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Topic, Floating Quantifiers and Partitivity*

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0. Introduction

To form partitive phrases like *some of the books*, *three of the pens*, English employs *of* to somehow relate a quantifier determiner (Q-det) to an NP. Chinese does not have anything equivalent to *of* to glue the two parts together. Instead, it forms a partitive phrase by resorting to Move. In this paper I first present the relevant data and then argue that Chinese forms a partitive phrase by raising the NP to SpecTopicP to check the relevant feature and stranding its Q-det. I further show that a weak Q-det must be stranded inside, a strong Q-det outside, the VP-shell, attributing this to Diesing's (1992) Mapping Principle. Finally, I take a look at what I call covert partitive phrases and explain interesting restrictions regarding their formation in terms of Enc's (1991) theory of antecedent linking.

1. Data

In this section, let us consider the relevant facts first.

- (1) a. you yixie xuesheng chuxi-le huiyi.
exist some student attend meeting
There are some students attending the meeting.

* Special thanks are due to Norbert Hornstein. His guidance and encouragement are the best a student can get from an advisor. I would also like to thank the audience at the conference of NELS 28 for their comments and suggestions. Of course, any shortcomings are my own responsibility.

- b. xuesheng you yixie chuxi-le huiyi.
student exist some attend meeting
Some of the students have attended the meeting.
- (2) a. you xuduo xuesheng chuxi-le huiyi.
exist many student attend meeting
There are many students attending the meeting.
- b. xuesheng you xuduo chuxi-le huiyi.
student exist many come meeting
Many of the students have attended the meeting.
- (3) a. mei you yi-ge xuesheng chuxi huiyi.
not exist one CL student attend meeting
There is no student attending the meeting.
- b. xuesheng mei you yi-ge chuxi huiyi.
students not exist one CL attend meeting
None of the students have attended the meeting.

Of concern to us is the relative order of the subject NP and its Q-det in each pair. In all the *a* sentences the Q-det precedes its associated NP, the normal order for a quantified phrase. In all the *b* sentences the NP precedes its Q-det with some intervening material. There are some interesting, though subtle, meaning differences between the *a* sentences and their *b* counterparts.

First, consider the pair in (1). (1a) quantifies over a set of students, whereas (1b) quantifies over a contextually fixed set of students. Put differently, in the latter, but not in the former, the set of students has already been established as a topic in the previous discourse. To better appreciate the difference between the two, let us say that there are 5 students having attended the meeting, and that this number turns out to be all the students there are in the domain. In such a situation the speaker might very well utter (1a), but not (1b). Therefore, (4a) is a logically coherent assertion, but (4b) is not.

- (4) a. you yixie xuesheng chuxi-le huiyi, shishishang, suoyou de xuesheng dou chuxi-le.
exist some student attend meeting in fact all DE student all attend
Some students have attended the meeting, in fact, all the students have attended it.
- b. *xuesheng you yixie chuxi-le huiyi, shishishang, suoyou de xuesheng dou chuxi-le.
student exist some attend meeting in fact all DE student all attend
Some of the students have attended the meeting, in fact, all of them have attended it.

This is so because by saying (1b) the speaker has somehow linked *students* to the preestablished topic. In other words, he does not just implicate, but asserts that *Not all the students have attended the meeting*. Thus, he cannot continue to say *in fact, all of the students have attended the meeting* without contradicting himself. This explains why (4b) is unacceptable. In contrast, by saying (1a) the speaker merely introduces *some students* into the discourse. He may implicate that *Not all the students have attended the meeting*, but does not commit himself to the truth of it. He may very well cancel this implicature if it turns out that all the students in the domain have attended the meeting. Remember that *Some students*

have attended the meeting will hold true in the situation in which *All the students have attended the meeting* is true. This is why the speaker of (4a) does not commit self-contradiction when he “self-corrects.”

Second, consider the pair in (2) where the Q-det is proportional. The meaning difference between the two is even more interesting. In (2a) the Q-det *xuduo* (many) precedes its associated NP *xuesheng* (student), while the same Q-det in (2b) follows its associated NP. (2a) is interpreted as meaning that the number of students having attended the meeting is “many” in proportion to all the people having attended the meeting, whereas (2b) is interpreted as meaning that the number of students having attended the meeting is “many” in proportion to a contextually determined set of students. To see this subtle difference, let us say that 6 out of 10 counts as “many”, and let us suppose that there are 40 students and only 6 of them have attended the meeting, and further suppose that the total number of people having attended the meeting, including these 6 students, is 10. Given this scenario, (2a) turns out to be true, whereas (2b) is false. This is so because in (2b) *xuesheng* (student) is discourse-linked, i.e. linked to the set of 40 students in this scenario. By saying (2b) the speaker is taking the number of students having attended the meeting in proportion to this 40-student set. As 6 out of 40 does not count as “many” by our measure, the sentence therefore is false.

Third, consider the pair in (3) where the Q-det involved is negative. To see how they differ, let us first take a look at how we verify the truth value of a negatively quantified sentence like (3a): We first take a set of students and a set of people having attended the meeting, and then intersect them. If the set resulting from this intersection is empty, the sentence is true; otherwise it is false. The following is its formalism.

$$(5) \quad \{y: y \text{ is a student}\} \cap \{x: x \text{ is a person having attended the meeting}\} = \emptyset$$

What concerns us is: in the case of (3a) the student-set can be empty. If the set is empty, the sentence will come out true because the intersection of an empty set with any set returns an empty set. What this means is (3a) does not presuppose that there exist students. For this reason, the following sentence makes perfect sense.

- (6) *mei you yi-ge xuesheng chuxi huiyi, yinwei mei you xuesheng.*
 not exist one CL student attend meeting because not exist student
 There is no student attending the meeting because there are no students.

Saying *There is no student attending the meeting* does not presuppose that there exist any students in the domain. Thus, the non-existence of students can be cited as a good reason why there is no student attending the meeting. In contrast, saying (3b) (where the NP precedes the negative Q-det) does presuppose the existence of students in the domain. That is to say, for (3b) the student-set cannot be empty, which is why an assertion like (7) is self-contradictory: the first clause presupposes the existence of students, but the second one denies this very presupposition.

- (7) *xuesheng mei you yi-ge chuxi huiyi, yinwei mei you xuesheng.
 students not exit one CL attend meeting because not exist student
 *None of the students have attended the meeting because there are no students.

Finally, a similar kind of meaning distinction can be drawn for the case where the Q-det involved is numeral. Consider the following pair.

- (8) a. you liang-ge xuesheng chuxi-le huiyi.
 exist two CL student attend meeting
 There are two students attending the meeting.
 b. xuesheng you liang-ge chuxi-le huiyi.
 student exist two CL attend meeting
 Two of the students have attended the meeting.

In (8a) the numeral precedes the NP while in (8b) the order is reversed. The subject NP in (8b), unlike that in (8a), refers to a contextually fixed set of students, and importantly this set must contain more than two members in the case at hand. This is why (9) is not a possible continuation of (8b), but is of (8a) if it happens that there are only two students in the domain.

- (9) ye jiu shi shuo, suoyou de xuesheng dou chuxi-le huiyi.
 also then be speak all DE student all attend meeting
 In other words, all of the students have attended the meeting.

The examples we have discussed so far involve quantified NPs in subject position. It must be pointed out that the same is true of quantified NPs in object position. Let us look at the following pairs.

- (10) a. Zhangsan chi-le yixie juzi.
 Zhangsan eat some orange
 Zhangsan has eaten some oranges
 b. juzi Zhangsan chi-le yixie.
 orange Zhangsan eat some
 Zhangsan has eaten some of the oranges.
- (11) a. Zhangsan chi-le xuduo juzi.
 Zhangsan eat many orange
 Zhangsan has eaten many oranges.
 b. juzi Zhangsan chi-le xuduo.
 orange Zhangsan eat many
 Zhangsan has eaten many of the oranges.
- (12) a. Zhangsan chi-le liang-ge juzi.
 Zhangsan eat two CL orange
 Zhangsan has eaten two oranges.
 b. juzi Zhangsan chi liang-ge.
 orange Zhangsan eat two CL
 Zhangsan has eaten two of the oranges.

In all the *a* sentences the Q-det immediately precedes its NP, while in all the *b* sentences the Q-det stays in object position and its associated NP appears in sentence-initial position. The semantic distinction between the *a*-sentence and its *b*-counterpart can be drawn very much along the same lines discussed above.

2. Partitivity by Movement

It is clear from the above discussion that when an NP is separated from its associated Q-det, the quantified phrase thus formed is partitive. In set-theoretic terms, a partitive phrase denotes a family of sets consisting of a superset and its subset. Take *some of the students* for example. *The students* denotes the superset, *some* its subset. What is important for the purpose of this paper is that the superset part of a partitive phrase must be definite (or specific), a constraint that rules out a partitive phrase like *some of students* where the superset part is a bare plural (indefinite).¹ Given this I argue that the NP in a partitive phrase, unlike that in a nonpartitive one, must be discourse-linked. Take the following pair for example.

- (13) a. John has read some of the books
b. John has read some books.

(13a) cannot be uttered out of the blue. In other words, there must be some mention of books in the previous discourse for *the books* to link to. (13b), on the other hand, does not have such a requirement.

In this light, I propose the *b* sentence is derived from its corresponding *a* sentence by topicalizing the superset part and stranding its subset part. Assuming that the word *you* (exist) marks the left edge of VP, in sentences like (1b, 2b, 3b) the NP raises from VP-internal subject position to SpecTopicP to check the topic feature, leaving its Q-det in situ, as illustrated in (14) for (1b).

- (14) [_{TopicP} xuesheng_i [_{VP} you yixie t_i [_{V'} chuxi-le huiyi]]]
student exit some attend meeting

In a similar fashion, for sentences like (10b, 11b, 12b) the NP raises from object position to SpecTopicP to check the topic feature, leaving its Q-det behind, as illustrated in (15) for (10b).

- (15) [_{TopicP} juzi_j [_{AgSP} Zhangsan_i [_{VP} t_i [_{V'} chi-le yixie t_j]]]]²
orange Zhangsan eat some

¹ Enc (1991) distinguishes specificity from definiteness in terms of antecedent linking. For the purpose of this paper this distinction is not that important.

² I assume that a subject NP in Chinese raises to SpecAgSP, without further discussion.

This analysis is very much reminiscent of Sportiche's (1988) account of floating quantifiers in French. Sportiche attempts to capture the relation between *tous* (all) and *les enfants* (the children) in a sentence like (16) where *les enfants* precedes *tous* and the auxiliary verb *ont* (have) intervenes in between.

- (16) Les enfants ont tous vu ce film.
the children have all seen this movie.

Sportiche argues that (16) is derived from (17) by raising the subject NP *les enfants* from what he calls the NP* position (the canonical subject position of VP, analogous to SpecVP position) to SpecIP and stranding *tous* behind, as illustrated in (18).

- (17) Tous les enfants ont vu ce film.
all the children have seen this movie.
(18) [_{IP} les enfants_i [_{I'} ont [_{V_n} tous t_i [_{VP} vu ce film]]]]
the children have all see this movie

But, there is some fundamental difference between French and Chinese with respect to quantifier floating. For French this is an A-movement and is thus subject to locality conditions. As pointed out by Sportiche, the following sentence where the NP is not in the same clause containing its Q-det is ungrammatical.

- (19) * [_{IP} Les enfants l'ont persuade [_{IP} de tous acheter ce livre]
the children him-have persuade Comp all buy this book

But for Chinese this movement is not subject to any locality condition. The NP and its Q-det can be separated from each other by one or more clauses. Consider (20).

- (20) a. [_{TopicP} juzi [_{IP} Zhangsan shuo [_{IP} Lisi chi-le yixue t_i]]]
orange Zhangsan say Lisi eat some
Zhangsan said that Lisi has eaten some of the oranges.
b. [_{TopicP} juzi [_{IP} wo jide [_{IP} Zhangsan shuo [_{IP} Lisi chi-le san-ge t_i]]]]
orange I remember Zhangsan say Lisi eat three CL
I remember that Zhangsan said that Lisi has eaten three of the oranges.

The preposed NP can be related to its downstairs Q-det despite some intervening IP-nodes, as shown by (20a, b). I take this to mean that this is A-bar movement, an instance of topicalization.

Xu and Langendoen (1985), among others, argue that topicalization in Chinese is in fact left-dislocation. That is, the topic is a left-dislocated NP associated with a resumptive pronoun in the sentence. But there is some evidence to suggest the topicalization under discussion involves movement. First, it exhibits island effects.

- (21) a. *xuesheng_i Zhangsan bu gaoping [_{Adjunct Clause} yinwei you yixue t_i mei lai]
 student Zhangsan not happy because exist some not come
 Zhangsan is not happy because some of the students have not come.
- b. *shu_i wo bu xiangxin [_{Complex NP} Zhangsan du-le san-ben t_i de shuofa]
 book I not believe Zhangsan read three CL DE claim
 I don't believe the claim that Zhangsan has read three of the books.

The topic cannot be associated with its Q-det in an adjunct island (21a), nor can it be associated with its Q-det in a complex NP island (21b).

Second, unlike some topic sentences where the gap can be spelled out by a resumptive pronoun, as shown by (22), this type of sentence does not allow its gap to be filled by a resumptive pronoun, as shown by (23).

- (22) zhe-ge xuesheng wo xihuan (ta)
 this CL student I like him/her
 This student I like him/her.
- (23) xuesheng you yixue *(tamen) chuxi-le huiyi
 student exist some them attend meeting
 Lit. The students, there are some of them attending the meeting.

Of course, one could argue that the resumptive pronoun is null in (23), but one would still need to explain why the resumptive pronoun is obligatorily null in (23) but not in (22). Also, the potential danger of pushing such a line of argument is that we may lose the diagnostics we use to distinguish left-dislocation from topicalization. Given these considerations, I hold that the topicalization here involves movement: the NP raises from the position following its Q-det to SpecTopicP to check the topic feature, thereby stranding its Q-det in situ.

If the NP undergoes topicalization, why does its associated Q-det not go along with it? Or to put the question differently, why must the NP part company with its associated Q-det during the derivation?

Note that *yixie* (some), *xuduo* (many), *mei you yi* (none) and numerals are weak quantifiers on Barwise and Cooper's (1981) classification, and they are interpreted as indefinite. According to Diesing's (1992) Mapping Principle, a definite must occupy a VP-external position and an indefinite a VP-internal position. Let us reformulate this principle as follows.

- (24) Mapping Principle
 Definites must be outside, and indefinites must be inside the VP-shell.

Given that the NP of a partitive phrase is definite and its associated weak Q-det is indefinite, it follows from this principle that they must somehow part company with each

other during the derivation.³ This leads to the next question--whether a strong Q-det can be stranded as such-- to which we will turn now.

3. A Strong Quantifier Cannot be Stranded Inside the VP-Shell

As expected, strong Q-dets like *mei* (every) and *dabufen* (most) cannot be stranded in the same position that weak Q-dets are. In (25 a, b) *mei-ben* and *dabufen* are left behind in the postverbal object position when the associated NP moves to SpecTopicP, and the resulting sentences are unacceptable.

- (25) a. *shu Zhangsan du-le mei-ben
 book Zhangsan read every CL
 Zhangsan has read everyone of the books.
 b. *shu Zhangsan du-le dabufen.
 book Zhangsan read most
 Zhangsan has read most of the books.

A strong quantifier has a very different syntax and semantics from a weak one. The most noticeable distinction between the two is that the former is not able to appear in an existential sentence but the latter is. I assume that a strong quantified NP is definite (specific), that is, the NP associated with a strong Q-det must be presuppositional. A sentence like *I have read every book*, if uttered without the previous mention of books, is odd at best. If a strong Q-det is definite, then it must be, according to the Mapping Principle formulated in (24), outside the VP-shell. This explains the unacceptability of sentences like (25).⁴

³ A question which I don't have a good answer to is why in English both parts of a partitive phrase stay inside the VP, i.e., why in a sentence like *John has read some of the books* the superset NP does not move out of the VP-shell. I guess it might have to do with the fact that English has this dummy case marker *of* and it must discharge its Case feature to its following NP. I assume without discussion that *the books* here raises at LF to SpecTopic, stranding *some* in situ. That is, the English sentence has the same LF-form as its Chinese counterpart.

⁴ It appears that the reverse is true in English: Strong Q-dets like *all* and *each* can float, whereas weak ones like *some* and *many* cannot.

- (i) The children have all seen the movie.
 (ii) The children have each seen the movie.
 (iii) *The children have some seen the movie.
 (iv) *The children have many seen the movie.

There are two points I want to make here. First, it is not clear whether *all* or *each* is stranded by the movement of an associated NP or whether they are just base-generated adverbs. Even if we take the movement analysis, it is still possible for the entire quantified NP to move out of VP to some functional projection (DisP perhaps) before stranding takes place. I will leave the issue open. Second, I want to point out that in some informal dialect of English the following sentences are acceptable.

- (v) We be many of us cut off before we come to olde age. (From the OED)
 (vi) They are none of them very enthusiastic. (Quirk et. al, 1985: 1399)

So it is not entirely true that a weak D-det cannot float. Rather, when it floats the gap must be spelled out by

However, a strong Q-det can be stranded as long as it somehow gets out of the VP-shell before Spell-out. Look at (26).

- (26) a. shu Zhangsan mei-ben dou du-le
 book Zhangsan every CL all read
 Zhangsan has read everyone of the books.
 b. shu Zhangsan dabufen dou du-le.
 book Zhangsan most all read
 Zhangsan has read most of the books.

In (26a, b) *mei-ben* and *dabufen* appear to the left of *dou* (all) which, as I argue elsewhere (Wu, 1996), is a head of DisP (Distributional Phrase), a functional projection above VP.⁵ The following is the derivation of (26a), for example.

- (27) a. [_{DisP} mei-ben shu_i [_{Dis'} dou [_{VP} Zhangsan du-le t_i]]]
 every CL book all Zhangsan read
 b. [_{AgrsP} Zhangsan_j [_{DisP} mei-ben shu_i [_{Dis'} dou [_{VP} t_j du-le t_i]]]]
 Zhangsan every CL book all read
 c. [_{TopicP} shu_k [_{AgrsP} Zhangsan_j [_{DisP} [mei-ben t_k]_i [_{Dis'} dou [_{VP} t_j du-le t_i]]]]]]
 book Zhangsan every CL all read

After the VP is constructed, *dou* is introduced into the derivation to project DisP whose feature is strong and must be checked off before any further step can be taken. It is checked off by *mei-ben shu* (every book) raising to its Spec, as shown in (27a). Then in (27b) the subject *Zhangsan* raises from the VP-internal subject position to SpecAgrsP. Finally, in (27c) the NP *shu* (book) moves further to SpecTopicP, thereby stranding its Q-det *mei-ben* in SpecDisP.

For the same reason, a strong Q-det cannot be stranded in a VP-internal subject position. The sentences in (28) are not acceptable.

- (28) a. *xuesheng you mei-ge chuxi-le huiyi
 student exist every CL attend meeting
 Every one of the student have attended the meeting
 b. *xuesheng you dabufen chuxi-le huiyi
 student exist most attend meeting
 Most of the students have attended the meeting

some sort of resumptive pronoun. I don't know what to make out of this data.

⁵ In Wu (1996) I show that by postulating this functional projection we can first of all explain why *dou* only quantifies an NP to its left, for an NP must overtly move to SpecDisP for feature checking. Secondly, we can explain why only definites (strong quantified phrases or plural definite phrases) can be quantified by *dou*: they are quantificationally strong and therefore match *dou* for feature-strength.

To avoid this, the strong Q-det can first move to SpecDisP along with its associated NP, and then be stranded there by its associated NP moving further to SpecTopicP, as shown in (29).

- (29) a. *xuesheng mei-ge dou chuxi-le huiyi*
 student every CL all attend meeting
 Every one of the student have attended the meeting
 b. *xuesheng dabufen dou chuxi-le huiyi*
 student most all attend meeting
 Most of the students have attended the meeting

(30) is the partial derivation of (29a): In (30a), *mei-ge xuesheng* (every student) first raises from the VP-internal subject position to SpecDisP, and subsequently the NP raises further to SpecTopicP, stranding its Q-det in SpecDisP (30b). The output of this derivation meets the Mapping Principle.

- (30) a. [_{DisP} *mei-ge xuesheng*_i [_{Dis'} *dou* [_{VP} *t_i chuxi-le huiyi*]]]
 every CL student all attend meeting
 b. [_{TopicP} *xuesheng*_j [_{DisP} [*mei-ge t_j*]_i [_{Dis'} *dou* [_{VP} *t_i chuxi-le huiyi*]]]]]
 student every CL all attend meeting

Of interest to us is the fact that a numeral Q-det not only can remain inside the VP, as shown by examples (8b) and (12b), but can also move out of the VP, as shown by the examples below.

- (31) a. *xuesheng san-ge dou chuxi-le huiyi*
 student three CL all attend meeting
 All three students have attended the meeting
 b. *juzi Zhangsan liang-ge dou chi-le*
 orange Zhangsan two CL all eat
 Zhangsan has eaten both oranges.

In (31) the numeral Q-det appears to the left of *dou*, that is, in SpecDisP. I assume that (31a,b) are derived in the same way as (26) and (29), i.e. the numeral quantified NP in its entirety first raises to SpecDisP, and the NP then raises further to SpecTopicP leaving its Q-det stranded in SpecDisP.

Does this derivation violate the Mapping Principle?. No, it does not, because a numeral Q-det can be interpreted as either indefinite or definite, depending on whether it is inside or outside the VP-shell. For example, the numeral Q-det *liang-ge* (two) in (12b) stranded inside VP is indefinite in the sense that its associated NP *juzi* (orange) denotes a set containing more than two oranges and *liang-ge* (two) denotes any two-member combination within this superset. However, the same numeral Q-det in (31b) stranded outside the VP (SpecDisP) is definite in the sense that its associated NP denotes a set

containing exactly two oranges and the Q-det denotes the very same two-orange set.⁶

One apparent problem to the above analysis is that a strong quantified NP in its entirety can stay inside VP, as shown below.

- (32) a. Zhangsan du-le mei-ben shu.
 Zhangsan read every CL book
 Zhangsan has read everyone of the books.
 b. Zhangsan du-le dabufen shu.
 Zhangsan read most book
 Zhangsan has read most of the books.

If strong quantified NPs like *mei-ben shu* (every book) and *dabufen shu* (most books) are interpreted as definite, and if definites have to be outside the VP to meet the Mapping Principle, then why are sentences (32a, b) perfectly acceptable?

I argue that quantified object NPs like those in (32) undergo an obligatory LF-movement out of the VP-shell by a “last-resort” operation to SpecTopicP. The following is the LF-representation of (32a).

- (33) [_{TopicP} mei-ben shu_j [_{AgrsP} Zhangsan_i [_{VP} t_i du-le t_j]]]
 every CL book Zhangsan read

An immediate question one may ask is: If a strong quantified NP can escape the VP-shell at LF, why can't the stranded strong Q-dets in (25) do the same? For example, for (25a) why can't we LF-move the stranded Q-det *mei-ben* (every) to adjoin to its already moved NP *shu* (book) as shown in (34)?

- (34) a. [_{TopicP} shu_j [_{AgrsP} Zhangsan_i [_{VP} t_i du-le mei-ben t_j]]]
 book Zhangsan read every CL
 b. [_{TopicP} mei-ben_k [_{TopicP} shu_j [_{AgrsP} Zhangsan_i [_{VP} t_i du-le t_k t_j]]]]
 every CL book Zhangsan read

I argue that this LF-movement is blocked due to the Principle of Economy. Following Hitahara (1997), I define the Principle of Economy in terms of the Shortest Derivation Condition.

⁶ It is interesting to point out that there is another route to derive sentences like (26, 29, 31). Take (26a) for example, we can first move the NP *shu* (book) directly to SpecTopicP, leaving its Q-det *mei-ge* (every) stranded in the postverbal object position and then move the stranded Q-det to SpecDisP. This derivation, though involving the same number of steps as the one in (27), is illegitimate, because it is noncyclic, i.e. after the NP has moved to SpecTopicP, the stranded Q-det cannot move to any category lower than TopicP; otherwise it would violate the Extension Condition to the effect that a Generalized Transformation must extend the entire phrase structure.

- (35) Shortest Derivation Condition (SDC)
Minimize the number of operations necessary for convergence.

That is, among the derivations that converge choose the one that employs the fewest operations. To determine the comparison domain for the purpose of economy, Chomsky (1995) suggests that derivations are only comparable with each other when they are in the same reference set. Chomsky defines a reference set as a set consisting of derivations that arise from the same numeration. He characterizes Numeration as follows:

- (36) Numeration
A numeration is a set of pairs (l, n) , where l is an item of the lexicon and n is its index, understood to be the number of times that l is selected.

According to these definitions, (33) and (34) are comparable for the purpose of economy, as they share the same numeration and are assumed to output the same LF-object. However, (34) is less economical as it employs two operations to get the strong quantified NP out of the VP-shell: the overt one that moves the NP to SpecTopicP and the covert one that moves the stranded Q-det to adjoin to its already moved NP. (33), on the other hand, employs only one covert operation to achieve the same purpose. So, the LF-movement in (34) is disallowed not because the derivation does not converge, but because it is less economical than the one in (33) and, thus, is blocked by the latter.

4. Covert Partitive Phrases

In this section I explore another related phenomenon. Let us start our discussion by considering the following pair of sentences.

- (37) a. Lisi du-le san-ben shu
Lisi read three CL book
Lisi has read three books
b. Lisi du-le san-ben [e]
Lisi read three CL (book)
Lisi has read three (of the books)

The minimal difference between the two is: the quantified NP in (37a) consists of the numeral and NP (henceforth referred to as the complete numeral NP), but the one in (37b) consists of the numeral and an empty NP (henceforth referred to as the truncated numeral NP). The complete one in (37a) represents a piece of new information, but the truncated one must be antecedently linked, that is, for (37b) to be acceptable, there must be some mention of books in the previous discourse. Consider the following pair.

- (38) a. *Zhangsan kan-le liu-chang dianying, Lisi du-le san-ben [e]
Zhangsan see six CL movie Lisi read three CL (book)
Zhangsan has seen six movies and Lisi has read three of the books.

- b. Zhangsan jie-le liu-ben shu, Lisi du-le san-ben [e]
 Zhangsan borrow six CL book, Lisi read three CL (book)
 Zhangsan has borrowed six books and Lisi has read three (of them).

(38a) is unacceptable because the truncated numeral NP in the second clause cannot link to *liu-chang dianying* (six movies) in the first. (38b) is acceptable because the same NP can link to *liu-ben shu* (six books) in its preceding clause.

Given the fact that a truncated numeral NP must be antecedently linked, I argue that we can treat it as a covert partitive phrase. I propose that for a sentence like (37b) there is a null NP that is base-generated in the position following its numeral and then moved to SpecTopicP to check the topic feature in the same fashion as the NPs are in sentences like (1b, 2b, 3b, 8b, 10b, 11b, 12b). Thus, the following is the relevant part of its derivation.

- (39) a. [_{AgSP} Lisi_i [_{VP} t_i du-le san-ben [e]]]
 Lisi read three CL (book)
 b. [_{TopicP} [e]_j [_{AgSP} Lisi_i [_{VP} t_i du-le san-ben t_j]]]
 (book) Lisi read three CL

In (39a) the subject *Lisi* raises to SpecAgSP and then in (39b) the null NP raises to SpecTopicP.

Even more interesting is: sentence (37b), though good in (38b), cannot be used in (40) where the the number of books that *Zhangsan* has borrowed is identical with the number of books *Lisi* has read.

- (40) *Zhangsan jie-le san-ben shu, Lisi du-le san-ben [e]
 Zhangsan borrow three CL book Lisi read three CL (book)
 Zhangsan has borrowed three books and Lisi has read three (of them).

What this indicates is that the previous set that the truncated numeral NP is linked to must be larger than the set denoted by the stranded numeral. The question, then, is why.

Enc (1991) proposes that both definite NPs and partitive NPs must be antecedently linked. She distinguishes a definite NP from a partitive NP in terms of how they are antecedently linked: A definite NP is linked to its antecedent under the condition of **identity**, a partitive NP to its antecedent under the condition of **inclusion**. To illustrate this point with the following English examples.

- (41) a. There is a boy entering the room. The boy is wearing a blue hat.
 b. There were five boys entering the room. John knows two of them.

The boy in (41a) is a definite NP and has *a boy* in the preceding sentence as its antecedent. They are coreferential under the condition of identity. *Two of them* in (41b) is a partitive phrase and has *five boys* in the preceding sentence as its antecedent. *Two of them* is not

identical with *five boys*, but not disjoint with it, either. Instead, it is included in *five boys*. *Two of them* is not fixed for its reference as to which two boys among this five-boy set it denotes. To be exact, it is *them*, rather than *two of them*, that is antecedently linked to *five boys*. This ensures that *two* receives an indefinite interpretation, as it should.

In light of Enc's theory of antecedent linking, it is clear why sentence (37b) can be used in (38b) but not in (40); for in (40) the cardinality of books denoted by the numeral quantified phrase in the first clause is identical with that denoted by the stranded numeral in the second, that is, they are not linked under the condition of inclusion, but rather under the condition of identity. This means that the stranded numeral here is definite rather than indefinite. By being definite, it is not supposed to stay inside the VP-shell because, as pointed out earlier, a numeral, if stranded inside the VP, must be interpreted as indefinite. So (40) violates the Mapping Principle.

If this analysis is correct, it predicts that if the stranded numeral in (40) can somehow move out of the VP-shell, the sentence will be acceptable. This prediction is indeed borne out.

- (42) Zhangsan jie-le san-ben shu, Lisi san-ben dou du-le
 Zhangsan borrow three CL book, Lisi three CL all read
 Zhangsan has borrowed three books and Lisi has read all three of them.

I assume the following derivation for the second clause of (42). The truncated numeral NP raises to SpecDisP (43a), followed by the subject NP moving to SpecAgrsP (43b) and finally in (43c) the null NP undergoes further movement to SpecTopicP, stranding its numeral in SpecDisP.

- (43) a. [_{DisP} [san-ben [e]]_i [_{Dis'} dou [_{VP} Zhangsan du-le t_i]]]
 three CL (book) all Zhangsan read
 b. [_{AgrsP} Zhangsan_j [_{DisP} [san-ben [e]]_i [_{Dis'} dou [_{VP} t_j du-le t_i]]]]
 Zhangsan three CL (book) all read
 c. [_{TopicP} [e]_k [_{AgrsP} Zhangsan_j [_{DisP} [san-ben t_k]]_I [_{Dis'}s dou [_{VP} t_j du -le t_i]]]]]
 (book) Zhangsan three CL all read

5. Summary

In this paper I argue that in Chinese a partitive phrase is formed by raising the NP to SpecTopicP and stranding its Q-det. I show that a weak Q-det must be stranded inside, and a strong Q-det outside, the VP-shell. I attribute this to Diesing's (1992) Mapping Principle that requires that an indefinite stay inside, and a definite outside, the VP-shell. I further show that a truncated numeral NP (with its NP being null) can be either stranded inside or outside the VP, depending on whether it is linked to its antecedent by inclusion (partitive) or by identity (definite).

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