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On word order, binding relations, and plurality in Chinese Noun Phrases*

Abstract
We provide a semantic account of the free ordering of NP-internal elements in Chinese and argue that this provides evidence for the lack of DP in Chinese. We also extend this account to the Mandarin plural marker *-men*, tying the definiteness of *-men* phrases and its number/definiteness interaction to the classifier status of *-men* and the lack of DP in Chinese. We show that the binding properties of Chinese possessors also provide evidence for the no-DP analysis of Chinese. Finally, we propose a semantic account of certain differences in the order of NP-internal elements between Chinese and Serbo-Croatian, another language that lacks DP.

Key Words
adjectives, classifiers, demonstratives, possessors, relatives

Streszczenie
Przedstawiony w artykule opis semantycznych uwarunkowań swobodnego szyku składników fraz nominalnych w języku chińskim jest dla autorów podstawą twierdzenia, że język ten nie posiada składniowej kategorii DP. Rozszerzając analizę na wykładnik liczby mnogiej *-men*, autorzy łączą określoność fraz zawierających ten wykładnik oraz interakcje między semantyką liczby mnogiej i referencji określonej *-men* z jego statusem klasyfikatora, a także z brakiem projekcji składniowej DP w języku chińskim. Również własności przydawek dzierżawczych w chińskich frazach nominalnych sugerują brak kategorii DP w gramatyce języka chińskiego. Artykuł zawiera również semantyczny opis niektórych różnic w porządku linearnym składników fraz nominalnych pomiędzy językiem chińskim i językiem serbsko-chorwackim, również pozbawionym składniowej kategorii DP.

Słowa klucze
przymiotnik, klasyfikator, zaimek wskazujący, zaimek/rzeczownik dzierżawczy, zaimek względny

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1. Introduction

Bošković (2008, 2012) argues based on a number of syntactic and semantic generalizations that languages without articles, like Chinese, lack DP.[1] Chierchia (1998) makes the same claim for languages like Chinese based on very different considerations regarding the semantics of traditional Noun Phrases (TNPs).[2] In this paper we will explore several issues regarding the structure and semantics of Chinese TNP within this general approach. In particular, we will show that the ordering of TNP-internal elements in Chinese follows from semantic considerations and provides additional evidence for the no-DP analysis of Chinese. We will also address the distribution of the plural marker *-men* in Mandarin, providing an account of it in a system that treats Classifier-Phrase (ClP) as the source of definiteness in Chinese (see Cheng and Sybesma 1999). Finally, we will discuss some issues regarding the binding properties of Chinese possessors. We will start the discussion by examining how one of Bošković's (2008) generalizations, namely the negative raising generalization, applies to Chinese.

2. The NP/DP parameter and negative raising

It is standardly assumed languages without articles have a null D; the difference between (1) and Chinese (2) is standardly assumed to be PF-based, the only difference being that D is phonologically null in Chinese.

(1) The stone broke the window.

(2) Shitou za-pou le chuanghu.
stone pound-break PERF window
'The stone broke the window.'

Bošković (2008, 2012) argues there is a fundamental structural difference in the TNP of English and article-less languages like Chinese based on a number of syntactic and semantic phenomena that correlate with the presence/absence of articles, given below.[3]

[1] For relevant discussion of Chinese, see Cheng and Sybesma (1999, 2012), Jiang (2012), Cheng (2013), among others.

[2] TNP is a neutral term that does not take a stand on the potential presence of functional projections in this domain.

[3] See Bošković (2008, 2012) for detailed discussion, including illustrations of (3)–(4) and the precise definitions of the phenomena referred to in these generalizations (e.g. what is meant by scrambling in (3)c is long-distance scrambling from finite clauses of the kind found in Japanese). Notice also that what matters for these generalizations is the presence of a definite article

(3) Generalizations (Bošković 2008 and references therein)

a. Only article-less languages may allow left-branch extraction out of TNPs.
b. Only article-less languages may allow adjunct extraction from TNPs.
c. Only article-less languages may allow scrambling.
d. Multiple-*wh* fronting article-less languages do not show superiority effects.
e. Only languages with articles may allow clitic doubling.
f. Article-less languages do not allow transitive nominals with two genitives.
g. Head-internal relatives display island sensitivity in article-less languages, but not in languages with articles.
h. Polysynthetic languages do not have articles.
i. Only languages with articles allow the majority reading of MOST.
j. Article-less languages disallow negative raising (i.e. strict clause-mate NPI licensing under negative raising); those with articles allow it.

(4) Additional generalizations (Bošković 2012 and references therein)

a. Negative constituents must be marked for focus in article-less languages.
b. The negative concord reading may be absent with multiple complex negative constituents only in negative concord languages with articles.
c. Radical pro-drop may be possible only in article-less languages.
d. Number morphology may not be obligatory only in TNPs of article-less languages.
e. Elements undergoing focus movement are subject to a V-adjacency requirement only in languages with articles.
f. Possessors may induce an exhaustivity presupposition only in languages with articles.
g. Inverse scope for S-O is unavailable in article-less languages.
h. Sequence of Tense is found only in languages with articles.
i. Second position clitic are found only in article-less languages.
j. Obligatory numeral classifier systems are found only in article-less languages.
k. Only article-less languages may allow subject reflexives.

These generalizations, which are syntactic and semantic in nature, show there is a fundamental difference in the TNP of languages with articles and article-less languages that cannot be reduced to phonology (overt vs. null articles). Furthermore, Bošković (2008, 2012) and Bošković and Gajewski (2011) show the generalizations can be deduced if article-less languages lack DP. Moreover, the NP/DP analysis provides a uniform account of these differences, where a single difference between the two language types is responsible for all of them.

It's important to note that many of the above generalizations are one-way correlations. Furthermore, many of them involve phenomena that are not widely attested crosslinguistically. However, as Bošković (2012) notes, a number of these generalizations are still relevant for Chinese, in particular (3)i, j and (4)a, c, d, e, f, g, j, k. Furthermore, Cheng (2013) provides a detailed discussion of the arguments for DP in Chinese from the literature and demonstrates that they all face very serious problems (see also that work for ad-

in a language since Slovenian, which has indefinite but not definite article, patterns with article-less languages regarding these generalizations, see Bošković (2009b).

ditional arguments for the no-DP analysis of Chinese). In light of the above generalizations, Chierchia's (1998) no-DP analysis of the semantics of Chinese TNP, and Cheng's criticism of the existing DP analyses of Chinese we will assume here that Chinese lacks DP. Before we discuss some of the consequences of this analysis we will examine one of the above generalizations, namely (3)j, with respect to Chinese.

The generalization concerns the possibility of licensing strict clause-mate NPIs under negative raising (NR). With NR, negation behaves as if it were located lower than where it surfaces, as confirmed by the strict clause-mate NPIs in (7). That these items require negation is shown by (5), while (6) shows non-NR verbs like *claim* disallow long-distance licensing of these items. Since they require clause-mate negation, negation must be present in the embedded clause of (7) when the NPIs are licensed.

(5) a. John didn't leave/*left until yesterday.
b. John hasn't/*has visited her in at least two years.
(6) a. *John didn't claim [that Mary would leave [$_{NPI}$ until tomorrow]].
b. *John doesn't claim [that Mary has visited her [$_{NPI}$ in at least two years]].
(7) a. John didn't believe [that Mary would leave [$_{NPI}$ until tomorrow]].
b. John doesn't believe [that Mary has visited her [$_{NPI}$ in at least two years]].

Bošković observes that whether or not a language allows strict clause-mate NPI licensing under NR depends on whether it has articles. Thus, Serbo-Croatian (SC), Czech, Slovenian, Polish, Russian, Ukrainian, Turkish, Korean, and Japanese lack articles and disallow strict clause-mate NPI licensing under NR, while English, German, Spanish, French, Portuguese, Romanian, and Bulgarian have articles and allow strict clause-mate NPI licensing under NR, which leads to the generalization in (3)j. (Furthermore, Bošković and Gajewski (2011) demonstrate (3)j can be deduced under the DP/NP analysis given Gajewski's (2005) account of NPI licensing under NR. Note that the generalization does not concern lower clause negation interpretation, which is available even in article-less languages (Bošković 2008), it concerns only strict clause-mate NPI licensing.)

Bošković (2008) cites Chinese as another language that observes (3)j based on (8).

(8) *Yuehan bu/cai xiangxin Mali zhídào mingtian hui likai.
John NEG/until believe Mary until tomorrow will leave
'John didn't believe that Mary would leave until tomorrow.'

However, since the combination of *bu/cai…zhídào* does not function as the Mandarin counterpart of English *not…until*NPI, which interferes with the above test, we will discuss here another potentially relevant construction, noted by Roger Liao (p.c). Consider the following.

(9) Lisi zuotian *(meiyou) hua ban mao qian
Lisi yesterday NEG spend half cent money
'Lisi did not spend any money yesterday.'

(10) (*)Zhangsan meiyou renwei Lisi zuotian hua (le) ban mao qian
Zhangsan NEG think Lisi yesterday spend PERF half cent money
'Zhangan does not think that Lisi spent any money yesterday.'

(11) (*)Zhangsan meiyou shuo/xuancheng Lisi zuotian hua (le) ban mao qian
Zhangsan NEG say/claim Lisi yesterday spent PERF half cent money
'Zhangsan didn't say/claim that Lisi spent any money yesterday.'

The minimizer *ban mao qian* 'half cent' requires negation (9). There is, however, quite a bit of disagreement among our informants regarding the judgments for (10)/(11), where (10) involves a neg-raising predicate and (11) a non-neg-raising predicate. Our informants fall into two groups. For one group, both (10) and (11) are unacceptable. For these speakers, these examples confirm Chinese doesn't allow strict clause-mate NPI licensing under NR, in accordance with (3)j. Another group of speakers, however, finds both (10) and (11) acceptable. The judgments of these speakers have no relevance for the generalization in (3)j; the item in question is simply not a strict clause-mate NPI for them. We suggest these speakers treat *ban mao qian* as a weaker type of NPI than English strict NPIs such as *until* (for discussion that 'NPIs' vary in their licensing conditions, see Zwarts 1998). Note that, as (12) shows, for these speakers the *half*-phrase can be licensed by a negative quantifier in the matrix clause. (Speakers who find (10) and (11) unacceptable also find (12) unacceptable.) Importantly, as (13) shows, a negative quantifier cannot license a strict NPI in the complement of an NR predicate. This confirms that for the second group of speakers, the *half*-phrase is a weaker type of NPI than English strict clause-mate NPIs.[4]

[4] Alternatively, Yimei Xiang (p.c) notes, *meiyou* could be treated as neg+V, i.e., as 'not have'. The above conclusion would still go through given the impossibility of licensing strict clause-mate NPIs in negative existential sentences like **There isn't anyone thinking that John will come until tomorrow*. (Note, however, that *you* in *meiyou* is optional in simple negation contexts like (9) but obligatory in (12).)

Note that *renhe*, which corresponds to English *any,* is also irrelevant here, i.e. *renhe* is also weaker than English strong NPIs. Thus, *renhe* can be licensed in conditionals and the complement of non-NR verbs like *hear*, in contrast to strict clause-mate NPIs.

(i) Lisi meiyou tingshuo Zhangsan kanjian renhe ren.
Lisi NEG hear Zhangsan see RENHE people
'Lisi didn't hear that Zhangsan saw anyone.'

(ii) Ruguo Zhangsan kanjian renhe ren, ta hui mashang da-dianhua gei jingwei.
If Zhsangsan see RENHE people he would immediately call-phone to guard
'If Zhangsan sees anyone, he will call the guard.'

(12) Meiyou ren renwei Lisi zuotian hua (le) ban mao qian
none person think Lisi yesterday spent PERF half cent money
Intended reading: 'No one thinks that Lisi spent even a single cent yesterday.'

(13) a. */??Nobody thinks that John will come until tomorrow.
b. */??Nobody thinks that John has been in Boston in years.

3. On the binding properties of Chinese possessors

We now turn to binding properties of Chinese possessors. Bošković (2012) treats SC possessors and demonstratives as NP-adjuncts. One of the arguments for this analysis, noted by Despić (2011, 2013), is provided by (15), which contrasts with (14) in that the pronoun and the name cannot be co-indexed. Given that the possessor is an NP-adjunct and that SC lacks DP, the possessor c-commands out of the TNP, which results in Condition B/C violations in (15).[5]

(14) a. His$_i$ latest movie really disappointed Tarantino$_i$.
b. Tarantino$_i$'s latest movie really disappointed him$_i$.

(15) a. *[$_{NP}$ Kusturicin$_i$ [$_{NP}$ najnoviji film]] ga$_i$ je zaista razočarao.
Kusturica's latest movie him is really disappointed
'Kusturica$_i$'s latest movie really disappointed him$_i$.'
b. *[$_{NP}$ Njegov$_i$ [$_{NP}$ najnoviji film]] je zaista razočarao Kusturicu$_i$.
his latest movie is really disappointed Kusturica

Bošković (2012) observes Chinese and Japanese pattern with SC here, as (16) shows, and Bošković and Şener (in press) make the same observation for Turkish, which provides strong evidence for the no-DP analysis for these languages (for additional discussion of Chinese and Japanese, see Cheng (2013) and Takahashi (2011) respectively, see also Kang in preparation for Korean).[6]

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[5] As discussed in Bošković (2012), since contrastive focus affects binding relations it's important to control for it by using neutral (i.e. non-focused) intepretations of the relevant nouns/pronouns. Relational nouns like *father* also may involve irrelevant interfering factors (see Takahashi 2011 and footnote 7), hence they are avoided here. Note also that a multiple Spec analysis actually suffices to account for all the facts discussed in this paper (including word order facts from section 4) except the binding facts currently under discussion. It's not out of question that in some NP languages or for some speakers of Chinese possessors could be in SpecNP or even function as N-complements (like English *of*-genitives), in which case they would not c-command out of their TNP.

[6] The Condition B violation is observed even more obviously with quantificational expressions.

(i) *Meige-daoyan$_i$-de zuixinde dianying dou ciji le ta$_i$
every-director-GEN latest movie all provoke PERF him
'Every director$_i$'s latest movie provoked him$_i$.

(16) a. *Ta$_i$-de zuixinde dianying ciji le Li-An$_i$
he-GEN newest movie provoke PERF Li-An
'His$_i$ latest movie provoked Li-An$_i$.'

b. *Li-An$_i$-de zuixinde dianying ciji le ta$_i$
Li-An-GEN newest movie provoke PERF he
'Li-An's$_i$ latest movie really provoked him$_i$.'

c. ?*Kurosawa$_i$-no saisin-no eega-wa hontoo-ni kare$_i$-o
Kurosawa-GEN latest-GEN movie-TOP really him-ACC
rakutans-ase-ta.
disappoint-CAUSE-PAST
'Kurosawa's$_i$ latest movie really disappointed him$_i$.'

d. *Kare$_i$-no saisin-no eega-wa hontoo-ni Kurosawa$_i$-o
he-GEN latest-GEN movie-TOP really Kurosawa-ACC
rakutans-ase-ta.
disappoint-CAUSE-PAST
'His$_i$ latest movie really disappointed Kurosawa$_i$.'

The above analysis also enables us to shed new light on a well-known puzzle regarding Chinese anaphors. It's well-known Chinese possessors can bind anaphors outside of their TNP (there are interfering factors with the anaphor test in SC, see Despić (2011)).

(17) Li-An$_i$-de zuixinde dianying ciji le taziji$_i$
Li-An-GEN latest movie provoke PERF him-self
Intended reading: 'Li An$_i$'s latest movie really provokes himself$_i$.'

(17) can now be unified with (16)a–b: in both cases, due to the lack of the DP layer, the NP-adjoined possessor c-commands out of its TNP, which results in Condition B/C violations in (16) but the satisfaction of Condition A in (17).[7]

[7] There are cases where the possessor appears not to c-command *taziji* it binds in overt syntax, see Pan (1998). It's possible that such cases involve logophors or an additional LF movement; for discussion see Cole and Sung 1994; Cole et al. 2003; Huang and Tang 1991; Liu 1999; Pan 2001).

Note that for some speakers of SC, Japanese, and Turkish, the pattern from (16) changes with relational nouns, the Condition B/C effect being voided in examples like Japanese (i). Takahashi (2011) observes this for Japanese. (See Takahashi 2011 for discussion of other relevant factors. Thus, focus can affect even the basic paradigm from (15)–(16).)

(i) a. [Kare$_i$-no hahaoya]-ga John$_i$-o seme-ta (koto)
he$_i$-GEN mother-NOM John$_i$-ACC criticize-PAST fact
'His$_j$ mother criticized John$_j$.' (Hoji 1985: 7)

b. John$_i$-no sensei-ga kare$_i$-o bengosi-ta.
John$_i$-GEN teacher-NOM he$_i$-ACC defend-PAST
'John$_i$'s teacher defended him$_i$.' (Hoji 1990: 100)

To account for this, Takahashi follows an often-made claim that relational nouns such as "mother" and "teacher" take an argument to represent possessive relations (see e.g. Partee and Borshev 1998); in other words, with such nouns the possessor is an argument (Spec or complement, but crucially not an adjunct). As a result, the possessor does not c-command outside of its TNP

4. Word order in Chinese TNP

We now turn to word order within Chinese TNP. Bošković (2009a) observes word order within TNP is generally freer in NP than in DP languages. The reason for this is that the richer structural configuration of DP languages imposes syntactic restrictions on word order in DP languages that are not found in NP languages due to the lack of the syntactic structure in question. Thus, in English, demonstratives and possessives must precede adjectives because they are located in DP, which is higher than the projection where adjectives are located. In his discussion of SC, Bošković argues that due to the lack of DP all these elements are treated as NP adjuncts in SC. As a result, syntax does not impose any restrictions on the order of the elements in question: the only restrictions we may find come from the semantics.

Chinese strongly confirms this overall approach. As we will see below, any order of possessives, adjectives, and demonstratives is in principle allowed in Chinese, in stark contrast with English. This follows under Bošković's (2009a, 2012) analysis, where syntax doesn't impose any restrictions on the order of these elements in NP languages, due to a poorer structure of the TNP. There

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in (i). Significantly, it's well-known the possessor in such constructions in Chinese fails to c-command out with respect to Condition A, i.e. anaphor binding, as (ii) shows.

(ii) *Zhangsan-de mama piping le taziji
Zhangsan$_i$-GEN mom criticize PERF he-self
'Zhangsan$_i$'s mom criticized himself$_i$'.

In light of this, the ungrammaticality of (ii) may not be surprising. This discussion sheds new light on the well-known contrast between (17) and (ii). This contrast has been standardly treated as an animacy effect but has eluded a satisfactory explanation. The above discussion suggests it could be recast in different terms: whether or not the possessor is an adjunct or an argument. There is a problem, however. While there is speaker variation in SC, Japanese, and Turkish regarding examples like (i) with relational nouns (in contrast to non-relational noun examples like (15)), our Chinese informants reject its Chinese counterpart in (iii). Importantly, this also holds for those who reject (ii). (Due to the issue discussed in this footnote we will avoid testing binding with relational nouns in the text.)

(iii) a. *ta$_i$-de mama piping le Zhangsan$_i$
he-GEN mom criticize PERF Zhangsan
'His$_i$ mom criticized Zhangsan$_i$.'
b. *Zhangsan$_i$-de mama piping le ta$_i$
Zhangsan-GEN mom criticize PERF him
'Zhangsan$_i$'s mom criticized him$_i$.'

If the unacceptability of (iii) is taken to mean that the possessor c-commands out of the subject NP even in this type of examples, then an additional factor must be at work in (ii): there's apparently a preference (possibly due to some kind of relative prominence which is in fact also at work with multiple possessors) for the whole subject NP rather than the NP adjoined to it to serve as the binder. We leave it open here why this is the case. (For relevant discussion, see Pan (1998), Pollard and Xue (1998). Note that Pollard and Xue in fact question the animacy effect in general, providing cases where the effect is overriden by discourse/pragmatic factors, which may indicate the phenomenon in question is not relevant to our concerns here).

are, however, some interesting differences between Chinese and SC, both of which are NP languages. What's relevant here is that Bošković (2009a, 2012) argues that any order of the elements in question is in principle possible in the syntax of NP languages, but some word orders cause problems in the semantics.

Consider first SC. Bošković (2009a, 2012) demonstrates that the word order within SC TNP transparently reflects semantic composition, i.e. it follows from the semantics of the relevant elements. Thus, adjectives and possessors are freely ordered in SC, which follows from their semantics.

(18) Jovanova skupa slika vs. Skupa Jovanova slika
John's expensive picture

Given the standard assumption that both adjectives and possessors are of type <e, t>, compositional semantics doesn't impose any restrictions on the order in which the two are composed. This is also true of English. However, in English possessors still must precede adjectives for syntactic reasons, namely because they are located in DP, which is higher than the projection where adjectives are located. Since SC lacks DP, syntax doesn't impose any ordering restrictions on possessors and adjectives, hence we see here pure semantics at work: as a result, the two can occur in either order.

As noted above, Chinese provides rather strong confirmation for this particular argument for the NP analysis of article-less languages since, as expected under Bošković's argumentation, it has a rather free order of TNP elements. Thus, in Chinese, adjectives and possessors can also occur in either order, which is not surprising given the above discussion: this can be accounted for in the same way as the corresponding SC facts.

(19) Zhangsan-de hongsede chenshan vs. Hongsede Zhangsan-de chenshan
Zhangsan-GEN red shirt

Furthermore, an adjective that precedes a possessor doesn't confine the c-command domain of the possessor, as indicated by the Condition B/C violations in (20). This is not surprising given that both adjectives and possessors are NP-adjoined. SC behaves like Chinese in this respect, as discussed by Bošković (2012), Despić (2011, 2013), and illustrated in (21).

(20) a. *[$_{NP}$ zaoqide/daduoshude [$_{NP}$ Li-An$_i$-de [$_{NP}$ dianying]]] ciji le ta$_i$
early-time/most Li-An-GEN movie provoke PERF him
'Most/the early movies of Li-An$_i$'s provoked him$_i$.'

b. *[$_{NP}$ zaoqide/daduoshude [$_{NP}$ ta$_i$-de [$_{NP}$ dianying]]] ciji le Li-An$_i$
early-time/most he-GEN movie provoke PERF Li-An
'Most/the early movies of his$_i$ provoked Li-An$_i$.'

(21) a. *[$_{NP}$ Brojni [$_{NP}$ Kusturicini$_i$ [$_{NP}$ filmovi]]] su ga$_i$ razočarali
numerous Kusturica's movies are him disappointed

b. *[$_{NP}$ Brojni [$_{NP}$ njegovi$_i$ [$_{NP}$ filmovi]]] su razočarali Kusturicu$_i$
numerous his movies are disappointed Kusturica

Notice that the same holds regarding Condition A, which can be interpreted as providing additional evidence for a unified analysis of Condition A/B/C effects suggested above.

(22) [$_{NP}$ zaoqide/daduoshude [$_{NP}$ Li-An$_i$-de [$_{NP}$ dianying]]] ciji le ta-ziji$_i$
early-time/most Li-An-GEN movie provoke PERF him-self
'Most/the early movies of Li-An$_i$'s provoked himself$_i$.'

Returning to SC, in SC demonstratives must precede possessors and adjectives.

(23) a. ova skupa kola/?*skupa ova kola
this expensive car
b. ova Jovanova slika /?*Jovanova ova slika
this Jovan's picture

As discussed in Bošković (2009a, 2012), this is expected under the semantic account of word order restrictions in the SC TNP. Kaplan (1977/1989) argues demonstratives are markers of direct reference. In other words, demonstrative noun phrases pick out an individual of type e. The individual is picked out at least partially as a function of its predicate complement phrase. A demonstrative element like *that* is then a function of type <<e, t>, e>.

Once a demonstrative has mapped a nominal element to an individual, further modification by <e, t> type predicates is impossible. Hence, semantic composition requires both adjectives and possessives to be composed before demonstratives. In other words, it allows possessives to be composed either before or after modifying adjectives, while demonstratives must be composed after both adjectives and possessives.[8] This perfectly matches the actual facts regarding the ordering of these elements in SC.

Notice furthermore that a demonstrative that precedes a possessor does not confine the c-command domain of the possessor: such a possessor still c-commands out of its TNP, which provides strong evidence that a demonstrative that precedes a possessor is not located in a separate projection.

(24) a. *[$_{NP}$ Ovaj [$_{NP}$ Kusturicin$_i$ [$_{NP}$ najnoviji [$_{N'}$ film]]]] ga$_i$ je zaista razočarao.
this Kusturica's lates movie him is really disappointed
'This latest movie of Kusturica$_i$ really disappointed him$_i$.'

[8] This also holds for adjectives like *former*, which can be considered to be of type <<e, t>, <e, t>>. In fact, as Bošković (2012) notes, the account can be quite generally extended to non-restrictive adjectives under Morzycki (2008) (with some modifications), where non-restrictive adjectives are also treated as having type <e, t> .

b. *[$_{NP}$ Ovaj [$_{NP}$ njegov$_i$ [$_{NP}$ najnoviji [$_{N'}$ film]]]] je zaista razočarao
this his latest movie is really disappointed
Kusturicu$_i$.
Kusturica
'This latest movie of his$_i$ really disappointed Kusturica$_i$.'

All these facts follow straightforwardly if demonstratives, possessors, and adjectives are all NP-adjoined. We then account both for the fact that the only ordering restrictions that are found in this domain follow from semantics and the fact that demonstratives and adjectives that precede possessors do not confine the c-command domain of possessors.

As Bošković (2012) notes, demonstratives that precede possessors also fail to confine the c-command domain of possessors in Chinese, which provides evidence that the NP-adjunction analysis should also be applied to Chinese.[9]

(25) a. *Zhe-bu Li-An$_i$-de dianying ciji le ta$_i$
this-CL Li-An-GEN movie provoke PERF him
'This movie of Li-An$_i$ provoked him$_i$.'
b. *Zhe-bu ta$_i$-de dianying ciji le Li-An$_i$
this-CL he-GEN movie provoke PERF Li-An
'This movie of Li-An$_i$ provoked him$_i$.'

The same holds regarding Condition A effects, which can again be interpreted as providing evidence for a unified analysis of Condition A/B/C effects suggested above.

(26) Zhe-bu Li-An$_i$-de dianying ciji le ta-ziji$_i$
this-CL Li-An-GEN movie provoke PERF himself
'This movie of Li-An$_i$ provoked himself$_i$.'

However, while, as noted above, like SC, Chinese allows possessors and adjectives to occur in either order, Chinese is freer than SC with respect to TNP word order. Thus, possessors and adjectives are also allowed to precede a demonstrative.[10,11]

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[9] See Bošković (in preparation) for a more detail discussion of such constructions in Chinese. It is argued there that the classifier that occurs with a demonstrative is a different type of element from classifiers in other constructions; it doesn't project a separate phrase but is simply adjoined to the demonstrative.

[10] Note Chinese adjectives that precede demonstratives cannot be all analyzed as reduced relative clauses, see Aoun and Li (2003), Cheung (2005), del Gobbo (2004), Paul (2005), Sio (2006), Bošković and Hsieh (in preparation).

[11] Japanese and Korean pattern with Chinese in the relevant respect (in fact, they pattern with Chinese regarding all the binding/word order facts discussed so far). We give below the word order data.

(i) a. Taroo-no akai kuruma vs. akai Taroo-no kuruma
Taro-GEN red car

(27) a. na-bu hongsede paoche vs. hongsede na-bu paoche
that-CL red sport-car
b. na-bu Zhangsan-de che vs. Zhangsan-de na-bu che
that-CL Zhangsan-GEN car

We believe this provides strong confirmation of the no-DP analysis of Chinese, on which the elements in question are all NP-adjoined (recall DP languages impose stricter word ordering restrictions on TNP-internal elements due to the presence of DP). A question, however, still arises regarding how examples like (27), where a possessor/adjective precedes a demonstrative, can be interpreted. The problem is how to interpret a restrictive modifier that is syntactically realized outside of a demonstrative. The answer we will propose to this puzzle will unify this issue with another puzzling property of Chinese, which concerns the traditional plural marker *-men*.

5. The distribution of *-men* and a problem regarding NP modification

While Mandarin is usually seen as a language without a singular/plural distinction, the morpheme *-men* seems to play the same role as English plural *-s* (28).[12] As (29) shows, suffixing *-men* to common nouns in Mandarin gives rise to plural interpretation; however, unlike English *-s*, *-men* gives rise to definite interpretation; *xuesheng-men* refers to a unique group of students in the discourse context. (30) shows *-men* can be attached to pronouns and turn a singular pronoun into its plural counterpart.

(28) SG PL
student student-s
(29) xuesheng vs. xuesheng-men
student student-MEN
'the students'
(30) wo vs. wo-men
'I' I-men
'we'

b. sono akai kuruma vs. akai sono kuruma
that red car
c. Taroo-no sono kuruma vs. sono Taroo-no kuruma
Taro-GEN that car (Japanese)

(ii) a. Taroo-uy ppalkan cha vs. ppalkan Taroo-uy cha
Taro-GEN red car
b. ku ppalkan cha vs. ppalkan ku cha
that red car
c. Taroo-uy ku cha vs. ku Taroo-uy cha
Taroo-GEN that car (Korean)

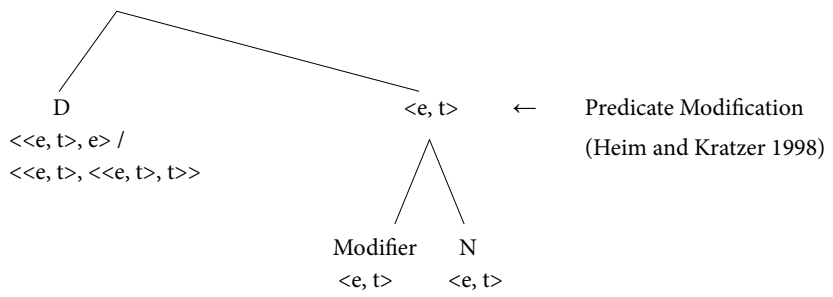
[12] For a more general recent discussion of plurality in Mandarin, see Zhang (in press).

(31)–(33) show common nouns suffixed with *-men* can be further modified by adjectives, relative clauses, and possessives.[13]

(31) congmingde xuesheng-men
smart student-MEN
'the smart students'
(32) wo renshi de laoshi-men
I know REL teacher-MEN
'the teachers I know'
(33) wo-de xuesheng-men
I-GEN students-MEN
'my students'

(31)–(33) pose a challenge to semantic composition. As noted above, attaching *-men* gives rise to definiteness; the problem is how to realize definiteness with a restrictive modification that is outside of the source of the definiteness. Modifiers such as intersective adjectives, relative clauses, and possessives are standardly treated as functions of type <e, t>. Partee (1976), Heim and Kratzer (1998), among others, have proposed that the semantic calculation of NPs with modification should be like (34). The modifier and the noun are first combined together. With the help of the rule Predicate Modification, we get a predicate of type <e, t>, which the determiner/quantifier applies on.

(34) e/<<e, t>, t>



This analysis runs into problems with (31)–(33). *-men* and the common noun seem to be combined together before the modifier comes in (see (35)a). However, if the source of the definiteness is *-men*, then the analysis in (34) cannot work, since at the surface *-men* is combined first with the common noun, not

[13] Regarding binding, it's hard to avoid using relational nouns with *-men* (since *-men* occurs only with human nouns), which involve an interfering factor (see footnote 7). In spite of that, examples like (i) are degraded, hence can receive the same treatment as similar examples discussed in the previous section.

(i) */? Weiruan$_i$-de jufaxuejia-men hui-le ta$_i$
Microsoft-GEN syntactician-MEN destroy-PERF it
'Microsoft$_i$'s syntacticians destroyed it$_i$.'

the modifier. In this respect, notice also (35)b: given that there is more than one group in contrast here, the modifiers preceding the TNPs with *-men* can only be interpreted as restrictive.

(35) a. [modifier [N-men]]

b. Zhe yi-ci quan san-nianji-de gechang-bisai,
this one-time all three-graders-GEN singing-contest
he Lisi-de xuesheng-men biqilai, Zhangsan-de xuesheng-men biaoxian
and Lisi-GEN student-MEN compare Zhangsan-GEN student-MEN perform
feichang youyi
very excellent
'In the singing contest for the 3-graders this time, compared to Lisi's students, Zhangsan's students performed excellently.'

This problem is reminiscent of the issues regarding (27), where a possessor/adjective precede a demonstrative; i.e., an analysis along the lines of Partee (1976), Heim and Kratzer (1998) also runs into problems with (27). Here, the demonstrative and the noun seem to be combined before the adjective and the possessor come in. However, as discussed above, once the demonstrative and the noun are composed, further modification by predicates of type <e, t> is no longer possible.

The composition problem has actually been already noted and analyzed regarding relatives. Like possessors and adjectives, relative clauses can also occur either before or after demonstratives, i.e. the demonstrative-numeral-classifier (DNC) sequence. Lin (2003) shows both pre-DNC and post-DNC relative clauses are restrictive. The analysis in (34) hence runs into difficulty as well when deriving the interpretation of (36)b, where the relative clause occurs before the DNC sequence.

(36) a. na-ge dai yanjing de xuesheng
that-CL wear glasses REL student
'that student who wears glasses'

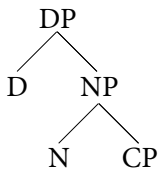
b. dai yanjing de na-ge xuesheng
wear glasses REL that-CL student
'that student who wears glasses'

Lin (2003) proposes a semantics for (36)b that is built on an idea by Bach and Cooper (1978). We will show that his analysis can be applied to (31)–(33) and (27). Bach and Cooper's (1978) and Lin's (2003) proposals are summarized in the next section.

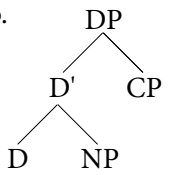
6. Bach and Cooper (1978) and Lin (2003)

Partee (1976) argues the structure in (37)a is more appropriate for restrictive relatives than (37)b in that (37)a provides a better match between syntax and semantics for complex NPs with restrictive relatives. In (37)a, the head noun and the relative clause are combined and serve together as the restrictor of the determiner, which can be a definite article or a quantifier. On the other hand, it is not straightforward for the relative clause to be accommodated as part of the restrictor of the determiner in (37)b.

(37) a.



b.



However, this claim was challenged by cross-linguistic data. Bach and Cooper (1978) provide an example from Hittite and show that it is not possible to assign a structure like (37)a to (38).

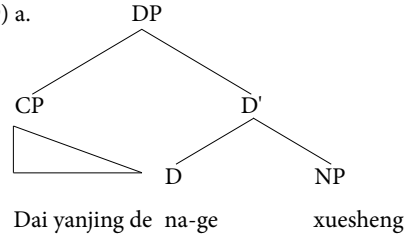
(38) *ŠA* NA$_4$.HI.A.-ia kuieš GUNNI.MEŠ nu kuišša 1 GÌN
GEN stone-PL -and which hearth-PL PTC each(one) 1 shekel
'And every hearth which is made of stones costs 1 shekel.'

They further suggest a semantics that goes well with the structure of (38), which they argue is (37)b. In their analysis, a free variable is built into the semantics of determiners/quantifiers; the relative clause, which is added to the structure after the determiner and the noun are combined, specifies the value of this free variable. Building on this, Lin (2003) shows the pre-DNC relative clause like (36)b can be analyzed as in (39).[14] In Lin's analysis, a demonstrative NP *that N* is treated as a generalized quantifier. The free function variable *h* in the denotation of the determiner carries the same function as that of a contextual pronominal variable (von Fintel 1994; Marti 2003a, b); while the value of

[14] Lin (2003) claims that both pre- and post-demonstrative relative clauses in Mandarin should be analyzed as restrictive; appositive relative clauses are only possible when the head of the complex NP is a proper name or a pronoun (for relevant discussion of Chinese relatives, see Huang 1982, Lin 1997, Zhang 2001, Del Gobbo 2001, among others). Notice that Lin (2003) assumes DP for Chinese, but his analysis can be easily adapted to the no-DP approach.

the contextual variable is usually specified by the context, it can also be specified explicitly by other constituents in syntax. In (39), the free variable $h_{<e, t>}$ receives its value from the pre-DNC relative clause, whose type is also <e, t> (we have modified slightly Lin's formalization).

(39) a.



b. [[NP]] = λx. x is a student
[[D]] = $\lambda f_{<e, t>}$. $\lambda g_{<e, t>}$. [f(THAT x) = 1 and **h(THAT x)** = 1] and g(THAT x) = 1
[[D']] = $\lambda g_{<e, t>}$. [THAT x is a student and **h(THAT x)** = 1] and g(THAT x) = 1
[[CP]] = λx. x wears glasses
[[DP]] = $\lambda g_{<e, t>}$. [THAT x is a student and THAT x wears glasses] and g(THAT x) = 1

Note that analyses where a free contextual (function) variable receives a value specified by a syntactic constituent have been appealed to in other cases as well. Thus, assuming modals quantify over possible worlds, Kratzer (1977) notes that the domain of a modal quantifier can be restricted by variables whose value can be specified by an adverbial phrase. In (40), *in view of…* serves to explicitly specify the set of worlds the modal quantifies over (what kind of worlds are relevant to the quantification of the modal). Another example involves superlatives (see e.g., Heim 1999). The interpretation of superlatives is highly contextually dependent; in (41), *among…* serves to specify the context where the comparison takes place. In these examples, while the adverbials occur outside of the scope of the modals/superlatives, semantically they are interpreted as part of the restrictor of these elements.

(40) In view of the laws of Connecticut, John may not buy alcohol after 9 p.m.
(41) Among the three people in front of me, John is the tallest.

7. Resolving the semantic composition issue

7.1. Pre-demonstrative modification

Returning to (27), Lin's analysis of (36)b can be easily extended to (27).[15] Possessors and intersective adjectives can be treated just like relative clauses,

[15] An analysis of the adjective-demonstrative order along these lines (i.e. an analysis that employs a contextual variable) was actually proposed in Williams (2002). While we will be following here Williams's insight, our implementation of the contextual variable analysis will be different.

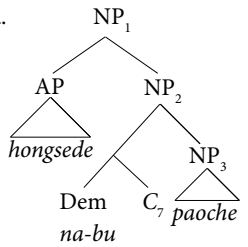
which means Lin's analysis of (36)b (see (39)) can be straightforwardly extended to (27): given that both possessive expressions and intersective adjectives are of type <e, t>, they can also serve to provide a value for the contextual pronominal variable that further restricts the domain of quantification. We thus have an account for the fact that possessors, intersective adjectives, and relative clauses can all precede demonstratives in Chinese.

(27) a. na-bu hongsede paoche vs. hongsede na-bu paoche
that-CL red sport-car

b. na-bu Zhangsan-de che vs. Zhangsan-de na-bu che
that-CL Zhangsan-GEN car

While we will apply Lin's (2003) analysis to these cases, slight modifications will be made without leading to different predictions. We assume demonstrative *na*-CL is a function of type <<e, t>, <<e, t>, e>>>, which maps a pair of functions of type <e, t> to an individual. The first argument of the demonstrative *na*-CL is saturated by a contextually provided variable, the purpose of which is to render the demonstrative operate on a contextually salient domain. We further assume the contextual variable behaves like a pronominal element and receives its value from a contextually provided assignment function g. The semantic composition of the TNP with a demonstrative following an adjective, as in (27)a, is given in (42): the pre-demonstrative modifier *hongsede* specifies the value of the variable assignment g(7). Through the variable assignment g(7) that is built into the denotation of the demonstrative, the pre-demonstrative modifier can serve to restrict the demonstrative.[16]

(42) a.



Thus, while in Williams's formalization modifiers that precede demonstratives are the first arguments of the demonstrative, in the analysis given below the first argument of the demonstrative is a contextual pronominal variable and the denotation of pre-demonstrative modifiers does not directly interact with the demonstrative. (Note, however, that we pursue an alternative analysis of the constructions under consideration in Bošković and Hsieh in preparation).

[16] Note two adjectives can precede a demonstrative.

(i) melide qinqiede na-ge nuhai
beautiful kind that-CL girl
'that beautiful kind girl'

The most natural treatment of such cases in the current system would intersect the denotation of the modifiers outside of the demonstrative, and then have the contextual variable receive the intersection of the denotation of these two modifiers as its value.

b. [[NP3]] = λx. x is a sports car
[[*na-bu*]] = $\lambda h_{<e, t>}$. $\lambda f_{<e, t>}$. THAT individual x such that h(x)=1 and f(x)=1
$[[C_7]]^{c, g}$ = g(7)
(where h is an assignment function from indices to functions of type <e, t>, which is provided by the discourse context c)
[[*honghsede*]] = λx. x is red
$[[\text{NP2}]]^{c, g}$ = [[*na-bu*]] ($[[C_1]]^{c, g}$) ([[*honghsede*]])
= THAT individual x such that g(7)(x)=1 and x is a sports car
$[[\text{NP1}]]^{c, g}$ = THAT individual x such that x is red and x is a sports car
(where $g^{[7 \to \lambda x.\ x \text{ is red}]}$; Assignment Modification)

Possessives like *Zhangsan-de* 'Zhangsan's', are taken to be of type <e, t> (Partee and Borschev 1998, among others). Here we assume the possessive has the denotation in (43); the analysis in (42) can then be easily applied to TNPs with pre-demonstrative possessives.

(43) [[*Zhangsan-de*]] = λx. x belongs to Zhangsan

The contextual pronominal variable analysis should not be freely (i.e. as freely as in Chinese) available for SC demonstratives; otherwise possessors and adjectives could precede demonstratives in SC too. While noting that whether an element introduces a contextual variable depends on its lexical semantics and that the range of lexical variation can be pretty wide, we will also offer a suggestion that the presence of a classifier on the demonstrative in Chinese may matter here.[17]

Consider the issue in a bit more detail. The analysis given above for Chinese crucially relies on the contextual pronominal variable in the semantics of NPs with demonstratives. Having the contextual variable visible in the syntax, this analysis enables modifiers that are hanging outside of the scope of a demonstrative to serve as part of the restrictor of the demonstrative by having the contextual pronominal variable receiving its value from the modifier (or, in (42), receiving the value from the modifier through the mediation of the assignment function applying on the index on the variable).

(44) Chinese: $[_{\text{NP}}$ modifier$_1$ $[_{\text{NP}}$ Dem-C_1 [N]]]

An implicit assumption is that the contextual variable/restriction of the demonstrative has to be syntactically visible (at least in LF). Assuming the syntactic structures we gave serve as the input for semantic composition, only

[17] We are dealing here with a very interesting issue of semantic crosslinguistic variation. In this particular instance the variation is lexical. Obviously, the lexical properties of the element under consideration, the demonstrative (in Chinese vs. SC), are relevant here. Note also that Martí (2003b) suggests that the different behavior of contextual pronominal variables across languages could be linked to the lexical properties of pronouns in the language (see also Bošković and Hsieh in preparation for an alternative view where the source of the different behavior of Chinese and SC regarding TNP word order lies in certain differences in type-shifting/semantic types).

when the contextual variable is visible in the syntax can it be specified by a pre-demonstrative modifier and hence further restrict the demonstrative non-vacuously.

With this in mind, the fact that in SC, modifiers cannot precede demonstratives can be captured by the assumption that the contextual restriction of SC demonstratives is not syntactically visible (as a variable or as an index on the demonstrative). Given that a syntactically visible contextual pronominal variable is not available in SC demonstratives, a modifier that hangs outside of the demonstrative cannot be interpreted as part of the restrictor of the demonstrative ((46)a). Hence, the only way to interpret a modifier is to have it adjoin under the demonstrative ((46)b). The alternative, which has the same result, is to assume that there is no contextual pronominal variable in the denotation of SC determiners. (The denotation in (45) may be assigned to the SC demonstrative 'that'.)

(45) $[\![\text{SC-that}]\!]^c = \lambda f_{<e,t>}$. THAT x such that x is salient on the discourse context c and f(x)=1

(46) SC: a. $*[_{NP}$ modifier $[_{NP}$ Dem [N]]] → the modifier cannot be interpreted inside Dem, hence cannot restrict Dem

b. $[_{NP}$ Dem $[_{NP}$ modifier $[_{NP}$ N]]

We speculate that the different behavior of Chinese and SC demonstratives regarding the issue under consideration may be related to the presence of a classifier on the demonstrative in Chinese. One possibility is that the classifier that comes with a demonstrative (see here footnote 9) is a realization of this syntactically visible contextual restriction (see also Martí 2003b for independent evidence that contextual pronominal variables are syntactically active in Chinese).[18]

Summing up, radically different behavior of article-less languages like SC and Chinese and article languages like English regarding the freedom of word order and binding possibilities within TNPs provides rather strong evidence for the NP/DP analysis and shows that a uniform analysis for all these languages is simply not empirically warranted. The NP analysis accounts not only for the different behavior of NP and DP languages in the relevant respects, but also for the remaining difference between Chinese and SC regarding the ordering of TNP-internal elements concerning demonstratives, tying it to an independent factor.

[18] Japanese and Korean, also classifier languages which behave like Chinese in the possibility of placing modifiers outside the scope of demonstratives, would then have a null classifier co-occurring with a demonstrative (recall such classifiers are different from those that co-occur with numerals, which are obligatory). The most natural interpretation of our analysis is then that modifiers will be able to occur outside of the scope of demonstratives only in languages with classifiers (given that, as Cheng 2013 shows, true classifier systems are restricted to NP languages, this means that this would be a possibility only in the subset of NP languages.

7.2. TNPs with *-men*

We now turn to Chinese *-men*. The proposal made in Lin (2003) and Bach and Cooper (1978) can also be applied to the data in (31)–(33): under the assumption that *-men* introduces a free variable that receives its specification from a modifier that is syntactically located outside of the combination of the common noun and *-men*, the modifier may serve to restrict the quantificational domain of *-men*.

Consider the details of the analysis. First we assume *-men* denotes a function that maps a property of type <e, t> to plural individuals. Just like the demonstrative in (42), *-men* maps to an individual a pair of functions of type <e, t>, and the first argument of *-men* is saturated by a contextually provided pronominal variable. The (preliminary) denotation of *-men* is given in (47).

(47) $[\![\textit{-men}]\!]^{c, g} = \lambda h_{<e, t>}. \lambda f_{<e, t>}.$ the unique plural individual X such that, for all $x \in X$, $h(x)=1$ and $f(x)=1$

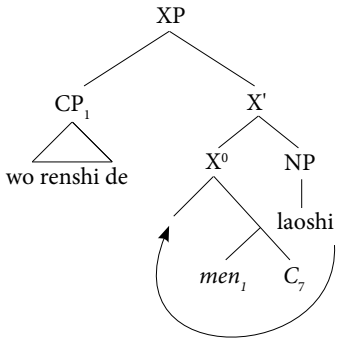
By building into the semantics of *-men* a function whose value is determined by the discourse context, we can take the modifiers in (31)–(33) to be a specification of the value of this free variable. Take (32)a for instance; assuming (48)a is the LF for (32)a, the semantic composition of (32)a is given in (48)b.[19] In the following, we treat N-*men* as denoting a unique group in the discourse (i.e. a plural individual; see e.g., Link 1983; Schwarzchild 1996); hence, a TNP with *-men* is of type e. Following approaches that assume head movement of the noun in such constructions (see e.g., Li 1999), we assume the noun *laoshi* adjoins to Cl^0, which also ends up providing a host for *-men*, satisfying the affixal nature of *-men*.[20]

[19] In (48), we remain agnostic regarding the grammatical category of *-men*, returning to the issue below.

[20] Alternatively, the movement in question may involve NP movement to SpecXP, which could explain why nothing may follow the N-*men* sequence. It's, however, possible that structures where something would follow the N-*men* sequence as a result of the N-to-*men* movement are filtered out in PF due to the N-final nature of Chinese NPs; see Şener (2010) for an approach to word order where such considerations hold in PF.

Another possibility, which may in fact be preferred to the movement analysis given in the text, is that *-men* undergoes affix hopping in PF to the noun, which remains in situ. Elements that could be in principle generated in between *-men* and the noun would then have to be generated higher up in order not to block affix hopping (see Bošković 2004 for evidence that even adjuncts block affix hopping).

(48) a.



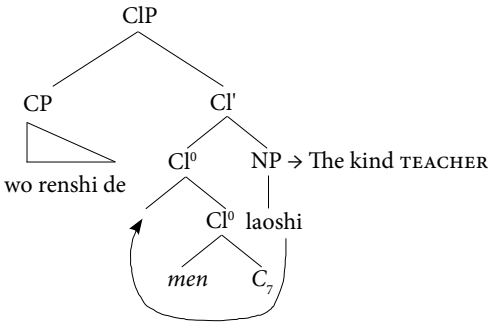
b. [[NP]] = λx. x is a teacher
[[-*men*]] = $\lambda h_{<e, t>}.\lambda f_{<e, t>}$. the unique plural individual X such that, for all x∈ X, h(x) = 1 and f(x) = 1
$[[C_7]]^{c, g}$ = g(7)
(where g is an assignment function from indices to functions of type <e, t>, which is provided by the discourse context c)
$[[X']]^{c, g}$ = $[[\text{-men}]]^{c, g}([[C_7]]^{c, g})([[NP]])$
= the unique X such that, for all x∈ X, g(7)(x) = 1 and x is a teacher
[[CP]] = λx_e. I know x
[[XP]] = the unique X such that, for all x∈ X, x is a teacher and I know x
(Assignment Modification, $g^{[7 \to \lambda x.\ I\ know\ x]}$)

The first argument of *-men* is saturated by a contextual pronominal variable, which receives its value by the contextually supplied assignment function and provides a further restriction on the quantificational domain of *-men*. The relative clause then specifies the value of g(7) through the modification of the value that the assignment function g assigns to the contextual pronominal variable (Assignment Modification; Heim and Kratzer 1998). While the relative clause adjoins outside of the plural noun phrase, semantically it's interpreted within the scope of the plural morpheme *-men*. Pre-nominal adjectives/possessors like (31) and (33) can be treated in the same way.

Chierchia (1998) proposes bare nouns in Mandarin are kind-denoting and of type e. To incorporate Chierchia's proposal regarding the semantics of common nouns in Mandarin, we may assume *-men* takes a non-atomic individual, including a kind-denoting individual as its second argument and returns a unique contextually salient plural individual whose atomic parts are also part of the denotation of its second argument (49). The structure and the semantics of the definite plural NP formed by the attachment of *-men* given in (48) can be further implemented as in (50), which also incorporates a particular proposal regarding the structural position of *-men*.

(49) [[-*men*]] = $\lambda h_{<e, t>}.\ \lambda k_e$: k is not atomic. the unique plural individual X such that, for all x∈ X, h(x) = 1 and x≤k

(50) a.



b. $[\![\text{NP}]\!] = \textit{TEACHER}_k$
$[\![\text{X'}]\!]^{c, g} = [\![\text{-men}]\!]^{c, g}([\![C_7]\!]^{c, g})([\![\text{NP}]\!])$
$= \text{the unique X such that and for all } x \in X, g(7)(x) = 1 \text{ and } x \leq \textit{TEACHER}_k$
$[\![\text{CP}]\!] = \lambda x.$ I know x
$[\![\text{XP}]\!] =$ the unique X such that for all $x \in X$, I know x and x is a teacher
(Assignment Modification, $g^{[7 \to \lambda x. \text{ I know x}]}$)

We have been vague regarding the syntactic category of *-men*. Following broadly the spirit of Borer (2005), it is plausible that *-men* is base-generated under Cl^0, as in (50). This explains why TNPs with *-men* are incompatible with a numeral-classifier sequence, i.e. this accounts for the ungrammaticality of (51), where *-men* and classifier *ge* co-occur.[21] As noted below, this may also explain the definiteness of *-men* NPs. Note that in the analysis suggested

[21] The no-DP analysis doesn't require all functional projections to be missing from the Chinese TNP. In fact, working within a no-DP system, Bošković (2012), Cheng (2013), Takahashi (2011) argue that an additional projection, which for ease of exposition we refer to as ClP, is present above NP in Chinese numeral+classifier constructions (see Bošković 2012, in press and Despić 2011, 2013 for evidence that an additional projection is present above NP in SC numeral constructions); Bošković (in preparation) argues this has to do with number (i.e. number/numerals are the source of the additional projection) given that SC numerals don't co-occur with classifiers and given that classifiers that co-occur with demonstratives in Chinese don't bring in an additional projection, as noted in section 4 (see especially (25)–(26) and footnote 9). Still, we refer to the projection in question as ClP for expository reasons. Note also we assume that when ClP is present, elements that are normally adjoined to NP are (or can be) adjoined to ClP (see Takahashi 2011, Bošković in press for relevant discussion of Japanese particles). Note in this respect that the possessor in (i) induces a binding violation, which indicates it is TNP-adjoined (i.e. ClP-adjoined, given that the presence of *-men* and num+cl indicates the presence of ClP).

(i) a. *Ta_i-de jufaxuejia-men hui le Weiruan_i
it-GEN syntactician-MEN destroy PERF Microsoft
'Its_i syntacticians destroyed Microsoft_i.'

b. *Ta_i-de san bu jinqide dianying ciji-le Li-An_i
he-GEN three CL recent movie provoke-PERF Li-An
'His_i three recent movies provoked Li-An_i.'

c. ?*Weiruan_i-de jufaxuejia-men hui-le ta_i
Microsoft-GEN syntactician-MEN destroy-PERF it
'Microsoft_i's syntacticians destroyed it_i.'

above, *-men* and classifiers share some properties: both of them may operate on a kind-denoting individual. The main difference between a classifier and *-men* is that *-men*, but not the classifier, further selects the maximal realization of the kind-denoting individual in question in the discourse context.

(51) a. *san ge xuesheng-men b. *xuesheng-men san ge
three CL student-MEN

It's worth noting that the above analysis fits well with the spirit of Cheng and Sybesma's (1999) claim that in Chinese, the information regarding definiteness is syntactically localized in the classifier projection.[22] In particular, Cheng and Sybesma argue that classifiers in Chinese play the deictic function and that ClP is the source of definiteness. The analysis suggested in (50) is consistent with the spirit of their claim given that *-men* is base-generated under CL^0, hence the source of definiteness in a *-men* NP can be taken to be the projection of the classifier.[23] Note also that while the modifier in (50) adjoins above *-men*, it is interpreted as the restrictor of *-men*, since it provides the value for the contextually determined property that is intersected with the derived predicate from the complement NP of *-men*. In fact, this can be interpreted as an additional argument for the classifier status of *-men*, given that we have tied the possibility of a contextual pronominal variable in the denotation of demonstratives to classifiers.[24]

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d. *Li-An$_i$-de san bu jinqide dianying ciji-le ta$_i$
Li-An-GEN three CL recent movie provoke-PERF him
'Li-An's$_i$ three recent movies provoked him$_i$.'

[22] There is another possibility under the Cheng and Sybesma's (1999) approach where definiteness is encoded by classifiers: If *-men* is higher than classifiers, the presence of *-men* may entail the presence of the (now null) classifier, the locus of definiteness. We put this possibility aside here, adopting the *-men*-as-a-classifier analysis in the text. The reader should, however, also bear in mind that the current analysis does not depend on treating *-men* as a classifier.

[23] For Cheng and Sybesma, addition of a NumP on top of ClP basically undoes the definiteness of ClP. Adopting this into the current analysis would entail that there is no NumP on top of ClP in the case of *-men*, *-men* is basically a conflated Num and Cl (on conflated Num/Cl (though in a different context), see Tang 1990; for relevant discussion see also Borer 2005).

[24] Our preliminary investigation indicates that it may be harder for non-intersective adjectives (though not all of them) to precede a demonstrative. Under our analysis, some assumptions are needed to prevent *keyide* from being interpreted inside the demonstrative in (ib). (However, *na-ge* 'that' and *-men* then need to be treated differently so that (ic) is not wrongly excluded; we leave the issue open). E.g., we could assume that non-restrictive adjectives are not of type <e, t> (they could be of type <<e, t>, <e, t>>), hence could not be interpreted via the contextual variable. Or we could require that the extension of the contextual variable be intersected with something else, e.g. the noun. Non-restrictive adjectives then could not be interpreted via the contextual variable.

(i) a. na-ge keyide xuesheng
that-CL questionable student
'that questionable student'

b. ??/*keyide na-ge xuesheng
questionable that-CL student

7.3. Pronouns and *-men*

Recall *-men* can be attached to singular pronouns to form their plural counterparts.

(52) a. wo vs. wo-men
'I' I-men
'we'

b. ni vs. ni-men
'you' you-MEN
'you (pl.)'

c. ta vs. ta-men
'he/she' he/she-MEN
'they'

(53) shows it is possible to modify a plural pronoun that is formed by attaching *-men*.

(53) a. congming de ni-men ziji xiang banfa jiejue ba!
smart DE you-MEN yourselves think ways solve EXCL
'you smart people think of a way to solve it yourselves.'

b. xinku de ta-men cai ganggang ba fangjian qingliganjing
hard-working DE he-MEN until just do room clean
'they hardworking people just finished cleaning the rooms.'

As observed by Li (1999), among others, a numeral-classifier sequence can co-occur with a plural pronoun (i.e. pronoun-*men*) in the post-nominal position (54). (55) shows a common noun can follow the pronoun-*men*-num-Cl sequence.

(54) wo-men/ni-men/ta-men san ge
I-MEN/you-MEN/he.MEN three CL
'we/you(pl.)/they three'

(55) ta-men san ge xuesheng
he-MEN three CL student
'they three students'

---

c. keyide xuesheng-men
questionable student-MEN
'the questionable students'

Interestingly, an adjective like *hongsede* 'red' that otherwise can precede a demonstrative but normally follows *keyide* cannot precede a demonstrative when *keyide* is present. This follows from the current analysis under an approach like Bošković (2013), where adjectival ordering follows from semantic considerations (*hongsede* then must be interpreted in the scope of *keyide*).

(ii) a. na-bu keyide hongsede paoche
that-CL questionable red sport-car
b. ?*na-bu hongsede keyide paoche
c. *hongsede na-bu keyide paoche

Note only plural pronouns can co-occur with a num-Cl sequence; as noted in section 7.2, plural NPs that are composed of bare nouns and *-men* cannot co-occur with a post-nominal num-Cl sequence.

(56) *xueshen-men san ge
student-MEN three CL
Intended reading: 'the three students'

There is another difference between plural pronouns and plural NPs formed by the affixation of *-men:* while, as discussed above, in the case of plural NPs a pre-nominal modifier can be either restrictive or non-restrictive, it can only be non-restrictive in the case of plural pronouns. The plural pronoun in (57) means (58)b, not (58)a.

(57) congming de ni-men ziji xiang banfa jiejue ba!
smart DE you-MEN yourselves think ways solve EXCL
'You smart people think of a way to solve it yourselves.'

(58) a. those among you guys who are smart
b. you people, who are smart

It has been reported (Li 1999; Cheng and Sysbesma 1999) that *-men* can be attached to proper names, as in (59); the combination of proper names and *-men* in (59) refers to a group of people that includes a person with the name *Xiaoqiang*. It should be noted, however, that examples like (59) are rejected by many speakers.[25]

(59) Xiaoqiang-men
Xiaoqiang-MEN
Intended reading: 'a group of people where Xiaoqiang is included'

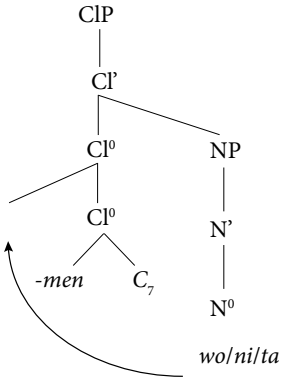
The morphology-syntax-semantics of (plural) pronouns is still a debated issue (see e.g., Kratzer 2009; Corbette 2000). Here we simply suggest an analysis of plural pronouns that is consistent with the syntax and semantics of *-men* proposed above. The suggested syntax of Mandarin plural pronouns is given in (60). *-men* heads a classifier projection; the complement of *-men* is an NP that is headed by a singular pronoun. The pronoun moves, adjoining to *-men*.[26] Furthermore, as with plural NPs, *-men* occurs with a contextual pronominal

[25] There may thus be some speaker variation here. As noted above, many speakers find proper name+*men* sequences ungrammatical; to the extent that such sequences are acceptable for them they are possible only if *Xiaoqiang-men* refers to a group of people all of whom have the same name, namely 'Xiaoqiang' (in fact, Li 1999 observes the same holds for most of her informants). To express the meaning given in (59), our informants generally use: *Xiaoqiang ta-men* (lit. *Xiaoqiang they*–meaning 'they, and Xiaoqiang is included in that group'; see also Li 1999).

[26] Bošković (2008), Despić (2011: chapter 4), Fukui (1988), and Runić (in press a, b) provide a number of arguments that even pronouns are Ns/NPs in NP languages.

variable, which receives its value from a contextually provided assignment function and serves to saturate the first argument of *-men*.

(60)



Singular pronouns like *I, you*, and *he/she* are individual-denoting and are interpreted relative to the context; e.g., the pronoun *I* refers to the individual who is the speaker in the discourse context (61). Following the semantics of *-men* in (49), *-men* takes a plural individual, not an atomic individual, as its second argument. To resolve the type mismatch, we suggest a lexical rule in (62), which turns the denotation of singular pronouns into a plural individual.[27] Based on (62), with the second meaning, the pronouns like *wo*, *ni*, and *ta* denote a unique plural individual in the discourse context that contains the extension of the singular pronouns based on their first meaning. E.g., the second meaning of the first person *wo* is the unique group of individuals that includes the speaker; that of the second person *ni* is the unique group of individuals in the discourse context that contains the addressee. Based on the syntax in (60), *-men* then applies on the second meaning of the pronoun and gives a plural individual that is composed of the atomic parts of the plural individuals denoted by the pronoun with its second meaning.

(61) $[\![\text{wo}]\!]^{g,c}$ = speaker in c
$[\![\text{ni}]\!]^{g,c}$ = addressee in c
$[\![\text{ta}]\!]^{g,c}$ = a unique individual in c that is neither the speaker nor the addressee

(62) For the pronouns *wo*/*ni*/*ta*, the 2nd meaning $\pi([\![\text{wo/ni/ta}]\!]^{g,c})$ is defined as the following:
$\pi([\![\text{wo/ni/ta}]\!]^{g,c})$ = the unique group of individuals X s.t X includes the speaker/hearer/a third person other than the speaker or the hearer

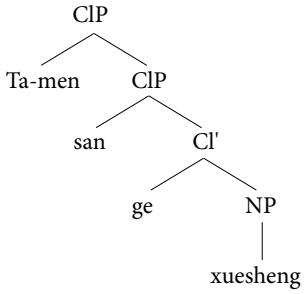
[27] This lexical rule for Mandarin pronouns may be seen as a type-shifting operator. The idea of postulating a lexical rule to solve a type mismatch has been pursued elsewhere. Thus, Schwarzchild (2005) suggests a lexical rule for gradable adjectives (of type <d, <e, t>>) that relates individuals to degrees so that a gradable adjectives may also relate individuals to sets of degrees (i.e. intervals).

(63) $[\![\text{-}men_1]\!]^{g,c}([\![C_7]\!])(\pi([\![$wo/ni/ta$]\!]^{g,c})$ = the unique set of individuals X s.t for all x∈ X, g(7)(x) = 1 and x is part of the unique group of individuals X s.t X includes the speaker/hearer/ a third person other than the speaker or the hearer

The accessibility of a lexical item to the lexical rule in (62) should be seen as a lexical property; based on (62), the rule only applies to pronouns but not other expressions. The variation among speakers regarding (59), a proper name combined with *-men*, then may be cashed out by assuming that for some speakers, rule (62) is extended to proper names.

As for the compatibility of plural pronouns with numeral-classifier sequences, illustrated by (54)/(55), we suggest that cases of this kind involve a structure like (64)a and that the plural pronoun performs a deictic function here. Cases like (54) and (55) can then be taken to be parallel with those of demonstrative NPs like (64)b.[28]

(64) a.



b. zhe san ge xuesheng
this three CL student
'these three students'
[$_{ClP}$ zhe [$_{ClP}$ san [$_{Cl'}$ ge [$_{NP}$ xuesheng]]]]

One question that has remained unanswered so far is why, in contrast to pronoun-*men* sequences, N-*men* sequences cannot co-occur with a post-nominal numeral classifier, as (56) shows. While we do not have a fully worked out answer to this puzzle, we note here that treating the plural pronoun *ta-men* in (64)a as a demonstrative-like element opens up the possibility of making a parallel between the contrast in (54)/(55) and (56) and the contrast in English (65). Both plural pronouns and definite plurals refer to a unique group in the discourse; however, as (65) shows, while a plural pronoun in English may act like a demonstrative and carry out a deictic function ((65)a), this is not the case with definite plural NPs ((65)b). With the assumption that the plural pronouns in (54)–(55) function like a demonstrative, it seems safe to assume that an account that will explain the contrast in (65) will also account for the fact

[28] As an illustration that parallelism is warranted here, note nothing can intervene between *ta-men*/demonstrative and the numeral here (for an account, see Bošković in preparation).

that Chinese nouns with *-men*, unlike *-men* pronouns, cannot co-occur with a post-nominal numeral-classifier sequence.

(65) a. We/you/they (three) linguists will have a meeting today.
b. *The professors (three) linguists will have a meeting today.

An alternative that can be pursued to account for the contrast between Ns with *-men* and pronouns with *-men* regarding their compatibility with post-nominal num-cl sequences is to appeal to Lin's (2003) generalization regarding the distribution of appositive relative clauses in Chinese. Lin (2003) notes that appositive relative clauses are only possible when they characterize a more or less permanent property and the head noun they modify is a pronoun or a proper name. Hence, if we assume that the numeral-classifier(-noun) sequence is appositive, then the incompatibility of common nouns with *-men* and post numeral-classifier(-noun) sequences follows: since common nouns cannot occur with appositives, they cannot co-occur with post numeral-classifier(-noun) sequences, in contrast to pronouns and proper names, which are compatible with appositives (see also here the discussion of (58)).

8. The NP/DP parameter and the number--definiteness interaction in Mandarin

As far as we know, there is no DP-language that has the interaction of number and definiteness of the kind Mandarin has. When attached to common nouns *-men* semantically carries two functions; it introduces not only plurality but also definiteness (maximality). As a result, a noun suffixed with *-men* is interpreted as a definite plural. In a DP-language, the labor that is done by *-men* in Mandarin is divided between D^0 and the head of the number projection Num^0; D^0 introduces definiteness and Num^0 introduces plurality. Since NP languages do not have a projection like DP that is dedicated to introducing definiteness, other functional elements such as Cl^0/Num^0 have to take over the function of introducing definiteness. As a result, NP languages can exhibit interactions between definiteness and other properties that are not found in DP languages.

9. Conclusion

We have discussed a number of issues regarding the syntax and the semantics of Chinese TNPs within the general framework of Bošković (2008, 2012) and Chierchia (1998), where Chinese lacks DP. In particular, we have argued that the rather free ordering of TNP-internal elements in Chinese follows from se-

mantic considerations, and provides strong evidence for the lack of DP in Chinese. We have argued that the binding properties of Chinese possessors also provide evidence for the no-DP analysis. We have also provided an account of the Mandarin plural marker *-men* on which ClassifierP is the source of definiteness in Chinese, along the lines of Cheng and Sybesma (1999), tying the number/definiteness interaction found in Mandarin to its lack of DP. Finally, while in both Serbo-Croatian (SC) and Chinese the ordering of TNP-internal elements is largely free from syntactic constraints and follows from semantic considerations, there are some differences between Chinese and SC which we have argued can be accounted for given a difference between Chinese and SC demonstratives with respect to contextual pronominal variables in the denotation of the demonstratives. The NP/DP analysis thus accounts not only for the different behavior of article-less languages like SC and Chinese and article languages like English regarding the freedom of word order and binding possibilities within TNPs but also for the remaining difference between Chinese and SC regarding the ordering of TNP-internal elements concerning demonstratives, which is tied to an independent factor, namely the classifier language status of Chinese.

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