

On word order, binding relations, and plurality within Chinese NPs

Željko Bošković and I-Ta Chris Hsieh

University of Connecticut

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.

Keywords

adjectives, classifiers, demonstratives, possessors, relatives

1. Introduction

Bošković (2008, 2010) argues based on a number of syntactic and semantic crosslinguistic generalizations that languages without articles, like Chinese, lack DP. Chierchia (1998) makes the same claim for languages like Chinese based on very different considerations regarding the semantics of traditional Noun Phrases (TNPs).¹ 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 traditional plural marker *-men* in Mandarin, providing an account of it in a system that treats ClassifierPhrase (CIP) 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 with respect to Conditions A, B, and C. We will start the discussion by examining in a bit more detail one of Bošković's (2008) generalizations. More precisely, we will examine how Bošković's negative raising generalization applies to Chinese.

2. The NP/DP parameter and negative raising

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

¹TNP is a neutral term that does not take a stand on the potential presence of functional projections in this domain.

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

Bošković (2008, 2010) argues that there is a fundamental structural difference in the TNP of English and article-less languages like Chinese based on a number of wide-ranging syntactic and semantic phenomena that correlate with the presence or absence of articles which are given below.²

- (3) **Generalizations** (see Bošković 2008 and references therein)
 - a. Only languages without articles may allow left-branch extraction out of TNPs.
 - b. Only languages without articles may allow adjunct extraction from TNPs.
 - c. Only languages without articles may allow scrambling.
 - d. Multiple-wh fronting languages without articles do not show superiority effects.
 - e. Only languages with articles may allow clitic doubling.
 - f. Languages without articles do not allow transitive nominals with two genitives.
 - g. Head-internal relatives display island sensitivity in languages without articles, 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. Languages without articles disallow negative raising (i.e. strict clause-mate NPI licensing under negative raising); those with articles allow it.
- (4) **Additional generalizations** (see Bošković 2010 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 languages without articles.
 - d. Number morphology may not be obligatory only in TNPs of languages without articles.
 - e. Elements undergoing focus movement are subject to a verb 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 languages without articles.
 - h. The sequence of Tense phenomenon is found only in languages with articles.
 - i. Second position clitic systems are found only in languages without articles.
 - j. Obligatory numeral classifier systems are found only in languages without articles.

²See Bošković (2008, 2010) for detailed discussion, including illustrations of the generalizations in (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 out of finite clauses of the kind found in Japanese). Notice also that what matters for these generalizations is the presence of a definite article in a language since Slovenian, a language which has indefinite but not definite article, patterns with article-less languages regarding these generalizations, see Bošković (2009b).

- k. Only languages without articles may allow subject reflexives.

These generalizations, which are syntactic and semantic in nature, indicate that there is a fundamental difference in the TNP of languages with articles and languages without articles that cannot be reduced to phonology (overt vs. null articles). Furthermore, Bošković (2008, 2010) and Bošković and Gajewski (in press) show that the generalizations can be deduced if languages that lack articles lack DP altogether. 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 is 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 noted in Bošković (2010), a number of these generalizations are still relevant for Chinese, in particular the generalizations in (3)i,j and (4)a,c,d,e,f,g,j,k. Furthermore, Cheng (in preparation) provides a detailed discussion of the arguments for DP in Chinese offered in the literature and demonstrates that none of these arguments go through. In light of the above generalizations, Chierchia's (1998) no-DP analysis of the semantics of Chinese TNP, as well as 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 would like to examine one of the above generalizations, namely (3)j, with respect to Chinese.

The Negative Raising 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 in the structure, as confirmed by the strict clause-mate NPIs in (7). That these items require negation is shown by (5), while (6) shows that 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 clausemate NPI licensing under NR depends on whether it has articles. Thus, SC, Czech, Slovenian, Polish, Russian, Ukrainian, Turkish, Korean, and Japanese lack articles and disallow strict clause-mate NPI licensing under NR. On the other hand, 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 (in press) demonstrate that the generalization can be deduced under the DP/NP analysis given Gajewski's (2005) account of strict clause-mate NPI licensing with NR. Note that the generalization in question does not concern lower clause negation interpretation, which is available even in languages without articles (see Bošković 2008)), it concerns only strict clause-mate NPI licensing.)

Bošković (2008) cites Chinese as another article-less language that observes (3)j based on the Chinese counterpart of (7)a, namely (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, inspired by comments from Roger Liao. Consider the following data.

- (9) Lisi zuotian *(meiyou) hua ban mao qian
 Lisi yesterday NEG spend half cent money
 ‘Lisi did not spend any money yesterday.’
- (10) (*)Zhangsan meiyoun renwei Lisi zuotian hua (le) ban mao qian
 Zhangsan NEG think Lisi yesterday spend PERF. half cent money
 ‘Zhangsan does not think that Lisi spent any money yesterday.’
- (11) (*)Zhangsan meiyoun shuo/xuancheng Lisi zuotian hua (le) ban mao qian
 Zhangsan NEG say/claim Lisi yesterday spend PERF. half cent money
 ‘Zhangsan didn’t say/claim that Lisi spent any money yesterday.’

The item in question, namely the minimizer *ban mao qian* ‘half cent’, requires negation, as shown by (9). There is, however, quite a bit of disagreement among our informants regarding the judgments on (10) and (11), where (10) involves a neg-raising predicate and (11) a non-neg-raising predicate. In a preliminary investigation, we have observed that speakers generally fall into two groups. For one group of speakers both (10) and (11) are unacceptable. For these speakers, the examples in question confirm that Chinese does not allow strict clause-mate NPI licensing under NR, in accordance with the generalization in (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, namely *ban mao qian* ‘half cent’ is simply not a strict clause-mate NPI for them. We suggest that these speakers treat the phrase *ban mao qian* ‘half cent’ as a weaker type of NPI than English strict NPIs such as *until*_{NPI} (for discussion showing that so called ‘NPIs’ vary in their licensing conditions, see Zwarts 1998). Note that, as shown by (12), for these speakers the *half*-phrase can be licensed by a negative quantifier in the matrix scope. (Note, however, that speakers who find (10) and (11) unacceptable also find (12) unacceptable). Importantly, as shown by (13), a negative quantifier cannot license a strict NPI in the complement of a negative raising 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.³

³Alternatively, as observed by Yimei Xiang (p.c), *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* is optional in simple negation contexts like (9) but obligatory in (12)).

Note also that *renhe*, an item that 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 in the complement of non-NR verbs like *hear*, in contrast to strict clause-mate NPIs.

- (i) Lisi meiyoun tingshuo Zhangsan kanjian renhe ren
 Lisi neg hear Zhangsan see RENHE people
 ‘Lisi didn’t hear that Zhangsan saw anyone.’

- (12) Meiyou ren renwei Lisi zuotian hua (le) ban mao qian
 none person think Lisi yesterday spent PERF half cent cent
 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 some binding properties of Chinese possessors. In his NP analysis of Serbo-Croatian (SC), Bošković (2010) treats SC possessors and demonstratives as NP-adjuncts. One of the arguments for this analysis, noted by Despić (2011), is provided by (15), which contrast with English (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).

- (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 (2010) observes that Chinese and Japanese pattern with SC in this respect, as shown by (16), and Bošković and Şener (2012) make the same observation for Turkish, which provides strong evidence for the no-DP analysis for the languages in question (for additional discussion of Chinese and Japanese, see Cheng (in preparation) and Takahashi (2011) respectively).⁴

- (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’

(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.’

⁴The Condition B violation is observed perhaps even more obviously in the case of quantified 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.’

- d. *Kare_i-no saisin-no eega-wa hontoo-ni Kurosawa_i-o rakutans-ase-ta.
 he-GEN latest- GEN movie-top really Kurosawa- ACC 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 the binding of anaphors by possessors in Chinese. It is well-known that Chinese possessors can also bind anaphors outside of their TNP, as shown by (17) (there are interfering factors with the anaphor binding 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).⁵

⁵There are cases where the possessor appears not to c-command *taziji* it binds in overt syntax, see Pan (1998). It is possible that such cases involve logophors or an additional LF movement; for much relevant discussion see Y.-R. Liou (in preparation) (see also 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, also noting that such examples have already been noted in the literature. (See Takahashi 2011 for discussion of other factors that are relevant here. Thus, focus can affect even the basic binding paradigm from (15)-(16).)

- | | | | | | | |
|-----|----|--|---------------------------|--|----------------------------|-----------------|
| (i) | a. | [Kare _i -no
he _i -Gen | hahaoya]-ga
mother-Nom | John _i -o
John _i -Acc | seme-ta
criticize-Past | (koto)
fact |
| | | 'His _i mother criticized John _i .' | | | | (Hoji 1985:7) |
| | b. | John _i -no
John _i -Gen | sensei-ga
teacher-Nom | kare _i -o
he _i -Acc | bengosi-ta.
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 in (i). Significantly, it is well-known that the possessor in constructions of this type in Chinese fails to c-command out with respect to Condition A, i.e. anaphor binding, as shown in (ii).

- (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 the above discussion, the ungrammaticality of (ii) may not be surprising. This discussion sheds new light on the well-known binding 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 that it could be recast in different terms: whether or not the possessor is an adjunct or an argument. There is a problem, however. While, as noted above, there is speaker variation in SC, Japanese, and Turkish with respect to examples like (i) that involve relational nouns (in contrast to non-relational noun examples like (15), our Chinese informants reject the Chinese counterpart of (i) given in (iii). Importantly, this also holds for the speakers who reject (ii).

4. Word order in Chinese TNP

We now turn to word order within Chinese TNP. Bošković (2009a, 2010) observes that 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 within TNP in DP languages that are not found in NP languages due to the lack of the syntactic structure that is responsible for these restrictions. Thus, in English, demonstratives and possessives must precede adjectives because they are located in the DP projection, which is higher than the projection within which 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 very 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 to English. This follows under Bošković's (2009a, 2010) analysis, where syntax does not impose any restrictions on the order of these elements in NP languages, due to a poorer structure of the TNP. There are, however, some interesting differences between Chinese and Serbo-Croatian (SC), both of which are NP languages. What is relevant here is that Bošković (2009a, 2010) 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, 2010) demonstrates that the word order within SC TNP transparently reflects semantic composition, i.e. it follows from the semantics of the elements in question. As an illustration, 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 *expensive John's picture

Given the standard assumption that both adjectives and possessors are of type $\langle e, t \rangle$, compositional semantics does not 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 in which adjectives are located. Since SC does not have

-
- (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 is 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 some relevant discussion, see Pan (1998) and Pollard and Xue (1998). It should be noted that Pollard and Xue in fact question the animacy effect in general, providing cases where the effect is overridden by discourse/pragmatic factors, which may indicate that the phenomenon in question is not relevant to our concerns here.)

DP, syntax does not 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 various elements that belong to the TNP. Thus, in Chinese, adjectives and possessors can also occur in either order, which is not surprising given the above discussion: this can in fact be accounted for in the same way as the corresponding SC facts.

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

Notice also that an adjective that precedes a possessor does not 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 (2010), Despić (2011), 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 njegov_i [NP filmovi]]]} su razočarali Kusturicu_i
 numerous his movies are disappointed Kusturica

Notice also that the same holds regarding Condition A effects, 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 now to SC, in SC demonstratives must precede possessors and adjectives.

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

As discussed in Bošković (2009a, 2010), this is expected under the semantic account of word order restrictions in the SC TNP. Kaplan (1977/1989) argues that 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. Thus, a demonstrative element like *that* is a function of type $\langle\langle e, t \rangle, e \rangle$.

Once a demonstrative has mapped a nominal element to an individual, further modification by predicates of type $\langle e, t \rangle$ is impossible. Hence, semantic composition requires both adjectives and possessives to be composed before demonstrative determiners. In other words, semantic composition allows possessives to be composed either before or after modifying adjectives, while demonstratives must be composed after both adjectives and possessives.⁶ This perfectly matches the actual facts regarding the ordering of the elements in question 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 very 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 latest movie him is really disappointed
- ‘This latest movie of Kusturica_i really disappointed him_i.’
- b. *_{[NP Ovaj [_{NP} njegov_i [_{NP} najnoviji [_{N'} film]]]] je zaista razočarao Kusturicu_i.}
- this his latest movie is really disappointed 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 noted in Bošković (in preparation), 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.⁷

- (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.

⁶Notice that this also holds for adjectives like “former”, which can be considered to be of type $\langle\langle e, t \rangle, \langle e, t \rangle\rangle$. In fact, as noted in Bošković (2010), the account can be quite generally extended to non-restrictive adjectives under Morzycki’s (2008) analysis, where non-restrictive adjectives are also treated as having type $\langle e, t \rangle$ and required to be interpreted inside the determiners.

⁷See Bošković (in preparation) for a more detail discussion of such constructions in Chinese. It is argued in that work that the classifier that occurs with a demonstrative is a different type of element from classifiers in other constructions; it does not project a separate phrase but is simply adjoined to the demonstrative.

- (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.’

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 word order within TNP. Thus, possessors and adjectives are also allowed to precede a demonstrative, in contrast to SC.

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

We believe that this provides very strong confirmation of the no-DP analysis of Chinese, on which the elements in question are all NP-adjoined (recall that 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 and an adjective precede a demonstrative, can be interpreted semantically. The problem here is how to interpret a restrictive modifier that is syntactically realized outside of a demonstrative. The answer that we will propose to this puzzle will unify this issue with another puzzling property of Chinese, which concerns the traditional plural marker *-men* in Mandarin.

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

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

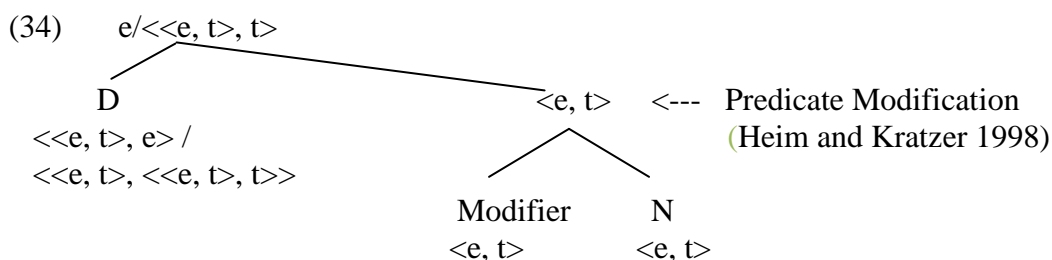
- (28) SG PL
 a. boy boy-s
 b. student student-s
 (29) a. nanhai vs. nanhai-men
 ‘boy’ boy-MEN
 ‘the boys’
 b. xuesheng vs. xuesheng-men
 student student-MEN
 ‘the students’
 (30) a. wo vs. wo-men
 ‘I’ I-men
 ‘we’
 b. ni vs. ni-men
 ‘you’ you-MEN

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

The examples below show that common nouns suffixed with *-men* can be further modified by adjectives, relative clauses and possessives.

- (31) a. yingyongde zhanshi-men
 brave warrior-MEN
 'the brave warriors'
 b. congmingde xuesheng-men
 smart student-MEN
 'the smart students'
- (32) a. wo renshi de laoshi-men
 I know REL teacher-MEN
 'the teachers I know'
 b. Zhangsan xihuan de geshou-men
 Zhangsan like REL singer-MEN
 'the singers John likes'
- (33) a. wo-de xuesheng-men
 I-GEN students-MEN
 'the students of mine'
 b. ta-de haizi-men
 he-GEN children-MEN
 'the children of his'

The data from Chinese shown in (31)-(33) pose a challenge to the semantic composition of noun phrases. As mentioned above, the attachment of *-men* gives rise to definiteness; the problem is how to realize definiteness with a restrictive modification that is syntactically outside of the source of the definiteness. As noted briefly above, modifiers such as intersective adjectives, relative clauses, and possessive phrases are standardly treated as function of type $\langle e, t \rangle$. Partee (1976) and Heim and Kratzer (1998), among others, have proposed that the semantic calculation of noun phrases with modification should be like (34). In (34), the modifier and the noun are first combined together. With the help of the compositional rule Predicate Modification, we get a predicate of type $\langle e, t \rangle$, which the determiner or a quantifier applies on.



This analysis runs into problems when the data in (31)-(33) are considered. In (31)-(33), the morpheme *-men* and the common noun seem to be combined together before the

modifier comes in (see the schema in (35)a). However, if the source of the definiteness comes from *-men*, then the analysis in (34) cannot work, for at the surface the morpheme *-men* is combined first with the common noun, not 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 biao xian
 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 composition problem is reminiscent of the issues regarding the data in (27), where a possessor and an adjective precede a demonstrative; that is, an analysis along the lines of Partee (1976) and Heim Kratzer (1998) also runs into problems when the data in (27) are considered. In (27) the demonstrative and the common 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 in the literature with respect to relative clauses. Like possessors and adjectives, relative clauses can also occur either before or after determiners (i.e. demonstratives), more precisely, the demonstrative-numeral-classifier (DNC) sequence. In a detailed discussion, Lin (2003) shows that 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.

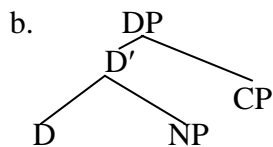
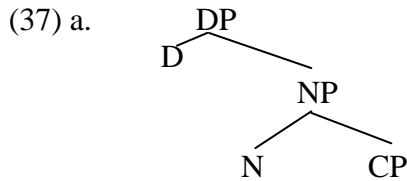
- (36) a. na-ge dai yanjing de xuesheng
 that-CL wear glasses REL student
 'that student who wears glasses'
 b. dai yanjing de na-ge xuesheng
 wear glasses REL that-CL student
 'that student who wears glasses'

Lin (2003) proposes a semantics for cases like (36)b that is built on an idea by Bach and Cooper (1978). We will show that his analysis of pre-DNC relative clauses in examples like (36)b can be applied to the data in (31)-(33) as well as (27). The ideas of Bach and Cooper (1978) and Lin (2003) are summarized in the next section.

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

Partee (1976) argues that the structure in (37)a is more appropriate for restrictive relative clauses than the one in (37)b in that (37)a provides a better match between syntax and semantics for complex noun phrases with restrictive relative clauses. In

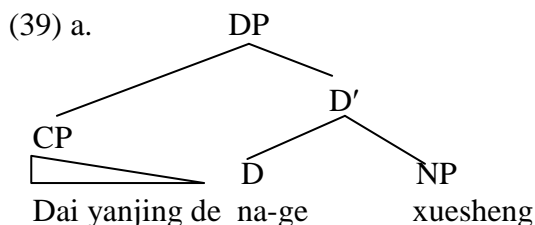
(37)a, the head noun and the relative clause CP are combined and serve together as the restrictor of the determiner, which can be a definite article or a quantifier. On the other hand, it is not straightforward for the relative clause CP to be accommodated as part of the restrictor of the determiner in (37)b.



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

(38) ša na-hi a-ia kuieš gunni meš nu kuišša 1 gìn
 GEN. stone-pl. -and which hearth-pl. ptc. each 1 shekel
 ‘And every hearth which is made of stones costs 1 shekel.’ (Bach and Cooper 1978)

Bach and Cooper (1978) 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 in 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 their analysis, Lin (2003) shows that the pre-DNC relative clause like (36)b can be analyzed as in (39).⁸ In Lin’s analysis, a demonstrative NP *that N* is treated as a generalized quantifier. In his analysis, the free function variable *h* in the denotation of the determiner carries the same function as that of a contextual pronominal variable (von Stechow 1994; Marti 2003, among others); while the value of 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 $h_{\langle e, t \rangle}$ receives its value from the pre-DNC relative clause *dai yanjing de* (who wears glasses), whose type is also $\langle e, t \rangle$.



⁸Lin (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 discussion of the interpretation of Chinese relatives, see also Huang 1982, Lin 1997, Zhang 2001, Del Gabbo 2001, among others). Notice also that Lin (2003) assumes a DP structure for Chinese, but his analysis can be easily adapted to the no-DP approach.

- b. $\llbracket \text{NP} \rrbracket = \lambda x. x \text{ is a student}$
 $\llbracket \text{D} \rrbracket = \lambda f_{\langle e, t \rangle}. \lambda g_{\langle e, t \rangle}. \text{ THAT } x \text{ s.t. } f(x) \text{ and } \mathbf{h}(x) \text{ and } g(x)$
 $\llbracket \text{D}' \rrbracket = \lambda g_{\langle e, t \rangle}. \text{ THAT } x \text{ s.t. } x \text{ is a student and } \mathbf{h}(x) \text{ and } g(x)$
 $\llbracket \text{CP} \rrbracket = \lambda x. x \text{ wears glasses}$
 $\llbracket \text{DP} \rrbracket = \lambda g_{\langle e, t \rangle}. \text{ THAT } x \text{ s.t. } x \text{ is a student and } x \text{ wears glasses and } g(x)$

It should be noted that analyses on which a free contextual (function) variable receives a value specified by a syntactic constituent have been appealed to in other cases as well. For instance, assuming that modals quantify over possible worlds, Kratzer (1977, 1981) has pointed out that the domain of a modal quantifier is restricted by such variables whose value can be explicitly specified by an adverbial phrase. In (40), the adverbial phrase *in view of* serves to explicitly specify the set of worlds the modal quantifies over (i.e. what kind of worlds are relevant to the quantification of the modal). Another example that involves the use of contextual pronominal variables is superlatives (see e.g. Heim 1999). The interpretation of superlatives is highly contextually dependent; in (41), the PP *among...* serves to explicitly specify the context where the comparison takes place. In all these examples, while the adverbials occur outside of the scope of the modals and the superlatives, semantically they are interpreted as part of the restrictor of these elements.

- (40) a. In view of the laws of nature, this plant can grow here.
 b. In view of the laws of Connecticut, John may not buy alcohol after 9pm.
 (41) a. Among the three people in front of me, John is the tallest.
 b. Among New York, London and Paris, I like Paris the most.

7. Resolving the word order/semantic composition issue

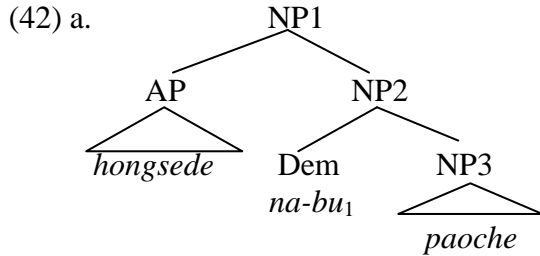
7.1 Pre-demonstrative modification

Returning to the data in (27), Lin's analysis of (36)b can be easily extended to these data. Possessors and intersective adjectives can be treated just like relative clauses, which means that 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 $\langle e, t \rangle$, 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 | | red | that-CL | sport-car |
| | | sport-car | | | | |
| b. na-bu | Zhangsan-de | che | vs. | Zhangsan-de | na-bu | che |
| | that-CL | Zhangsan-GEN | | Zhangsan-GEN | that-CL | car |
| | | car | | | | |

While we will apply Lin's (2003) analysis to these cases, slight modifications will be made without leading to different predictions. Here we assume that a demonstrative like *na-CL* bears an index and denotes a function from properties of type $\langle e, t \rangle$ to individuals. Further restriction from the pre-demonstrative modifier is specified through the assignment function *g* applying on the index of the demonstrative. The

semantic composition of the TNP with a demonstrative following an adjective, as in (27)a, is given in (42): as shown in (42), the pre-demonstrative modifier *hongsede* specifies the value of the variable assignment $g(1)$. Through the variable assignment $g(1)$ that is built in into the denotation of the demonstrative *na-CL*, the pre-demonstrative modifier in (42) can serve to restrict the demonstrative.



- b. $\llbracket \text{NP3} \rrbracket^g = \lambda x. x \text{ is a sports car}$
 $\llbracket \text{na-bu}_1 \rrbracket^g = \lambda f_{\langle e, t \rangle}. \text{ THAT individual } x \text{ such that } g(1)(x) = f(x) = 1$
 $\llbracket \text{hongsede} \rrbracket^g = \lambda x. x \text{ is red}$
 $\llbracket \text{NP2} \rrbracket^g = \text{ THAT individual } x \text{ such that } g(1)(x) = 1 \text{ and } x \text{ is a sports car}$
 $\llbracket \text{NP3} \rrbracket^g = \text{ THAT individual } x \text{ such that } x \text{ is red and } x \text{ is a sports car}$
 (where $g^{[1 \rightarrow \lambda x. x \text{ is red}]}$; Assignment Modification)

Possessive expressions, such as *Zhangsan-de* ‘Zhangsan’s’, are taken to be of type $\langle e, t \rangle$ in the literature (Partee and Borschev 1998, among others). Here we assume that a possessive expression like *Zhangsan-de* has the denotation in (43); the analysis in (42) can then be easily applied to TNPs with pre-demonstrative possessive expressions.

(43) $\llbracket \text{Zhangsan-de} \rrbracket^g = \lambda x. x \text{ belongs to Zhangsan}$

Notice now that a contextual pronominal variable analysis should not be freely (more precisely, as freely as in Chinese) available for SC demonstratives, otherwise possessors and adjectives could precede demonstratives in SC too. While we will leave open at this point whether this difference can be tied to anything else (note, however, that whether an element introduces a contextual variable depends on its lexical semantics and the range of lexical variation can be pretty wide), we will offer a speculation that the presence of a classifier on the demonstrative in Chinese may matter here.

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 the composition in (42), receiving the value from the modifier through the mediation of the assignment function applying on the index on the variable or the demonstrative).

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

An implicit assumption in this analysis is that the contextual variable/restriction of the demonstrative has to be syntactically visible (at least in LF). Assuming that the syntactic

structures we gave serve as the input for semantic composition, only 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 assumption 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. Hence, the only way to interpret a modifier is to have it adjoin under the demonstrative, as discussed in section 4. The alternative, which has the same result, is to assume that there is no contextual pronominal variable in the denotation of SC determiners.

We speculate here that the different behavior of Chinese and SC demonstratives with respect to 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 7) is an overt realization of this syntactically visible contextual restriction (see also Martí 2003 for independent evidence that contextual pronominal variables are syntactically active in Chinese).

7.2 TNPs with *-men*

We now turn to Chinese NPs with *-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*.

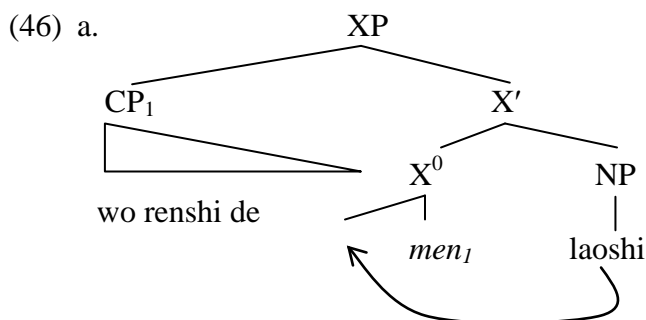
Consider the details of the analysis. First we assume that *-men* denotes a function that maps a property of type $\langle e, t \rangle$ to plural individuals. Just like the demonstrative in (42), *-men* bears an index and functions like a free pronoun; the modifier in the TNP with *-men* then restricts the quantificational domain of *-men* by specifying the free variable introduced in the denotation of *-men*. The (preliminary) denotation of *-men* is given in (45).

(45) $\llbracket -men_n \rrbracket^g = \lambda f_{\langle e, t \rangle}$. the unique X such that, for all $x \in X$, $g(n)(x)$ and $f(x)$

By building into the semantics of *-men* a function whose value is determined by the discourse context, we can take the modifier phrases in (31)-(33) to be a specification of the value of this free variable. Take (32)a for example; assuming that (46)a is the LF for (32)a, the semantic composition of (32)a is given in (46)b.⁹ In the following, we treat *N-men* as denoting the unique group in the discourse (i.e. a plural individual; see, e.g., Link 1983; Schwarzschild 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 that the noun *laoshi* undergoes movement to adjoin to Cl^0 , which also ends up providing a host for *-men*, satisfying the affixal nature of *-men*.¹⁰

⁹ In (46), for sake of simplicity, we temporarily remain agnostic regarding the grammatical category of *-men*, an issue that will be addressed below.

¹⁰ Alternatively, the movement in question may involve NP movement to SpecXP, which could explain why nothing may follow the *N-men* sequence. It is, however, possible that structures where something

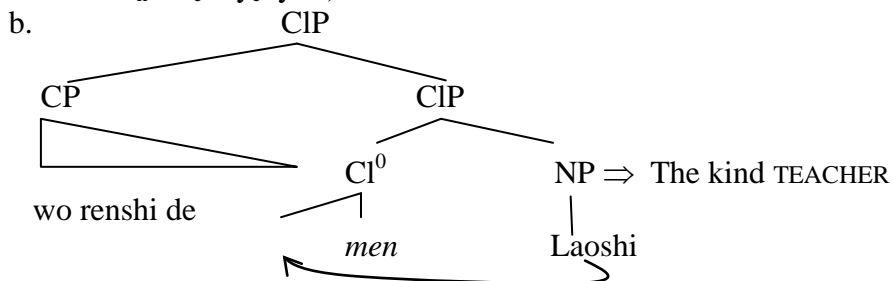


- b. $\llbracket \text{NP} \rrbracket^g = \lambda x. x \text{ is a teacher}$
 $\llbracket \text{men}_1 \rrbracket^g = \lambda f_{\langle e, t \rangle}. \text{the unique } X \text{ such that, for all } x \in X, g(1)(x) \text{ and } f(x)$
 $\llbracket \text{X}' \rrbracket^g = \text{the unique } X \text{ such that, for all } x \in X, x \text{ is a teacher and } g(1)(x)$
 $\llbracket \text{CP} \rrbracket = \lambda x. \text{I know } x$
 $\llbracket \text{XP} \rrbracket = \text{the unique } X \text{ such that, for all } x \in X, x \text{ is a teacher and I know } x$
 (Assignment Modification, $g^{[1 \rightarrow \lambda x. \text{I know } x]}$)

In (46), $g(1)$ in the semantics of $-men$ is a function that provides a further restriction on the quantificational domain of $-men$. The relative clause *wo renshi de* ‘that I know’ then specifies the value of $g(1)$ through the modification of the value that the assignment function g assigns to the index 1 (Assignment Modification; Heim and Kratzer 1998). In (46), while the relative clause adjoins outside of the plural noun phrase, semantically it is interpreted within the scope of the plural morpheme $-men$. The case of pre-nominal adjectives like (31) and that of possessive expressions like (33) can be accounted for in the same way.

Chierchia (1998) proposes that bare nouns in Mandarin are kind-denoting and of type e . To incorporate Chierchia’s proposal regarding the semantics of common nouns in Mandarin, the structure and the semantics of the definite plural NP formed by the attachment of $-men$ given in (46) can be further implemented as in (47), which also incorporates a particular proposal regarding the structural position of $-men$.

- (47) a. $\llbracket -men_n \rrbracket^g = \lambda x_k \in D_e. \text{the unique } X \text{ such that } X \in \text{PL}(\cup x_k) \text{ and for all } x \in X, g(n)(x)$
 (where $\text{PL} =: \lambda f_{\langle e, t \rangle}. [\lambda x. [\neg F(x) \text{ and for all } y \text{ such that } y \text{ is an atom of } x, F(y)]]]$;
 $\cup =: \lambda x_k \in D_e. \lambda y_e. y \leq x$)



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 $-men$ actually 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).

- c. $\llbracket \text{NP} \rrbracket^g = \text{TEACHER}_k$
 $\llbracket \text{-men}_1 \rrbracket^g = \lambda x_k \in D_e. \text{ the unique } X \text{ such that } X \in \text{PL}(\cup x_k) \text{ and for all } x \in X, g(1)(x)$
 $\llbracket \text{X}' \rrbracket^g = \text{ the unique } X \text{ such that } X \in \text{PL}(\cup \text{TEACHER}_k) \text{ and for all } x \in X, g(1)(x)$
 $\llbracket \text{CP} \rrbracket = \lambda x. \text{ I know } x$
 $\llbracket \text{XP} \rrbracket = \text{ the unique } X \text{ such that } X \in \text{PL}(\cup \text{TEACHER}_k) \text{ and for all } x \in X, \text{ I know } x$
 (Assignment Modification, $g^{[1 \rightarrow \lambda x. \text{ I know } x]}$)

In (47)b, we assume that *-men* is base-generated under Cl^0 (following broadly the spirit of Borer 2005). This explains why TNPs with *-men* are incompatible with a numeral-classifier sequence, i.e. this accounts for the ungrammaticality of (48), where *-men* and classifier *ge* co-occur.¹¹ As noted below, this may also explain the definiteness of *-men* NPs.

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

As shown in (47), syntactically *-men* heads CIP and takes NP as its complement; semantically it denotes a function from a kind-denoting individual to a discourse-salient plural individual whose atomic members all belong to the extension of the kind-denoting noun *-men* takes as complement. In the semantics given in (47), *-men* first pluralizes the property that is derived from its complement NP and then picks up the maximal plural individual. Two type-shifting operations PL and \cup are used in the same way as in Chierchia (1998).

It is also worth noting here that the above analysis fits well with the spirit of Cheng and Sybesma's (1999) claim that in Chinese, the information regarding

¹¹Notice that the no-DP analysis does not require all functional projections to be missing from the Chinese TNP. In fact, working within a no-DP system, Bošković (2010, in preparation), Cheng (in preparation), and Takahashi (2011) argue that an additional projection, which for ease of exposition we will refer to as CIP, is present above NP in Chinese numeral+classifier constructions (see Bošković 2010, in preparation and Despić 2011 for evidence that an additional projection is present above NP in SC numeral constructions; Bošković (in preparation) actually argues that this has to do with number given that SC numerals do not co-occur with a classifier. See also this work for relevant discussion of Chinese demonstrative+classifier constructions). Note also that we assume that when CIP is present, elements that are normally adjoined to NP are (or can be) adjoined to TNP. Note in this respect that the possessor in (i) induces a binding violation, which indicates that it is TNP-adjoined (more precisely, CIP-adjoined, given that the presence of *-men* and num+cl indicates the presence of CIP).

- (i) a. * $\text{Ta}_i\text{-de jufaxuejia-men hui le Weiruan}_i$
 it-GEN syntactician-MEN destroy PERF Microsoft
 'Its_i syntacticians destroyed Microsoft_i.'
- b. * $\text{Ta}_i\text{-de san bu jinqide dianying ciji-le Li-An}_i$
 He-GEN three CL recent movie provoke-PERF Li-An
 'His_i three recent movies provoked Li-An_i.'
- c. ?* $\text{Weiruan}_i\text{-de jufaxuejia-men hui-le ta}_i$
 Microsoft-GEN syntactician-men destroy PERF it
 'Microsoft_i's syntacticians destroyed it_i.'
- d. * $\text{Li-An}_i\text{-de san bu jinqide dianying ciji-le ta}_i$
 Li-An-GEN three CL recent movie provoke-PERF him
 'Li-An's_i three recent movies provoked him_i.'

definiteness is syntactically localized in the classifier projection.¹² In particular, Cheng and Sybesma (1999) argue that classifiers in Chinese play the deictic function and that CIP is the source of definiteness in Chinese. The analysis suggested in (47) is consistent with the spirit of their claim given that in (47) *-men* is base-generated under CI^0 hence the source of definiteness in a *-men* NP can be taken to be the projection of the classifier.¹³ Note also that while the modifier in (47) adjoins above *-men*, semantically 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*.

While the covert function variable $g(1)$ in the semantics of *-men* in (47) can receive the value from the modifier phrase that adjoins outside the *-men* NP, this does not have to be the case. This is suggested by the compatibility of non-restrictive modifiers such as *questionable* with *-men* NPs, an example of which is given in (49). Given that the modifier *questionable* ‘keyide’ is non-intersective, the contextual variable $g(1)$ cannot receive the value of this modifier.¹⁴

- (49) keyide xuesheng-men
 questionable student men
 ‘the questionable students’

7.3 Pronouns and *-men*

As already shown in (30), *-men* can be attached to singular pronouns to form their plural counterparts.

- (30) a. wo vs. wo-men
 ‘I’ I-men
 ‘we’
 b. ni vs. ni-men
 ‘you’ you-MEN
 ‘you (pl.)’

¹²There is another possibility under the Cheng and Sybesma overall 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 will put this possibility aside here, adopting the *-men-as-a-classifier* analysis in the text.

¹³For Cheng and Sybesma, addition of a NumP on top of CIP basically undoes the definiteness of CIP. Adopting this into the current analysis would entail that there is no NumP on top of CIP in the case of *-men*, *-men* is basically a conflated Num and Cl (on conflated Num/Cl (though in a different context), see also Tang 1990; for relevant discussion see also Borer 2005).

¹⁴Our preliminary investigation indicates that it may be harder for non-intersective adjectives (though not all of them) to precede a demonstrative. This could be accounted for under Morzicky’s (2008) analysis mentioned in footnote 6, where such elements are also interpreted inside the determiners (as noted in the text, the contextual pronominal variable option, which “licenses” adjunction of adjectives outside of the determiner, does not affect such adjectives).

- (i) a. na-ge keyide xuesheng
 that-CL questionable student
 ‘that questionable student’
 b. ??/*keyide na-ge xuesheng
 questionable that-CL student

c. ta vs. ta-men
 he/she he/she-MEN
 ‘they’

(50) shows that it is possible to modify a plural pronoun that is formed by the attachment of *-men*.

- (50) a. congming de ni-men ziji xiang banfa jiejie ba!
 smart DE you-men yourselves think ways solve EXCL
 Translation: you smart people think of a way to solve it yourselves.
 b. xinku _____ de ta-men cai ganggang ba fangjian qingliganjiang
 hard-working de he-men until just do room clean
 Translation: 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 (see (51)). (52) shows that a common noun can follow the pronoun-*men*-num-Cl sequence.

- (51) wo-men/ni-men/ta-men san ge
 I-MEN/you-MEN/he.MEN three cl
 ‘we/you(pl.)/they three’
 (52) ta-men san ge xuesheng
 he-men three CL student
 ‘they three students’

Note that 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, as shown in (53).

- (53) *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 (54) means (55)b, not (55)a.

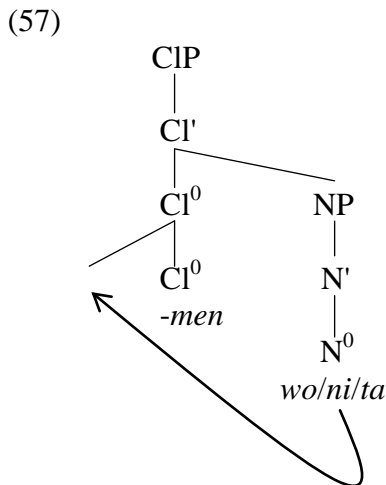
- (54) congming de ni-men ziji xiang banfa jiejie ba!
 smart DE you-men yourselves think ways solve EXCL
 Translation: you smart people think of a way to solve it yourselves.
 (55) a. those among you guys who are smart
 b. you people, who are smart

It has been reported (Li 1999; Cheng and Sysbesma 1999) that the morpheme *-men* can be attached to proper names, as in (56); the combination of proper names and *-men* in

(56) refers to a group of people that includes a person with the name *Xiaoqiang*. It should be noted however, that examples like (56) are rejected by many speakers.¹⁵

- (56) 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 and references cited therein). 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 (57). In (57), as suggested above, *-men* heads a classifier projection; the complement of *-men* is an NP that is headed by a singular pronoun. The pronoun then undergoes movement and adjoins to *-men*.¹⁶



Singular pronouns like *I*, *you*, and *he/she* are individual-denoting and are interpreted relative to the context; for instance, the pronoun *I* refers to the individual who is the speaker in the discourse context. On the other hand, in the semantics suggested above, *-men* takes an argument of type $\langle e, t \rangle$ rather than type e . To resolve the type mismatch, here we suggest a lexical rule in (59), according to which pronouns like *wo*, *ni*, and *ta* have a second meaning that is of type $\langle e, t \rangle$.¹⁷ Based on (59), with the second meaning, the pronouns like *wo*, *ni*, and *ta* denote a unique set of individuals in the discourse

¹⁵There may thus be some speaker variation in this respect. As noted above, many speakers find proper name+*men* sequences simply 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 that the same holds for most of her informants). To express the meaning given in (56), our informants generally use: *Xiaoqiang ta-men* (lit. *Xiaoqiang they*—meaning ‘they, and Xiaoqiang is included in that group’; see also Li 1999).

¹⁶ See Bošković (2008), Despić (2011), Fukui (1988), and Runić (2011) for arguments that even pronouns are Ns in NP languages.

¹⁷This lexical rule for Mandarin pronouns may be seen as a type-shifting operator of some sort. The idea of postulating a lexical rule to solve a type mismatch has been pursued in the research on other topics. For instance, Schwarzschild (2005) suggests a lexical rule (in his term, Homonym Rule) for gradable adjectives (of type $\langle d, \langle e, t \rangle \rangle$) that relates individuals to degrees so that a gradable adjectives may also relate individuals to sets of degrees (i.e. intervals).

context that contains the extension of the singular pronouns based on their first meaning. For instance, the second meaning of the first person *wo* is the unique set of individuals that includes the speaker; that of the second person *ni* is the unique set of individuals in the discourse context that contains the addressee. Based on the syntax in (57), *-men* then applies on the second meaning of the pronoun and gives a plural individual that is composed of the set of individuals denoted by the pronoun with its second meaning.

- (58) $\llbracket wo \rrbracket^{g,c} = \text{speaker in } c$
 $\llbracket ni \rrbracket^{g,c} = \text{addressee in } c$
 $\llbracket ta \rrbracket^{g,c} = \text{a unique individual in } c \text{ that is neither the speaker nor the addressee}$
- (59) For the pronouns *wo/ni/ta*, the 2nd meaning $\pi(\llbracket wo/ni/ta \rrbracket^{g,c})$ is defined as the following: $\pi(\llbracket wo/ni/ta \rrbracket^{g,c}) =$ the unique set of individuals X s.t X includes the speaker/hearer/a third person other than the speaker or the hearer
- (60) $\llbracket \neg men_1 \rrbracket^{g,c}(\pi(\llbracket wo/ni/ta \rrbracket^{g,c})) =$ the unique set of individuals X s.t X includes the speaker/hearer/a third person other than the speaker or the hearer

Note that the accessibility of a lexical item to the lexical rule in (59) should be seen as a lexical property; based on (59), the rule only applies to pronouns but not other expressions. The variation among speakers with respect to (56), a case of proper names combined with *-men*, then may be cashed out by assuming that for some speakers, rule (59) is extended to proper names.

As for the compatibility of plural pronouns with numeral-classifier sequences, illustrated by (51) and (52), we suggest that cases of this kind involve a structure like that in (61)a and that the plural pronoun performs a deictic function here. Cases like (51) and (52) can then be taken to be parallel with those of demonstrative NPs like (61)b.¹⁸

- (61) a.
-
- ```

graph TD
 CIP1[CIP] --- Ta-men
 CIP1 --- CIP2[CIP]
 CIP2 --- san
 CIP2 --- CI_prime[CI']
 CI_prime --- ge
 CI_prime --- NP[NP]
 NP --- xuesheng

```
- b. zhe san ge xuesheng  
 this three cl student  
 ‘these three students’  
 $[\text{CIP zhe} [\text{CIP san} [\text{CI}' \text{ge} [\text{NP xuesheng}]]]]$

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

<sup>18</sup>As an illustration that parallelism is warranted here, notice that nothing can intervene between *ta-men*/demonstrative and the numeral here (for an account of this, see Bošković in preparation).

shown in (53). While we do not have a fully worked out answer to this puzzle at the moment, we note here that treating the plural pronoun *ta-men* in (61)a as a demonstrative-like element opens up the possibility of making a parallel between the contrast in (51)/(52) and (53) and the contrast in the English examples in (62). Both plural pronouns and definite plurals refer to a unique group in the discourse; however, as (62) shows, while a plural pronoun in English may act like a demonstrative and carry out a deictic function (see (62)a), this is not the case with definite plural NPs (see (62)b). With the assumption that the plural pronouns in (51)-(52) function like a demonstrative, it seems safe to assume that an account that will explain the contrast in (62) will also account for the fact that Chinese nouns with *-men*, unlike *-men* pronouns, cannot occur with a post-nominal numeral-classifier sequence.

- (62) 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* with respect to 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) points out 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 (55) above).

## 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 that Mandarin does. When attached to common nouns the morpheme *-men* in Mandarin 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  $\text{Num}^0$ ;  $D^0$  introduces definiteness and  $\text{Num}^0$  introduces plurality. Since NP languages do not have a projection like DP that is dedicated to introducing definiteness, other functional elements such as  $\text{Cl}^0/\text{Num}^0$  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

In conclusion, we have discussed a number of issues regarding the syntax and the semantics of Chinese TNPs within the general framework of Bošković (2008, 2010) 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 semantic 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 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 Serbo-Croatian 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.

## References

- Bach, Emmon, and Robin Cooper. 1978. The NP-S analysis of relative clauses compositional semantics. *Linguistics and Philosophy* 2.1: 145-150.
- Borer, Hagit. 2005. *Structuring Sense*. Oxford: Oxford University Press.
- Bošković, Željko. 2004. PF Merger in stylistic fronting and object shift. *Minimality Effects in Syntax*, ed. by Arthur Stepanov, Gisbert Fanselow, and Ralf Vogel, 37-71. Berlin: de Gruyter.
- Bošković, Željko. 2008. What will you have, DP or NP? *Proceedings of the North East Linguistic Society* 37, ed. by Emily Elfnor and Martin Walkow, 101-114. Amherst: UMASS.
- Bošković, Željko. 2009a. More on the NP-DP analysis of article-less languages. *Studia Linguistica* 63:187-203.
- Bošković, Željko. 2009b. The NP/DP analysis and Slovenian. *Proceedings of the Novi Sad Generative Syntax Workshop* 1, 53-73. Novi Sad: Filozofski fakultet u Novom Sadu.
- Bošković, Željko. 2010. On NPs and clauses. Ms., University of Connecticut, Storrs.
- Bošković, Željko. in preparation. When is functional structure projected in NPs of languages without articles? Ms., University of Connecticut.
- Bošković, Željko, and John Gajewski. 2011. Semantic correlates of the NP/DP parameter. *Proceedings of the North East Linguistic Society* 39. Amherst: UMASS.
- Bošković, Željko, and Serkan Şener. Turkish NP. Ms., University of Connecticut, Storrs and Yeditepe University, Istanbul.
- Chierchia, Gennaro. 1998. Reference to kinds across languages. *Natural Language Semantics* 6, 339-405.
- Cheng, Hsu-Te Johnny. in preparation. *Null Arguments in Mandarin Chinese and the DP/NP Parameter*. Storrs: University of Connecticut dissertation.
- Cheng, Lisa Lai-Shen, and Rint Sybesma. 1999. Bare and not-so-bare nouns and the structure of NP. *Linguistic Inquiry* 30, 509-542.
- Cole, Peter, and Li-May Sung. 1994. Head movement and long distance reflexives. *Linguistic Inquiry* 25.3: 255-406.
- Cole, Peter, Hermon Gabriella, Kim Chonghyuck, Sim Chang-Yong, and Yaping Tsai. 2003. Anaphoric expressions in Javanese. *Proceedings of AFLA VIII: the Eighth Meeting of the Austronesian Formal Linguistics Association*, 107-121. MIT Working Papers in Linguistics 44. Cambridge: MIT.
- Corbett, Greville. 2000. *Number*. Cambridge: Cambridge University Press.



- Del Gobbo, Francesca. 2001. Appositives Schmappositives in Chinese. UCIWPL 7, ed. by Maki Irie and Hajime Ono, 1-25. Irvine: University of California.
- Despić, Miloje. 2011. *Syntax in the Absence of Determiner Phrase*. Storrs: University of Connecticut dissertation.
- von Fintel, Kai. 1994. *Restrictions on Quantifier Domains*. Amherst: UMASS dissertation.
- Fukui, Naoki. 1988. Deriving the differences between English and Japanese. *English Linguistics* 5, 249-270.
- Gajewski, Jon. 2005. *Neg-Raising: Presupposition and Polarity*. Cambridge: MIT dissertation.
- Heim, Irene. 1999. Notes on superlatives. Ms., MIT.
- Heim, Irene, and Angelika Kratzer. 1998. *Semantics in Generative Grammar*. Massachusetts: Blackwell.
- Hoji, Hajime. 1985. *Logical Form Constraints and Configurational Structures in Japanese*. Washington: University of Washington dissertation.
- Hoji, Hajime. 1990. On the so-called overt pronouns in Japanese and Korean. *Papers from the Seventh International Conference on Korean Linguistics*, ed. by Eung-Jin Baek, 61-78. Osaka: International Circle of Korean Linguistics & Osaka University of Economics and Law.
- Huang, C.-T. James. 1982. *Logical Relations in Chinese and The Theory of Grammar*. Cambridge: MIT dissertation.
- Huang, C.-T. James and C.-C. Jane Tang. 1991. The local nature of the long-distance reflexive in Chinese. *Long-Distance Anaphora*. ed. by Jan Koster and Eric Reuland, 263-282. New York: Cambridge University Press.
- Kaplan, David (1977/1989). Demonstratives. *Themes From Kaplan*. ed. by Joseph Almog, John Perry, and Howard Wettstein, 481-563. Oxford: Oxford University Press.
- Kratzer, Angelika. 1977. What *must* and *can* must and can mean? *Linguistics and Philosophy* 1.3: 337-355.
- Kratzer, Angelika. 1981. The notional category of modality. *Words, Worlds, and Contexts. New Approaches in Word Semantics*. ed. by Hans Jürgen Eikmeyer and Hannes Rieser, 38-74. Berlin: de Gruyter.
- Kratzer, Angelika. 2009. Making a pronoun: fake indexicals as windows into the properties of pronouns. *Linguistic Inquiry* 40:2, 187-237.
- Li, Yen-Hui Audry. 1999. Plurality in a classifier language. *Journal of East Asian Linguistics* 8: 75-99.
- Lin, Jo-Wang. 1997. Restrictive vs. nonrestrictive relative clauses in Chinese. *The Seventh International Conference on Chinese Linguistics*. Leiden University, Leiden.
- Lin, Jo-Wang. 2003. On restrictive and non-restrictive relative clauses in Mandarin Chinese. *Tsinghua Journal of Chinese Studies, New Series*, 33.1: 199-240.
- Link, Godehard. 1983. The logical analysis of plurals and mass terms: A lattice theoretical approach. *Meaning, use, and the interpretation of language*, ed. by Rainer Bauerle, Christoph Schwarze, and Arnim von Stechow, 302-323. Berlin: de Gruyter.
- Liou, Yu-Ruei. in preparation. Binding out of the subject. Ms., University of Connecticut.

- Liu, Chen-Sheng Luthur. 1999. *Anaphora in Mandarin Chinese and Binding at the Interface*. Irvine: UC dissertation.
- Martí, Luisa. 2003. Contextual Variables as Pronouns. *Proceedings of SALT XIII*, ed. by Robert B. Young and Yuping Zhou, 240-257. Ithaca, NY: Cornell University.
- Morzycki, Marcin. 2008. Nonrestrictive modifiers in nonparenthetical positions. *Adverbs and Adjectives: Syntax, Semantics and Discourse*, ed. by Louise McNally and Christopher Kennedy, 101-122. Oxford: Oxford University Press.
- Pan, Haihua. 1998. Closeness, prominence and binding theory. *Natural Language Linguistic Theory* 16.4: 771-815.
- Pan, Haihua. 2001. Why the blocking effect? *Long-Distance Reflexives, Syntax and Semantics 33*, ed. by Peter Cole, Gabriella Hermon, and C.-T. James Huang, 279-316. New York: Academic Press.
- Partee, H. Barbara. 1976. Some transformational extensions of Montague Grammar. *Montague Grammar*, ed. by Barbara H. Partee. New York: Academic Press.
- Partee, Barbara H., and Vladimir Borschev. 1998. Integrating lexical and formal semantics: Genitives, relational nouns, and type-shifting. *Proceedings of the Second Tbilisi Symposium on Language, Logic, and Computation*, ed. by Robin Cooper and Thomas Gamkrelidze, 229-241. Tbilisi: Tbilisi State University.
- Pollard, Carl, and Xue Ping. 1998. Chinese reflexive *ziji*: syntactic reflexives vs. nonsyntactic reflexives. *Journal of East Asian Linguistics* 7.4: 287-318.
- Runić, Jelena. 2011. Clitic Doubling in Non-Standard Serbian and Slovenian Dialects. Ms., University of Connecticut, Storrs.
- Schwarzschild, Roger. 1996. *Pluralities*. Dordrecht: Kluwer.
- Schwarzschild, Roger. 2005. Measure phrases as modifiers of adjective. *Recherches Linguistiques de Vincennes*, 35:207-228.
- Şener, Serkan. 2010. *(Non-)Peripheral Matters in Turkish Syntax*. Storrs: University of Connecticut dissertation.
- Takahashi, Masahiko. 2011. *Some theoretical consequences of Case-marking in Japanese*. Storrs: University of Connecticut dissertation.
- Tang, Chih-Chen Jane. 1990. *Chinese Phrase Structure and the Extended X-bar Theory*. Ithaca: Cornell University dissertation.
- Zhang, Niina. 2001. Sell nonrestrictive relatives. <http://www.usc.edu/schools/college/ealc//chinling/articles/appositives.pdf>
- Zwarts, Frans. 1998. Three types of polarity. *Plurality and Quantification*, ed. by Fritz Hamm and Erhard Hinrichs, 177-238. Dordrecht: Kluwer.