nouns, and (ii) mass-classifiers, such as *wan* 'bowl', *gongjin* 'kilo', which can combine with conceptually mass nouns as well as count nouns.

[3] The numeral 'one' *yi* is optional in this sentence. The optional numeral 'one' *yi* has been argued to be a case of omission (from [one Cl-N]) (see Lü 1944; Chao 1968; Li 1997; Jiang 2012, 2015; Li and Feng 2015; Huang 2014).

which is not the correct semantic type that classifiers are looking for. Similarly, one may also wonder why the *-men* phrases in (12) allows the classifiers to combine with them.

If we examine closer, we can notice that the examples in (12) 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:

(13) a. *two groups of the kids
b. *a crowd of the kids
c. *two teams of the students

Two, we can posit the existence of phrases containing NP-*men* but cannot do so with definite plurals in English:

(14) *qiao, you you yi qun haizi-men lai yao tang le.*
Look, again exist one Cl_{group} child-MEN come ask-for candy Asp
'Look, there is a crowd of kids coming to ask for candies again.'

(15) Look, *there is a crowd of the kids coming to ask for candies again.'

These differences above show that NP-*men* is not the equivalence of the definite plural DP in English. More importantly, the examples in (12) and (14) suggest that *-men* is *not* inherently definite, otherwise we should expect appearance of *-men* in these examples to be banned.

Besides common nouns, proper names also can appear in the [Num CL_{group} Noun] phrase:

(16) a. *zhe liang zu xiaozhang-men de biao-xian dou bu cuo*
this two team principal-MEN De behave all not bad
'The performances of these two teams of principals are all very good.'
b. *zhe yi qun XiaoQiang-men dou tai wangu le.*
this one group XiaoQiang-MEN all too stubborn Asp .
'This group of people with the same name of XiaoQiang are all too stubborn.'

In contrast with the example *XiaoQiang-men* in (6) which receives both a 'pure plural' reading and an associative reading, the examples in (16) only receive a 'pure plural' reading, and the associative reading is unavailable.

As shown in (10c), Li (1999) posits proper name in the D position, above numeral-classifiers (10c). Although such an analysis explains why [Proper Name + *men*] can appear in a position preceding the numeral-classifier (8b), it remains puzzling why it can also appear in a position lower than the numeral and the group classifier in (16). What the facts in (12), (13) and (16) suggest is that *-men* should be in a position local to both common nouns and proper names rather than in a position above them as well as the numeral and the classifier.[4]

[4] Another piece of evidence that shows that proper names can appear in a position lower than numeral-classifiers comes from the example below, in which *Zhangsan* follows the individual classifier.
(1) *zhe (yi) ge Zhangsan qu na qu le?*
Dem one $Cl_{individual}$ Zhangsan go where go Asp
'Where did (this person) Zhangsan go?'

Unlike common nouns and proper names, pronouns and *-men* cannot appear in the position following the classifier regardless of whether it is an individual classifier (17a) or a group classifier (17b).

(17) a. * *liang ge ni-men*
two $CL_{individual}$ 2sg-MEN
b. * *liang qun ni-men*
two CL_{group} 2sg-MEN

The behavior of pronouns in Mandarin above is similar to that in the English, i.e. English pronouns also cannot be counted by numerals (e.g. **two you*, **two groups of you*).

This subsection showed that *-men* is compatible with numeral-classifier quantity expressions when the classifier is a group classifier. The examples given in (12), (13), and (16)) 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 common nouns and proper names. Next, I will move on to the second challenge for the DP analysis of *-men*.

2.2.2 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 (5)/(10b) (as repeated in (18a)); however, as noted in Hsieh (2008), in some examples, *-men* is allowed in the post-classifier position (18b). In addition to Hsieh's examples, I provide further examples found in Beijing Language and Culture University DCC Corpus (BLCU Corpus in short) in (19).

(18) a. **san-ge xuesheng-men*
three-Cl student-MEN
'three student+*men*'
b. ...*sanbai duo wei laoshi ji juanshu-men posuoqiwu...*
three:hundred more CL teacher and family:dependant-MEN beautifully:dance
'…more than three hundred teachers and their family dependants danced beautifully…' (Academia Sinica Corpus, Hsieh 2008)

(19) a. *zai shi ji ge tongxue-men de qianhuhouyong xia,*
at ten a-few/how many 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/which 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/how-many 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 illustrate that the presence of the individual classifier *ge* is not a factor that prevents the common nouns from combing with *-men* as suggested in (10b). 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* 'which/many'. *Shi-ji* 'ten-ji' in (19a) ranges from 11 to 19; *qishi-duo* 'seventy-duo' in (19b) ranges from 71 to 79; *ji-bai* 'ji-hundred' in (19c) ranges from 100 to 900. Morphemes like *ji* 'how many/(number)/a few' and *duo* 'which/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). 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.[5]

Note that, the numeral approximation phrase containing N-*men* in (19) exhibits differences from the phrase without *-men*. First, existential sentences allow the latter not the former:

(20) 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

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:

(21) a. *wo kanjian shi-ji ge xuesheng zhengzai lianxi jijian.*
1sg see ten-a few Cl student Prog practice fencing
'I saw 10 plus x students practicing fencing.'
b. *wo kanjian shi-ji ge xuesheng-men zhengzai lianxi jijian.*
1sg see ten-a few Cl student-MEN Prog practice fencing
'I saw the 10 plus x students practicing fencing.'

[5] I name this construction after Anderson (2015) who refers to English phrases like *seventy-some*, *twenty-some* as 'Numerical Approximation using *some*'.

The sentence in (21a) implies existence of other students besides those who were practicing fencing. Instead, (22b) implies that all students in the context were included and that they were practicing fencing.

In the rest of this subsection, I will provide a description the syntactic and semantic properties of numeral approximation using *ji*/*duo*, which will help us understand the structure and semantics of the [Num-Approximation Cl N-men] phrase later in Section 3.5.

Numeral approximation construction containing *ji*/duo has two syntactic properties. One, the particular quantitative determinative may appear in different position. *Ji* 'a few/how many' can either follow or precede the numeral, as in (22a) and (22b), whereas *duo* 'many/which' cannot precede the numeral (22a') but only follow it (22b').

(22) a. *ji bai*
a few hundred
'a few hundreds'

a'. **duo bai*
many hundred

b. *ershi ji*
twenty a few
'twenty-some'

b'. *ershi duo*
twenty many
twenty-some

Two, the particular numeral being modified determines whether *ji*/*duo* is allowed. Specifically, ten and multiples of ten (e.g. 20, 30, 100, 160, 1000) allows the occurrence of *duo*; as for *ji*, round numbers lower than one hundred (i.e. ten to ninety) allow *ji* to appear in the post-numeral position, and ten and powers of ten (e.g. 100, 1000, 1000) allow it to appear in the pre-numeral position.

(23) a. **wu duo*
five many

b. *shi duo*
ten many
'ten plus x'

c. *yi-bai duo*
one-hundred many
'one hundred-some'

d. *yiqian duo*
one-thousand many
'one thousand-some'

(24) a. **wu ji*
five a few

b. *shi ji*
ten a few
'ten plus x'

c. **yi-bai ji*
one-hundred a few

d.* *yi-qian-ji*
one-thousand-many

b'. **ji wu*
a few five

b'. *ji shi*
a few ten
'x multiple 10'

c'. *ji bai*
a few hundred
'a few hundred'

d'. *ji qian*
a few thousand
'a few thousand'

Numeral approximation using *ji*/*duo* has three semantic properties. First, the position of *ji*/*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 (19a)/(22b) and multiplicatively (19c)/(22a); *duo* 'many/which' can only be used additively, as in (19b)/(22a', b').

Second, this phrase denotes a range of number (Chao 1968; 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 (25a), but in fact *Linguistics 101* this course has 19 students; in this case, (25a) is naturally thought of as being false; similarly, if

Linguistics 101 in fact has 33 students, (25a) is also thought of as being false. However, if in a situation, *Linguistics* has 23 students, (25a) would be judged true.[6]

(25) 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:

(26) 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.'

This subsection showed that *-men* is compatible with numeral-classifier expressions even when the classifier is a individual classifier (19); however the numeral needs to express approximation with a lower and upper bound. This fact further showed that the presence of the individual classifier *ge* is not a factor that prevents common nouns from combing with *-men* as suggested in (10b). I also illustrated that the [Num-Approximation Cl N-*men*] phrase differs from the phrase without *-men* (21) and examined the syntactic and semantic properties of numeral approximation using *ji*/*duo*. In the next subsection, I will present the third challenge for the DP analysis of *-men*.

2.2.3 *-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 (8c) in which common nouns are disallowed to combine with *-men* to appear in the position preceding numeral-classifiers (as repeated in (27)). 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 (28).

(27) **wo qing pengyou-men san-ge (ren) chifan.*
I invite friend-MEN three-Cl person eat
'I invited three friends for a meal.'

(28) a. Context: in a family in which there are three kids; the mother said to the father:

[6] 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 paper, I will set aside this difference and assume that *ji* and *duo* are the same in the semantics for now.

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) jieji- 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 (28) 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 discuss these properties in Section 2.3.1.

2.3 Two less addressed properties of phrases containing *-men*

The purpose of this subsection 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.

2.3.1 [N-men Num Cl]: its appositive nature

Iljic (1994: 93-94) and Li (1999: 95, ft.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; Li 1998, Cheng and Sybesma 1999; Chierchia 1998; 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 (Li 1999). This applies to pronouns, proper names and common nouns, as illustrated below.

(29) 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 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.' (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.'

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*: [7]

(30) 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.' (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 2. Three examples are repeated below.

(31) 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 haizi(-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.'

[7] One exception to this generalization is the case in which the numeral is *one* and the classifier is an individual classifier:
(1) a. *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.'
b. *ta(*-men) yi ge ren juran chi-le liu wan fan.*
3sg MEN one Cl person unexpectedly eat-Perf six bowl rice
'He, one person, unexpectedly ate six bowls of rice.'
c. *haizi(*-men) yi ge ren juran chi-le liu wan fan.*
kid MEN one Cl person unexpectedly eat-Perf six bowl rice
'The kid, one person, unexpectedly ate six bowls of rice.'
In the above examples, *-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*.

Third, N-*men* and the numeral-classifier can undergo movement to the topic position or the post-*ba* position (a case position argued for in Huang et al 2009). Examples are given below.

(32) 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 fo 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 (33) and (34); we can posit the existence of the [Num Cl N] phrases (33) but cannot do so with the [N-*men* Num Cl] phrases (34).

(33) *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.'

(34) 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 (33), 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 (34) 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 (34) 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 (34c) 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.

(35) 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 (35a), 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 (35b) 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 (35a) but infelicitous to utter the one in (35b).[8]

Next, let us move on to the N-*men* phrase and its additional property.

2.3.2 N-*men*: its generic reading

This subsection discusses a 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 (Rygaloff 1973; Yorifuji 1976, c.f. Iljic 1994: 94); the following two examples have been used to illustrate this point:

(36) 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)

The above two examples cannot illustrate the point that the [Common Noun + *men*] phrase can never receive a generic interpretation. First, the example in (36a) only shows that the [Common Noun + *men*] phrase cannot be used as a predicate. Second, the example in (36b) 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 disallows an argument containing *-men*:

(37) a. *baiwanfuweng(-*men) yijing hen pubian le.*
millionaire-MEN already very common Asp
'Millionaires are very common now.'
b. *hao nanren(*/??-men) yijing 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), as exemplified below.

[8] Note that, the two underlined phrases in (35) are not minimal pair; as mentioned before, *san ge haizi-men* 'three kid-men' is not a grammatical phrase (5) below, and *haizi san ge* 'kid three Cl' is not a grammatical phrase either (30). Consequently, the phrases in (35) are the only two grammatical ones that can be used for comparison.

(38) 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
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)

The sentences in (38) 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.

2.4 Section Summary

To summarize Section 2, 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 Li (1999); however I do not agree with 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 quantity expressions when the classifier is a group classifier [Num Cl_{group} N-*men*] (12)/(14)/(16); such a fact showed that the [N *-men*] phrase is not the equivalence of definite plurals in English and that *-men* should be in a position lower than the numeral classifier and local to nouns. Second, *-men* is compatible with numeral-classifier quantity expressions even when the classifier is a individual classifier; however the numeral needs express approximation with a lower and upper bound (19). The [Num-Approximation Cl N-*men*] phrase showed that the presence of the individual classifier *ge* is not a factor that prevents the common nouns from combing with *-men*. Third, common nouns are not completely banned in the position preceding the numeral-classifier. 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 non-restrictive [N-*men* Num Cl] phrase differs greatly from the

restrictive [Num Cl N] phrase 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 Li (1999) and Kurafuji (2004), I will, in the next section, defend their view that *-men* is a plural morpheme and propose that *-men* is an associative plural. It will be shown that the proposed analysis of *-men* together with well established principles of meanings can explain in a principled manner the syntactic and semantic properties of the four types of phrases containing *-men*: (i) N-*men*, (ii) [Num Cl_{group} N-*men*], (iii) [Num-Approximation Cl N-*men*] and (iv) [N-*men* Num Cl (person)] discussed in this section.

3. *Men* as an associative plural marker

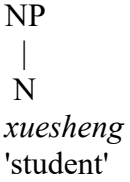
In this section, I propose an alternative analysis of *-men* and explain the properties of phrases containing *-men* within a Neo-Carlsonian account of bare nominals. The system that I adopt includes a set of ranked type-shifting operations, which will be introduced first in Section 3.1. The goal here is to derive the structural and semantic properties of phrases containing *-men* a coherently principled manner. Justifications for the choice made here over other possibilities will be presented in Section 4.

3.1 Theoretical background: the Neo-Carlsonian account of bare nominals

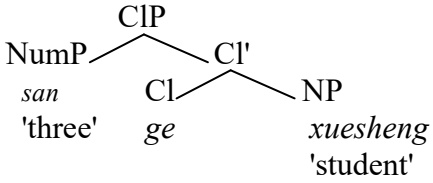
I adopt the view that that all bare nominals denote kinds and that their object level meanings are derived from their basic kind level meaning (Carlson 1977, 1989; Chierchia 1998; Dayal 2004, 2011, 2012). This is consistent with the view, going back to Krifka (1995) that bare nominals in classifier languages denote kinds and that classifiers serve to shift the denotation from kinds to objects/sets and to relate kinds to numerals.

According to this view, bare nouns and numeral classifier phrases in Mandarin are analyzed as follows. Syntactically, bare nouns in Mandarin project an NP instead of a DP (39a), given that bare nouns are argumental (i.e. kind-referring), rendering a D head unnecessary (see Yang 2001; X. Li 2011, Jiang 2012).[9] The structure of numeral classifier phrases in (39b) is based on the analysis proposed in Li (1997, 1999) and Cheng and Sybesma (1999), in which the numeral is phrasal appearing in the specifier position, and the classifier is the head taking an NP as its complement.

(39) a.



b.



The semantics of the bare noun and the numeral classifier phrase in (39), based on Krifka (1995), Chierchia (1998, 2008), Jiang (2012) and Dayal (2014), is given below:

[9] Note that an NP analysis of bare nouns in Mandarin has been proposed in Li (1999); in her work, indefinite bare nouns in Mandarin are treated as NPs, and definite bare nouns are treated as DPs. Section 4 will provide a brief review of the debate between NP and DP and present the reason why this paper pursues the NP analysis bare nouns in Mandarin instead of the DP analysis.

(40) a. [[xuesheng]] = STUDENT <e^k>
b. [[ge]] = λkλnλx [n(AT([$\cup$k(x)))]) <e^k, <n, e>>
c. [[san]] = λP[$f_{\exists}$three(P)] <<e, t>, e>
d. [[san ge xuesheng]] = $f_{\exists}$ (λx[three(AT(STUDENT))(x)]) <e>

In (40a), the bare noun *xuesheng* 'student' denotes kind, type <e^k> (Krifka 1995; Chierchia 1998).[10] The individual classifier *ge* in (40b) shifts kinds to a set of atomic instantiations of the kind and relate this set to the numeral (e.g. Krifka 1995; Jiang 2012; Dayal 2014). *AT* can be understood as a relation between numerals and atomized noun denotations (Chierchia 2008; Jiang 2012). In (40c), the bare numeral *san* 'three' is treated as a indefinite determiner of type <<e, t>, e>, which contains a choice function variable '$f_{\exists}$', subject to existential closure at arbitrarily chosen scope site, along the lines proposed in Winter (1997). The numeral classifier phrase in (40d) then ends up with being an argument with an indefinite interpretation, type <e> (Jiang 2012; Dayal 2014).

Below I give the specific version of the Neo-Carlsonian approach adopted in this paper, due to Chierchia (1998), with the specific modification of *Rank of Meaning* from Dayal (2004).

(41) Chierchia's (1998) type-shifting operations:
a. Predicativize: $\cup$k = λx [x≤ k_s], if k_s is defined, else undefined. <s,e>→<e,t>
b. Nominalize: $\cap$P = λs ι P_s, if λs ι P_s is in K, else undefined. <s, <e,t>>→<s,e>>
c. Iota: ιX = the largest member of X if there is one, else, undefined. <e, t>→<e>
d. Existential closure: ∃X=λP∃y[X(y)∧P(y)] <e, t> → <<e,t>, <<e,t>,t>>)

(42) a. *Ranking of Meaning*:
(i) $\cap$ > {ι, ∃}; (ii) {$\cap$, ι} > ∃ (revised by Dayal (2004))
b. *Blocking Principle* ('Type Shifting as Last Resort')
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)

In (41a), the 'up'-operator $\cup$ predicativizes kinds and maps kinds to properties; the 'down'-operator $\cap$ in (41b) nominalizes, mapping those properties that correspond to kinds to their kind individuals. These two type-shifting operations serve as universal mechanisms to get from one to the other. Importantly, plural properties can be turned to 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 1998). In (41c, d), 'ι' and '∃' shift properties to arguments with a definite and an indefinite interpretation respectively.[11]

[10] Other interpretations of bare nouns in Mandarin (i.e. definite, non-specific indefinite, generic) can be derived from the kind term in a principled manner; I refer the readers to Chierchia (1998), Dayal (2004, 2012) and Jiang (2012) for details.

[11] A crucial point for the neo-Carlsonian view is the difference between the indefinite readings of bare plurals and ordinary indefinites. The first allows only narrow scope indefinite readings, while the latter participates in scope interaction:

(1) a. Miles wants to meet policemen. want > ∃/*∃ > want
b. Miles wants to meet a policemen. want > ∃/∃ > want (Carlson 1977)

Next, I will briefly discuss the reason for the ranking in (42a). In Chierchia (1998), '$\cap$' ranks over 'ι' and '∃' (42ai); this ranking is motivated by the fact that (English) plurals generally favor the kind interpretation over the indefinite one (43a). Chierchia claims that '∃' comes into the picture when '$\cap$' is undefined (43b, c).

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

A further explanation is that '$\cap$' only changes the type of its arguments without changing the information associated with it, but '∃' introduces quantificational force in addition to changing the type of its arguments. Kind formation '$\cap$', therefore, is more meaning preserving than '∃' and should get picked whenever possible. Dayal (2004), however, notes that Chierchia's ranking in (42ai) 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 '∃' should apply to 'ι' as it also merely changes the type of its arguments without adding quantificational force and should also rank over '∃'. The revised ranking (42aii) is required to explain the fact that bare nominals can denote kinds as well as being contextually salient entities in languages without definite determiners. That is, definite readings are never blocked by kind formation in languages without definite determiners. Ranking '∃' below 'ι is based on her claim that bare nouns in such languages are not bona fide indefinites:

(44) a. *mujhi lagtaa hai ki kamre meN cuuha ghuum rahaa hai.* (Hindi)
to-me seems that room in mouse moving around is
'It seems to me that a mouse is moving around in the room.' *seem* > ∃/*∃ > *seem*
b. *Wo xiang waimian gou keneng zai-jiao.* (Mandarin)
I think outside dog probably be-barking
'I think dogs are probably barking outside.' *think* > ∃/*∃ > *think* (Dayal 2004)

The last piece of the theory that will be relevant to us is the Blocking Principle (42b) 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:

(45) 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, I now move on to the alternative analysis of *-men* to be proposed in Section 3.2.

3.2 Mandarin *-men* as an associative plural

Among the properties of *-men*, as we saw in Section 2, 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 (6). 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 *-tachi* in Japanese (Moravcsik 2003; Nakanishi and Tomioka 2004), *-ra* in Bangala (Dayal 2012, 2014; Biswas 2014), *-ék* in Hungarian (Moravcsik 1994, 2003; Corbett 2000) and *-hulle* in Afrikaans (den Besten 1996), as illustrated below:

(46) a. *Taro-tachi* (Japanese)
Taro-TACHI
'the group of people represented by Taro' (Nakanishi and Tomioka 2004)
b. *Ghosh-ra* (Bangla)
Ghosh-RA
'a set of individuals that includes Ghosh' (Dayal 2014)
c. *Jan-hulle* (Afrikaans)
John-HULLE
lit: 'John and his folks'
'the group surrounding and include John' (den Besten 1996)
d. *Péter-ék* (Hungarian)
Peter-EK
'Peter and his family or friends or associates' (Moravcsik 2003)

All examples in (46) 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 (46) have been referred to as 'associative plurals' (or 'grouping plurals') (Moravcsik 1994, 2003; den Besten 1996; Corbett 2000; Nakanishi and Tomioka 2004; Vassilieva 2005; 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 2 and the similarities between *-men* and the above morphemes in (46), I analyze *-men* in Mandarin as an associative plural as well. Building on the analysis of the associative plural proposed in Nakanishi and Tomioka (2004), I propose that *-men* maps a kind to a salient group, type $\langle e^k, \langle e,t\rangle\rangle$; the semantics of *-men* is proposed to be the one in (47).

(47) $\textit{-men}_{\langle e^k, \langle e, t\rangle\rangle} = \lambda k \lambda Y\, [^{\cup}k_{human} \wedge |Y| > 1 \wedge G(k) = Y]$

In (47), *k* is a kind and k_{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.[12] Differing from Nakanishi and Tomioka (2004) who propose two semantic types for the associative plural *-tachi* in Japanese depending

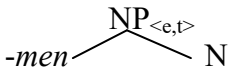
[12] Alternatively, G can be viewed as a relation between kinds and groups. The difference between a function and a relation is trivial for the purpose of our discussion, so we will not go into the detail regarding whether G is a function or a relation.

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.

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 *Zhangsan* 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 nominals in Mandarin, including common nouns and proper names, in Mandarin are kinds; the difference between them is that the former is natural, regular kinds, but the latter is individual kinds. From now on, I will use the term 'noun' to refer common nouns and proper names throughout the paper. After -*men* combines with a noun, the N-*men* is predicative, type <e, t>. [13]

Syntactically, the suffix -*men* merges with a noun, forming an NP (48) (see also Hsieh 2008).

(48)



In the following subsections, I will illustrate how the proposed semantics of -*men* and structure of N-*men* in (47) and (48) help us analyze the properties of the four types of phrases containing -*men* examined in Section 2: (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.

3.3 N-*men*

The goal of this subsection is to show that the proposed analysis of -*men* together with the Neo-Carlsonian approach to bare nominals can derive the properties of N-*men* shown in Section 2 in a principled manner. The properties of N-*men* are repeated below:

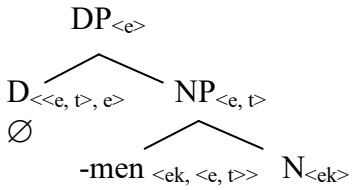
(49) i. [Common Noun -*men*] can receive a definite or a generic interpretation but not a kind nor an indefinite interpretation (3), (27), (28).
ii. [Proper Name -*men*] receives an associative or an additive plural reading (6).
iii. [Pronoun -*men*] receives an additive plural reading (1a, a').

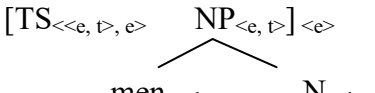
In all examples that we saw, N-*men* is argumental, but the outcome of the NP in (48), according to the proposed semantics of -*men* in (47), is predicative, type <e, t>. Generally, predicative nominals can be turned into arguments by whatever device available in the language, either overt ones (e.g. article determiners *a*/*the* in English) or covert ones (e.g. a null D(eterminer) or a semantic type-shifter). In the specific case of Mandarin, N-*men* can only be turned into an argument via covert operations since this language does not possess an overt article determiner which can block covert operations (*Blocking Principle* in (42b)).

Regarding covert operations, there are two available, a null D in the syntax (e.g. Longobardi 1994; Borer 2005) or a type-shifting operation (TS in short) in the semantics (e.g. Chierchia 1998; Dayal 2004):

(50) a. covert operation in syntax b. covert operation in semantics

[13] For simplification, I use 'noun' to refer to common nouns, proper names and pronouns throughout the paper.



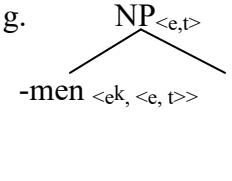


Concerning whether we should choose the covert operation in the syntax (50a) or the covert operation in the semantic (50b) to argumentize the NP in (48), it is crucial to acknowledge that there is no empirical evidence to support one over the other. It is also impossible to prove either of them to be wrong given that both operations are invisible. In this paper, I choose the semantic operation in (50b). 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 in this language. Justifications for the choice made here over the other syntactic possibility will be provided in Section 4.

Given that the NP in (48) is turned into an argument via a type-shifting operation in the semantic, we now need to decide which specific type-shifting operation will do this job. In (40), we saw three type-shifting operations that can turn a property into an argument, namely the iota operator 'ι', the existential closure operator '∃', and the down-operator '$^{\cap}$' (c.f. Section 3.1). These three operations are ranked in the way that both 'ι' and '$^{\cap}$' rank over '∃' (c.f. *Rank of Meaning*, (42aii)). According to this ranking, we expect that the two type-shifting operations 'ι' and '$^{\cap}$' will be first chosen to turn N-*men* into an argument.

When the iota operator "ι" turns N-*men* in to an argument, the argument will receive a *definite* interpretation, correctly capturing the fact in Mandarin that N-*men* receives a definite reading:

(51) a. *xuesheng-men li-kai le*. [definite]
student-MEN leave ASP
'The students has left.'
b. [[xuesheng]] = STUDENT <e^k>
c. [[men]] $_{<e, <e, t>>}$ = λkλY [$^{\cup}k_{human} \wedge |Y| > 1 \wedge G(k) = Y$] <$e^k$, <e,t>>
d. [[xuesheng-men]] = λY [$^{\cup}$STUDENT $\wedge |Y| > 1 \wedge G(STUDENT) = Y$] <e, t>
e. ι [xuesheng-men] = ιY [$^{\cup}$STUDENT $\wedge |Y| > 1 \wedge G(STUDENT) = Y$] <e> (via iota)
f. [[xuesheng-men li kai le]] = ∃e ιx [student-men (x) $\wedge$ leave$_w$ (e, x)]
g.



In (51b), the bare noun *xuesheng* 'student' is kind-referring; when *-men* in (51b) 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 (51c) denotes a property of a salient group represented by one instance of the 'student-kind', type <e, t>. Next, iota "ι" in (51d) 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 NP (51f) and remains an NP after iota "ι" turns it into an argument.

The second option to turn N-*men* into an argument is via the down-operator "$^\cap$" (based on *Rank of Meaning*). 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 1977 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 (37a) and repeated in (52ba).

(52) a. *<u>*baiwanfuweng-men*</u> *xianzai yijing hen pubian le.* [*kind]
millionaire-MEN now already very common Asp
Intended: 'Millionaires are very common now.'
b. [[baiwanfuwen-men]] = λY [$^\cup$millionaire ∧ |Y| >1 ∧ G(millionaire) =Y] <e, t>
c. $^\cap$ [baiwanfuweng-men]
= $^\cap$Y [$^\cup$millionaire ∧ |Y| >1 ∧ G(millionaire) =Y], via "$^\cap$", undefined

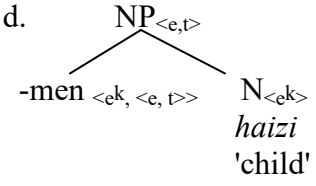
Given that the iota operator "ι" has come to play, turning N-*men* into an argument with a definite interpretation (51), the lower ranked operation "∃" is not an option for argumentizing N-*men* anymore. *Rank of Meaning* predicts that N-*men* cannot be turned into an argument with an *indefinite* reading; this correctly captures the fact in Mandarin (3a), as repeated in (53a).

(53) a.**you* <u>*ren-men*</u> [*indefinite]
have person-MEN
b. [[ren-men]] = λY [$^\cup$person ∧ |Y| >1 ∧ G(person) =Y] <e, t>
c. ∃ [ren-men]
=∃Y [$^\cup$millionaire ∧ |Y| >1 ∧ G(millionair) =Y], via '∃', ruled out by (42aii)

The last interpretation that N-*men* can receive is the generic one (38) (one example is repeated in (54a)). As is well studied, the generic interpretation of a nominal is contributed by the *Gen* operator which quantifies over the whole generic sentence (see Krifka et al 1995 for discussion on *Gen* and genericity). In the generic sentences containing N-*men*, the N-*men* phrase can remain as predicative NP of type <e, t> (54b), with the *Gen* operator binding it (54c). In (54c), 'ACC' is the accessibility relation: ACC (s, s′) iff s′ is accessible from s, and 'C' is a contextually salient relation between individuals and situations: C(x, s) iff x is contextually relevant in s (e.g. see Krifka et al 1995). Structurally, *haizi-men* is still an NP (54d).

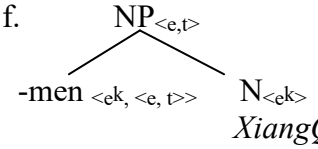
(54) a. <u>*haizi-men*</u> *shi zuguo de weilai.*
child-MEN is nation De future
i. 'Children (in general) are the future of our nation.' [generic]
ii. 'The children are the future of our nation.'
b. [[haizi-men]] = λY [$^\cup$CHILD ∧ |Y| >1 ∧ G(CHILD) =Y] <e, t>
c. [[haizi-men shi zuguo de weilai]]
= ∀x, s [child-men$_s$(x) ∧ C(x,s)] s' ACC(s,s') [be the future of our nation$_{s'}$(child-men$_s$)]

d.



The examples analyzed above only concern common nouns; next, let us turn to the cases in which Ns are proper names (6) and pronouns (1a'). The derivation of [Proper Name-*men*] is essentially the same as that of [Common Noun-*men*]. I repeat an example in (55a).

(55) a. *XiaoQiang-men*
XiaoQiang-MEN
i. 'XiaoQiang and the others'
ii. 'People with the characteristics or the same name of *Xiaoqiang*.'
b. [[XiaoQiang]] = XIAOQIANG <e^k>
c. [[men]] $_{<e, <e, t>>}$ = $\lambda k \lambda Y[^{\cup}k_{human} \wedge |Y| > 1 \wedge G(k)=Y]$ <e^k, <e,t>>
d. [[XiaoQiang-men]] = $\lambda Y[^{\cup}$XIAOQIANG $\wedge |Y| > 1 \wedge G($XIAOQIANG$)=Y]$ <e, t>
e. ι [XiaoQiang-men] = $\iota\lambda Y[^{\cup}$XIAOQIANG $\wedge |Y| > 1 \wedge G($XIAOQIANG$)=Y]$ <e> (via ι)
f.



The proper name *XiaoQiang* is an individual kind, type <e^k> (52b); it combines with *-men* in (52c). G picks out *XiaoQiang* who is saliently associated with a group whose cardinality is more than one to represent that group (52d). Last, iota ι turns the property-denoting '*XiaoQiang*-men' into an argument with a definite interpretation (52e), that is, 'the unique salient group whose cardinality is more than one and which is represented by *Zhangsan* and contains the others associated with him,' deriving the associative plural interpretation in (55ai).

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 (55aii). Syntactically, 'XiaoQiang-*men*' still remains as an NP, same as the ones in (51g) and (54d).

Regarding pronoun-*men* (1a'), 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 (55).

In this subsection, we saw that the proposed analysis of *-men* in Section 3.2 together with the Neo-Carlsonian approach of Chierchia (1998), with the specific modification of *Ranking of Meaning* from Dayal (2004), correctly predicted the definite and generic interpretations of N-*men* and ruled out its indefinite and kind interpretations. We showed that the derivation of proper name-*men* and pronoun-*men* is essentially the same as that of common noun-*men*. The proposed

analysis of *-men* not only explained the additive plural interpretation but also the associative plural interpretation. Structurally, N-*men* has been simplified as an NP and remains as an NP 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.

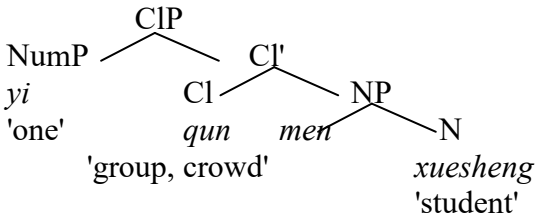
3.4 The [Num Cl N-*men*] phrase

In Section 2.2.2, we saw that N-*men* can combine with group classifiers, appearing in the post-classifier position (12); such a phrase can appear in existential sentences (14) and can also combine with a demonstrative (12). Two examples are repeated below:

(56) a. *qiao, you you yi qun haizi-men lai yao tang le.*
Look, again exist one $Cl_{crowd/group}$ child-MEN come ask-for candy Asp
'Look, there is a crowd of kids coming to ask for candies again.'
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?'

Let us first look at the structure of this phrase. As we showed in Section 2.2.2, the position of *-men* should be in a position local to the bare noun and lower than the numerals and classifiers. I propose that the [Num Cl_{group} N-*men*] phrase share the basic structure as the numeral classifier phrases without *-men* [Num Cl N], as illustrated below:

(57)



The above structure is built on the structure of the numeral classifier phrases that we saw in (39b). The difference between (39b) and (57) lies in that the NP in the form is a bare noun but the NP in the latter consists of a bare noun and the associative plural *-men*.

Turning to the semantics; in Section 3.1, I adopt the analysis that classifiers serve to shift the denotation from kinds to sets and to relate kinds to numerals. This analysis can be extended to other types of classifiers as well. Below I illustrate with a group classifier *zu* 'team/section'.

(58) a. *liang zu xuesheng*
two $Cl_{team/section}$ student
'two teams/sections of students'
b. $[[zu]] = \lambda k \lambda n \lambda x\ [^{\cup}k(x) \wedge \mu_{team/section}(x) = n]$ $<e^k, <n, e>>$
c. $[[liang]] = \lambda P[f_{\exists}two(P)]$ $<<e, t>, e>$
d. $[[liang\ zu\ xuesheng]] = f_{\exists}\ (\lambda x\ [^{\cup}STUDENT(x) \wedge \mu_{team/section}(x) = two])$ $<e>$

In (58b), *zu* 'team, section' serves to turn the kind-referring noun *xuesheng* 'student' to a set and to relate numeral the numeral (58c) with the bare noun; '$\mu_{team/section}(x)$' means that x is

measured/formed in teams/sections. So *liang zu xuesheng* in (58d) denotes two teams/sections of students.

When *-men* combine with bare nouns, I propose that group classifiers have a derived use can serve to relate salient groups with numerals and to specify the information as to how the newly created set is formed/measured, e.g. by groups, by sections or by teams (59).[14]

(59) Derived use of group classifiers:
$Cl_{group/team/section/pile} = \lambda G \lambda n\, \lambda x\, [G(x) \wedge \mu_{group/team/section/pile}(x) = n]$

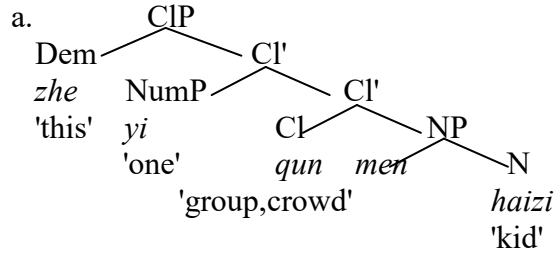
In the case of the phrase in (56), the semantics of *yi qun haizi-men* 'a crowd of kids' is given below:

(60) = (56a)
a. $[[\text{haizi-men}]] = \lambda Y\, [^{\cup}KID \wedge |Y| > 1 \wedge G(KID)=Y]$ <e, t>
b. $[[\text{qun}]] = \lambda G \lambda n \lambda x\, [G(x) \wedge \mu_{group/crowd}(x) = n]$ <<e, t>, <n, e>>
c. $[[\text{yi}]] = \lambda P[f_{\exists}\text{one}(P)]$ <<e, t>, e>
d. $[[\text{yi qun haizi-men}]] = f_{\exists}(\lambda x\, [\text{haizi-men}(x) \wedge \mu_{group/crowd}(x) = \text{one}])$ <e>

In (60c), the numeral is treated as an indefinite determiner (c.f. Section 3.1); *yi qun haizi-men* in (60d) then is an argument of an indefinite interpretation, namely 'a group/crowd of kids'. Such an analysis explains why [Num Cl_{group} N-*men*] can appear in existential sentences (56a).

Since the [Num Cl_{group} N-*men*] phrase is argumental rather than predicative in (60), we might well ask, then, how they might combine with demonstratives as in (56b). Here, I take the position that numerals are ambiguous between indefinite determiners and adjectival modifiers argued in Dayal (2012) and Jiang (2012). I give below a derivation to show this.

(61) = (56b)
a.



b. $[[\text{yi}]] = \lambda P[\text{one}(P)]$ <<e, t>, <e, t>>
c. $[[\text{yi qun haizi-men}]] = \lambda x\, [\text{haizi-men}(x) \wedge \mu_{group/crowd}(x) = \text{one}]$ <e, t>
d. $[[\text{zhe yi qun haizi-men}]] = \iota x[\text{haizi-men}(x) \wedge \mu_{group/crowd}(x) = \text{one} \wedge x \text{ is in this}_n]$

Regarding demonstratives, I adopt the view that they occur in the specifier position rather than the head position (Giusti 1997, 2002; Brugè 2000, 2002; Alexiadou et al 2007, a.o.); as for their semantics, I follow Kaplan (1989), Wolter (2006) and Dayal (2012) and assume that demonstratives are property seeking functions with indexically individuated situations. So the

[14] Regarding why group classifiers are so unique….. 'group' is a very complex issue, references

phrase *zhe yi qun haizi-men* 'this group of kids' has the semantics in (61d), in which this$_n$ denotes a non-distal situation that the speaker is pointing at.

The structure and semantics of [Num Cl$_{group}$ N-men] proposed above can be extended to proper names. Proper name-*men* can appear with group classifiers in the post-classifier position, as we saw in (16); we illustrate the structure and semantics below.

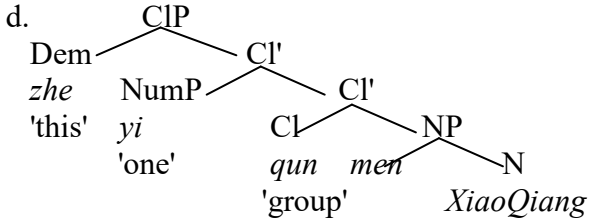
(62) = (16a)

a. [[XiaoQiang-men]] = λY [$^{\cup}$XIAOQIANG ∧ |Y| >1 ∧ G(XIAOQIANG) =Y] <e, t>

b. [[yi qun XiaoQiang-men]] = λx [XiaoQiang-men(x) ∧ μ_{group} (x) = one] <e, t>

c. [[zhe yi qun XiaoQiang-men]] = ιx[XiaoQiang-men(x) ∧ μ_{group} (x) = one ∧ x is in this$_n$]

d.

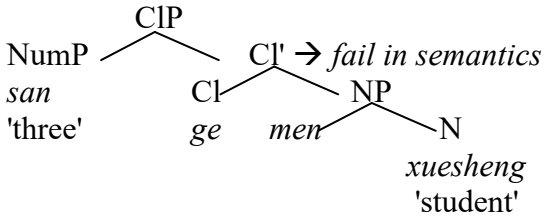


Note that, when group classifiers occur with [Proper Name-*men*], the associative plural reading is missing and only the additive plural reading is available. The reason is straightforward, i.e. when counting, we do not count the same individual or the same set of individuals twice. If a group contains XiaoQiang and people associated with him, this group is a salient unique group containing these people, and there are no other groups that contain the identical members; this renders the associative plural reading unavailable.

One last but very important fact to explain in this sub-section is why -*men* is not allowed in the numeral-classifier-noun structure when the classifiers are individual classifiers, as seen in (5) and repeated in (63a). I propose that the structure of (63a) is the same as the one in (57) and that the unacceptability of (63a) is the result of the semantics of individual classifiers clashing with the denotation of N-*men* , as demonstrated below:

(63) a. *san-ge* *xuesheng(*-men)*
three-Cl student-MEN
'three students'

b.



c. [[ge]] = λkλnλx [n(AT([$^{\cup}$k(x)))] <e^k, <n, e>>

d. [[xuesheng-men]] = λY [$^{\cup}$STUDENT ∧ |Y| >1 ∧ G(STUDENT)=Y] <e, t>

e. [[ge xuesheng-men]] = ?? uninterpretable

As we saw in Section 3.1, individual classifiers like *ge* turn kinds to a set of atomic instantiations of the kind (40b)/(63c); however, N-*men* denotes a salient group of plural individuals (63d), which cannot provide the correct semantics that individual classifiers look for. Consequently, *ge*

xuesheng-men is not interpretable in the semantics (61d), 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 (61f).

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 ge N-*men*] phrase, and its properties.

3.5 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* and *duo* (19). The syntactic and semantic properties of this [Num-Approximation Cl N-*men*] phrases are repeated below:

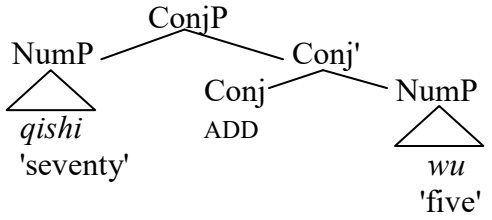
(64) Properties of [Num-Approximation Cl N-*men*]
i. definite interpretation
ii. *ji*/*duo* can appear in pre-numeral and/or post-numeral position
iii. the position of *ji*/*duo* determines whether the phrase involves addition or multiplication.

In order to analyze the structure and the semantics of the [Num-Approximation Cl N-*men*] phrase, let us fist understand the structure and semantics of numeral approximation containing *ji*/*duo*.

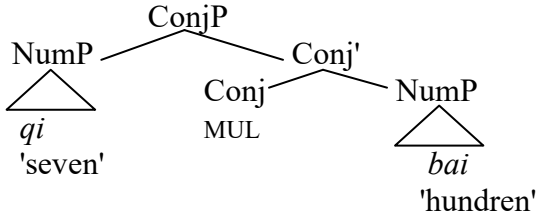
3.5.1 Structure and semantics of numerical approximation using *ji/duo*

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.

(65) a. Structure of an additive numerical (*qishi-wu* 'seventy five')



b. Structure of a multiplicative numeral (*qi-bai* '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 properties, 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.

(66) a. [[n]] = λd[d = n] <d, t> (Solt 2015; Anderson 2015)
b. [[ADD]] = λ*D*λ*D′*λ*d*∃*d′*, *d″* [*d* = *d′* + *d″* ∧ *D*(d') ∧ *D′*(*d″*)] (Anderson 2015)
c. [[MUL]] = λ*D*λ*D′*λ*d*∃*d′*, *d″* [*d* = *d′* × *d″* ∧ *D*(d') ∧ *D′*(*d″*)] (Mendia 2016)

Based on (66), the complex numerals *qishi-wu* 'seventy five' and *qi-bai* 'seven hudred' in (67) have the following derivations:

(67) a. [[qishi]] = λd[d = seventy]]
b. [[wu]] = λd[d = five]]
c. [[qishi ADD wu]] = λ*d*∃*d′*, *d″* [*d* = *d′* + *d″* ∧ [[seventy]] (d') ∧ [[five]] (*d″*)]
d. [[qi]] = λd[d = seventy]]
e. [[bai]] = λd[d = hundred]]
f. [[qi MUL bai]] = λ*d*∃*d′*, *d″* [*d* = *d′* × *d″* ∧ [[seven]] (d') ∧ [[hundred]] (*d″*)]

In (67c), *qishi-wu* 'seventy five' is split into its component parts, a degree equal to *5* (67b) and a degree equal to *70* (67a), by adding 5 and 70, we obtain a newly formed property of degree *75*. Similarly, *qi-bai* 'seven hundred' is split into a degree equal to 100 (67e) and a degree equal to 7 (67d), and multiplication of 7 and 100 results in a newly formed property of degree 700.

Turning to numeric approximation using *ji/duo*, in Section 2.2.2, I presented a description of the syntactic and semantic properties of numerical approximation using *ji/duo*; crucially, these properties are also attested in numerical approximation using *some* in English and numeral approximation using *nam* in Janpanese (see Anderson 2015; Mendia 2016). Relevant examples from English and Japanese are provided below:

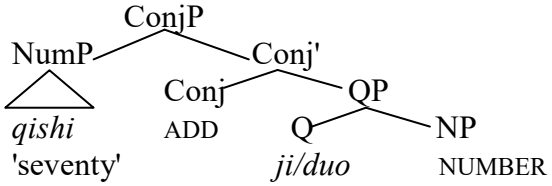
(68) a. twenty-some students (English)
b. *Juu-nan-nin-ka-ga kita*. (Japanese)
ten-what-Cl$_{(people)}$-ka-NOM came
'10 plus x people came.'
c. *Nan-juu-nin -ka-ga kita*.
what-ten-Cl$_{(people)}$-ka- NOM came
'x multiple 10 people came.' (Anderson 2015)

Based on the properties numeral approximation using *ji*/*duo* and the similarities among *ji/suo*, *some* and *nan* in numerical approximation constructions, 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).

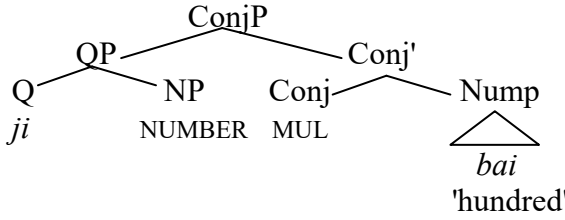
Syntactically, I analyze *ji* and *duo* as a quantifier head (Q) which takes an NP compliment. Following Anderson (2015), I assume that the complement to Q is a silent noun

NUMBER, along the lines proposed by Kayne (2005) and Zwig (2005). The structure of numerical approximation using *ji* and *duo* are given below.

(69) a. *qishi-ji/duo*
seventy-a few/many
'seventy-some'
b. Structure of an additive numerical approximation phrase



(70) a. *ji-bai*
a few-hundred
'a few hundred'
b. Structure of a multiplicative numerical approximation phrase



Regard the semantics of *ji*/*duo*, it can be analyzed in the similar way as *some* in numeral approximation phrase proposed in Anderson (2015) (71a).[15] As for the semantics of the silent noun NUMBER, I adopt the analysis in Mendia (2016) which treats its denotation as the set of 'basic' numbers (71b).

(71) a. [[ji/duo]] = $\lambda f_{(dt,dt)}\lambda D\lambda d$: anti-singleton($f$)[$f$($D$)($d$)]
b. [[NUMBER]] = {1, 2, 3, 4, 5, 6, 7, 8, 9}

The logic forms of the two phrases in (69a) and (70a), after some reduction, would look as the ones below:

(72) a. [[qishi-ji]] = [[qishi ADD ji NUMBER]]
$= \lambda d \exists d', d''$[d = $d' + d'' \wedge$ [[seventy]](d') $\wedge$ [[ji NUMBER]](d'')]
$= \lambda d \exists d', d''$[d = $d' + d'' \wedge$ [[seventy]](d') $\wedge$ f($0 < d'' < 10$)]
$= \lambda d$ [f ($70 < d < 80$)]
b. [[ji-bai]] = [[ji NUMBER MUL bai]]
$= \lambda d \exists d', d''$[d = $d' \times d'' \wedge$ [[ji NUMBER]](d') $\wedge$ [[hundred]](d'')]
$= \lambda d \exists d', d''$[d = $d' \times d'' \wedge$ f($0 < d' < 10$) $\wedge$ [[hundred]](d'')]

[15] Anderson's (2015) analysis of English *some* in numeral approximation structures is based on the analysis of Spanish *-algún*, a morpheme that can express ignorance with respect to number, in Alonso-Ovalle and Menéndez-Benito (2010).

$= \lambda d\,[f\,(100 < d < 1000)]$

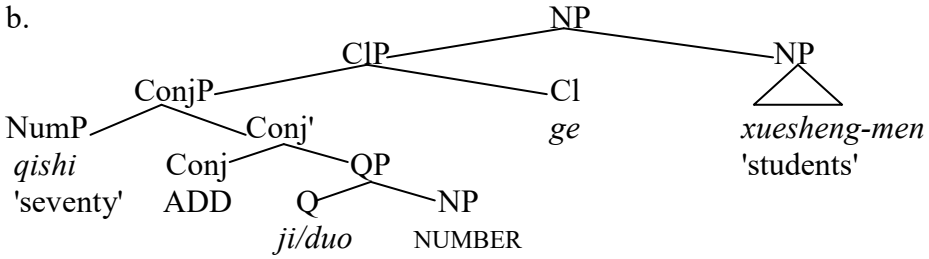
With the analysis of numeral approximation using *ji/duo* in place, we now can proceed to analyze the [Num-Approximation Cl N-*men*] phrase.

3.5.2 Structure and semantics of [Num-Approximation Cl N-men]

I propose a right-adjunction structure for [Num-Approximation Cl N-men] (73b), with one example repeated in (73a).

(73) a. *qishi duo/ji ge xuesheng-men*
seventy many, which/a few, how many Cl student-MEN
'seventy-some students'

b.



In (73b), the classifier and the complex numeral form a constituent, serving as a modifier to N-*men* (73b). 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), as illustrated in (71) and (72).

(74) 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)

(75) a. *Liu laoshi zhengzai zhidao qishi duo ge xuesheng-men lianxi.*
Liu teacher Prog guide seventy more Cl student-MEN practice
'Teacher Liu is providing practice guidance to more than seventy students.'
b. *Liu laoshi zhengzai zhidao xuesheng-men lianxi, dagai you qishi duo ge.*
Liu teacher Prog guide student-MEN practice about have seventy more 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).

When numerals combine with individual classifiers as a constituent, I adopt the analysis in X. Li (2011) 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 phrase in (73a) is given below.

(76) a. [[ge]] = λnλx [EST(x) = <n, U_{atom}>] <d, <e, t>>
b. [[qishi-ji]] = λ*d* [*f* (70 < *d* < 80)] = (69) <d, t>
c. [[qishi-ji]] = ι*d* [*f* (70 < *d* < 80)] <d> (via iota)
d. [[qishiji Cl_{ind}]] = λx [EST(x) = <ι*d* [*f* (70 < *d* < 80)], U_{atom}> <e, t>
e. [[xuesheng-men]] = λY [$^{\cup}$STUDENT ∧ |Y| >1 ∧ G(STUDENT)=Y] <e, t>
f. [[qishi-ji ge xuesheng-men]] (via Predicate Modification)
= λx [EST (x) = <ι*d* [*f* (20 < *d* < 30)], U_{atom}> ∧ xuesheng-men (x)] <e, t>
g. [[qishi-ji ge xuesheng-men]] (via iota)
= ιx [EST (x) = <ι*d* [*f* (20 < *d* < 30)], U_{atom}> ∧ xuesheng-men (x)] <e>

In (76a), EST is a 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 (76b), the denotation of *qishi-ji* 'seventy-some' is a property of degree, type <d, t> (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 (76c) (see also Anderson 2015 for numerical approximation using *some*). So the modifier *qishi-ji ge* 'seventy-some Cl_{ind}' in (76d) denotes a set of atomic entities whose estimated value is seventy-some (70 < n < 80), type <e, t>. The head NP *xuesheng-men* denotes a salient group of students, also type <e, t> (c.f. Section 3.3). By applying Heim and Kratzer's (1998) Predicate Modification to these two property-denoting phrases, the phrase '*qishi-ji ge xuesheng-men*' in (73a) then denotes a salient group of students whose estimated value is seventy-some (i.e more than 70 but less than 80) (76f).

Note that, the modified phrase in (76f) denotes a property of type <e, t>. According to *Rank of Meaning* in (42aii), the iota operator can turn it into an argument with a definite interpretation, i.e. the group of students whose estimated value is seventy-some. The availability of the iota type shifting excludes the possibility of turning the modified NP into an argument with a indefinite interpretation via the ∃ operator (due to *Rank of Meaning*). Of course, another possibility is to argumentize the property-denoting NP in (76f) via the down-operator $^{\cap}$, but this possibility is ruled out since the denotation of kinds requires all individuals not just a group of individuals.

The proposed semantics in (76) naturally explains why the existential sentence does not allow the [Num-Approximation Cl N-men] phrase (as seen in (20b)), i.e. this phrase is a definite expression (76g) which does not satisfy the indefinite requirement of the existential sentence.

One may wonder why the phrase in (5) **san ge xuesheng-men*, which has received an analysis in (63), cannot be analyzed like the one in (73) and (76). The reason is not hard 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.

Now let us analyze the structure and semantics of the last type of phrases containing *-men*, [N-*men* Num Cl (person)].

3.6 The appositive phrase containing *-men* [N-men Num Cl (person)]

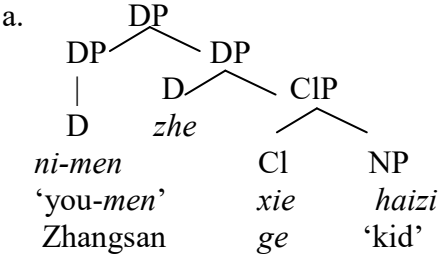
As discussed in Section 2.3.1, [N-*men* Num Cl (person)] is an appositive nominal phrase in which the numeral-classifier servers as a non-restrictive modifier to N-*men*. I repeated the properties of this phrase in (77), with three examples repeated in (78).

(77) 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

(78) 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) analysis of nominal appositives in Mandarin. In del Gobbo (1999), she proposes the adjunction structure in (79a) for nominal appositives like the ones in (78b, c).

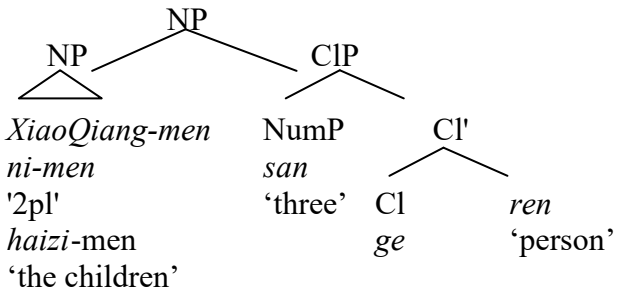
(79) a.



b. *nimen zhe xie haizi*
you-Men this Xie children
'those of you who are children'
c. *Zhangsan zhe ge haizi*
Zhangsan Dem Cl children
'Zhangsan, this kid' (del Gobbo 1999)

The examples in (79b, c) are very much like the ones that we examined in Section 2.3.1. Based on the left-adjunction structure in (79a), I propose the structure of appositive nominals [N-*men* Num Cl (person)] in (78) to be the one below:

(80)



Note that, the adjunction between the NP 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* 'child' 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-*men* 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 (81).

(81) APP(P)(x)= x if P(x), else undefined

The proposed analysis of the structure and the semantics of the nominal appositive allows us to understand why *-men* is obligatory in the [N-*men* Num Cl (person)] 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 (8c) (as repeated in (82)).

(82) ?/**wo qing pengyou-men sange (ren) chifan.*
I invite friend-MEN three-Cl person eat
'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 (82) 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 (82) to the extent that we can provide a plausible number to describe the total/maximal number of its members, this sentence should become acceptable. This prediction is borne out:

(83) *wo qing [zu li de pengyou-men] shi-ge (ren) chifan.*
I invite team in De friend-MEN ten-Cl person eat
'I invited the friends in the team, ten of them, for a meal.'

3.7 Section Summary

In this section, I analyzed *-men* as an associative plural whose function is to map a human kind to a salient group, type $\langle e^k, \langle e,t\rangle\rangle$ and 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 nominals containing *-men*. We saw that the properties of the four types of phrases containing *-men* noted in Section 2, (i) N-*men*, (ii) [Num Cl_{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 next section, I will discuss why a Neo-Carlsonian approach is better to handle Mandarin and classifier languages in general and two issues regarding NPs with *-men* that remain in need of future exploration.

4 Theories of nominal arguments and remaining issues

4.1 Why a Neo-Carlsonian view of bare nominals?

In this paper, I adopted the Neo-Carlsonian view that bare nominals denote kinds and that their object level meanings are derived from their basic kind level meaning. In the literature, another approach has been proposed for bare nominals regarding their references. That approach takes bare nominals to be ambiguous between kind-referring and indefinite 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 (1998). One of the main arguments that the opponents have against the Ambiguity Approach is that such an approach has problems in explaining the special narrowest scope properties of bare plurals (Carlson 1977). In addition, the Ambiguity Approach lacks specific theory for predicting cross-linguistic variation in the form and interpretation of noun phrases (c.f. Dayal 2004, 2012).

On the contrary, The Neo-Carlsonian approach does have such a theory (e.g. (41), (42)) which draws evidence from bare nominals in a much wider range of languages. 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). These work on various classifier languages provide cross-linguistic arguments for the Neo-Carlsonian approach.

Turning to the facts regarding the associative plural *-men* in Mandarin, I showed that the properties of the four types of NPs containing *-men* fall nicely within the predictions of the theory in the Neo-Carlsonian approach (cf. Section 3). Hence, NPs containing *-men* in Mandarin provide further arguments to confirm and strengthen the Neo-Carlsonian approach.

In addition to the debate regarding the references of bare nominals, there is another intense debate on how nouns become arguments. Broadly speaking, there are two main camps. Some authors claim that nouns have fixed denotations across languages (namely, properties) and must co-occur with an article D in order to serve as an argument (e.g. Abney 1987; Longobardi 1994 et seq; Borer 2005). Whenever no overt D is to be seen, a covert one is to be assumed. According to this view, the functional category D is always universally projected. Other authors maintain that D projection is not universal and is subject to parameterization (e.g. Fukui 1986, 1988; Chierchia 1998; Dayal 2004; Bošković 2005 et seq). Whether D is syntactically projected or not depends on one of three things: the possibility that nouns may be inherently argumental (i.e. kind-referring) (Krifka 1995; Chierchia 1998), the availability of a semantic operation that

turns nouns of the property-type into arguments, subject to some kind of blocking (e.g. Dayal 2004) and the availability of visible evidence of the functional category in the primary linguistic data (e.g. Fukui 1986, 1988; Fukui and Sakai 2003).

With regard to Mandarin, this language lacks overt evidence of an article determiner, and all bare nouns are freely argumental. Such facts have stirred up the debate on whether Mandarin nominal arguments project a DP or an NP since the 90s (Tang 1990; Lin 1997; Li 1998, 1999; Chierchia 1998; Cheng and Sybesma 1999, 2012; Simpson 2003a, b; Saito et al 2008; Zhang 2008; Liao and Wang 2011; Cheng 2011; Jiang 2012; Bošković and Hsieh 2013, 2015; a.o.). In the specific case of phrases containing *-men*, there are also two views. Some authors propose a null DP analysis (e.g. Li 1999; Kurafuji 2004; Yang 2005; Hsieh 2008); some others pursue a D-less analysis (e.g. Jiang 2012; Bošković and Hsieh 2013).

This paper does not adopt the view that DPs are universal and argues for a D-*less* analysis of nominal arguments with *-men* in Mandarin. We have seen in Section 3 that the properties of the four types of phrases containing *-men* noted in Section 2 are amenable to an analysis of *-men* as an associative plural within well-established principles of interpretation. It was shown that it is unnecessary to posit a functional category D that is always invisible in the grammar of Mandarin in order to account for the behavior of nominals containing *-men*. This is arguably a simpler analysis of Mandarin nominal arguments since it avoids stipulating the presence of invisible function projections, namely DPs, that otherwise have no overt manifestation in this language.

Below I will provide two further arguments against the universal DP analysis of nominal arguments. First, a universal property-denoting analysis of bare nouns cannot provide good reasons to justify classifiers in general. If nouns in classifier languages are also property-denoting, type <e, t>, then they will have to be true of something. There could be at least two possibilities. One way is to assume that these nouns are mass only properties (e.g. Krifka 2004); then classifiers are needed to quantize these nouns, i.e. to turn mass properties into natural sub-properties (atomic or non-atomic). Another way is to assume that nouns in classifier languages are properties which are underspecified for mass and count; then every noun can apply to either the whole individuals or the parts that they are of. Hence, a noun like 'shrimp' in classifier languages, for example, will be true in a world of 'shrimps' or 'parts they are of' (i.e. shrimp meat), so would have to be true with 'dog', 'table', 'water', 'blood' and any other nouns. Then classifiers are needed to quantize these nouns, i.e. to turn "underspecified properties" into "natural sub-properties".

Although the above 'property' thesis might seem appealing, it runs into a serious problem. As both theoretical work and experimental work have argued, the mass-count distinction is present at the lexical level or some pre-syntactic level (e.g. Imai and Gentner 1997; Cheng and Sybesma 1999; 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 class of classifiers, i.e. 'individual classifiers' (these are the 'count-classifier' in Cheng and Sybesma 1999), must combine with nouns that are conceptually-count; in contrast, other classes of classifiers, such as 'measure classifiers' and 'container classifiers', do not have such a restriction, i.e. they can combine with either conceptually count or mass nouns. The behavior of individual classifiers presupposes that nouns in classifier languages are lexically divided to 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 undistinguished in mass properties and count properties, the restriction on individual

classifiers would have no force, and one would wrongly expect that individual classifiers should work with both types of nouns just like other types of classifiers do. Hence, if nouns are properties in classifier languages, there is no good reason to justify classifiers.

Second, the universal DP would wrongly predict the forms of nominal arguments in classifier languages. If we assume that all bare nouns are property denoting, we should expect that the article determiner can always combine with bare nouns directly just as the determiner *the* in English combines with the bare nouns. However, as shown in Jiang and Hu (2010) and Jiang (2012), Yi, a language with an overt definite article determiner and a obligatory system of classifiers, bans its article determiner to combine with bare nouns directly. Furthermore, if nouns in classifier languages always enter grammatical computations as properties as the universal DP hypothesis assumes, one might expect there to be classifier languages that disallow (certain kind of) bare arguments. In particular, there ought to be classifier languages like French that always disallow bare arguments, or classifier languages like English that disallow singular count nouns to be arguments. Nevertheless, so far as we know, this does not happen in any classifier languages.

4.2 Issues for future research

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 (84a), but-*men* marked nouns can (84b).[16]

(84) 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 (84a) acceptable, three strategies could be employed: (i) to place *dou* 'all' in the sentence containing the bare noun (85a);[17] (ii) to use *zhe xie* 'Demonstrative *xie*' with the bare noun (85b); and (iii) to provide a contrastive context (85c). In addition, any combination of the above three strategies could also make (84a) acceptable, as exemplified in (85d).

(85) 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.

[16] As is well known, bare nouns in Mandarin can freely refer anaphorically to a singular individual:
(1) *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'

[17] Liao (2011) for a recent discussion of Mandarin *dou* and related references.

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 north.

d. *women ban you shi ge nansheng er-shi ge nvsheng,*
our class have ten Cl boy twenty Cl girl
na xie nansheng dou shi cong nanfang lai de,
that Xie boy Dou be from south come De,
nvsheng dou shi cong beifang lai de.
girl Dou be from north come De
'There are thirty boys and twenty girls in our class. Those boys are all from the south, and the girls are all 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 (86) and (87) respectively.

(86) a. *Wo jia yang le yi zhi wu-gui. Wu-gui zaoshang yiban bu zenme chi dongxi.*
I family raise Asp one Cl turtle. Turtle morning usually not how eat things
'My family has one turtle. The turtle does not eat that much in the morning.'

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.'

(87) a. *Wo mai le yi ba yizi he yi zhang zhuozi. Zhuozi shi cong deguo jinkou de.*
I buy Asp ten Cl chair and ten Cl desk. Desk is from Germany import De.
'I bought one chair and one desk. The desk was imported from Germany.'

b. *Wo mai le shi ba yizi he shi zhang zhuozi. Zhuozi shi cong deguo jinkou de.*
I buy Asp ten Cl chair and ten Cl desk. Desk is from Germany import De.
'I bought 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 NPs with *-men* cannot serve as predicates, as we saw in (36a) (and repeated in (88)).

(88) a. *Tamen shi laoshi(*-men)*
they be teacher-MEN
'They are teachers.'

In my analysis in Section 3, I treat N-*men* as property-denoting which is turned into an argument via semantic type-shifting operations. A question that naturally comes up 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 for N-*men* since one may as well wonder why the N-*men* that a null D combines with cannot occur in the predicate position.

4.3 Section Summary

In this section, I discussed why a Neo-Carlsonian approach is better to handle Mandarin and classifier languages in general. I compared the Neo-Carlsonian approach with the Ambiguity Approach and addressed the debate on how nouns become arguments (i.e. the DP-NP debate). I provided further arguments showing why I support the view that the D projection is *not* universal. Two issues regarding NP with *-men*, namely that it seems to prevent human bare nouns from freely anaphorically referring back to a plural individual and that it cannot be used as predicates, were discussed but explanations were left for the future.

5. Conclusion

In conclusion, I discussed the syntactic and semantic properties of four types of phrases containing *-men*, (i) N-*men*, (ii) [Num Cl_{group} N-*men*], (iii) [Num-Approximation Cl N-*men*] and (iv) [N-*men* Num Cl (person)], and defended the view that *-men* should be treated a plural marker first argued in Li (1999). However I argued against the analysis of positing *-men* in the D position or treating it as a definite determiner. I proposed an analysis of *-men* as associative plural and showed that the properties of the four types of phrases containing *-men* are amenable to well-established principles of meanings within the Neo-Carlsonian approach to bare nominals. The formal account for the syntax and semantics of phrases containing *-men* in this paper 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 evidence for the lack of DP in Mandarin.

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