





- (7) [<sub>NP</sub> Zai canting dagong de xuesheng ] gaosu Lisi nali de dangao bucuo.  
 at dining-hall work de student tell Lisi there de cake not-bad  
 'A/Some student(s) working at the dining-hall told Lisi that cake there is pretty good.'  
 'The student(s) working at the dining-hall told Lisi that cake there is pretty good.'

MOD-*de* may also precede or follow quantificational phrases (QP) containing quantificational words such as *mei* 'every', as in (8), but the difference in the order of MOD-*de* and *mei-tang* 'every-cl', on a superficial examination, does not seem to correlate with a difference in truth-conditions.

- (8) a. [<sub>NP</sub> QP MOD-*de* N']  
 mei-tang shangwu qu Badaling de lieche zai Shahezhen  
 every-cl morning go Badalingde train at Shahezhen  
 ting wu-fenzhong.  
 stop five-minute  
 'Every train going to Badaling in the morning stops at Shahezhen for five minutes.'
- b. [<sub>NP</sub> MOD-*de* QP N']  
 Shangwu qu Badaling de mei-tang lieche zai Shahezhen  
 morning go Badaling de every-cl train at Shahezhen  
 ting wu-fenzhong.  
 stop five-minute  
 'Every train going to Badaling in the morning stops at Shahezhen for five minutes.'

While the focus of this paper is on the interpretation of NPs containing numerals and MOD-*de*, an adequate account needs to be able to account for cases like (6), (7) and (8) as well.

In the following I first show that when MOD-*de* precedes MP in the NP, definite-only readings of the NPs pattern with a number of syntactic categories in MOD-*de*, whereas when MP precedes MOD-*de*, both definite and indefinite readings are in principle possible with all categories in MOD-*de*. I then propose an analysis to account for the patterns observed. I need to point out that the generalizations argued for in this paper do not carry over to NPs in predicative positions or with emphatic stress. For example, an NP like *a student* in *Lisi is a student*, or NPs with emphatic stress, e.g., *shangwu qu Badaling de LIANG-TANG lieche* 'TWO trains going to Badaling in the morning', may not fit the patterns here.

## 2. The syntactic category combining with *de* and definite-only readings of the NPs

### 2.1. [<sub>NP</sub> MOD-de MP N'] with definite-only readings

The examples in (9) illustrate the kind of contrasts used in determining whether an NP has only a definite reading or not. By (9a), there are four trains going to Badaling in the morning. Adding (9b) to (9a) means two out of the four trains going to Badaling in the morning have already been dispatched. But adding

(9c) results in an infelicitous discourse. The only reading for (9c) is that there are just two trains going to Badaling in the morning, and this is at odds with (9a), which states that there exist four such trains. The infelicity resulting from continuing (9a) with (9c) makes it clear that the NP in (9c) with VP-*de* preceding MP has a definite reading only.

- (9) a. Shangwu you si-tang lieche qu Badaling.  
 morning have four-cl train go Badaling  
 'In the morning there are four trains going to Badaling.'
- b. [<sub>NP</sub> MP MOD-*de* N' ]  
 Liang-tang shangwu qu Badaling de lieche yijing fachuqule.  
 two-cl morning go Badaling de train already dispatched  
 'Two trains going to Badaling in the morning have already been dispatched.'
- c. #[<sub>NP</sub> MOD-*de* MP N' ]  
 Shangwu qu Badaling de liang-tang lieche yijing fachuqule.  
 morning go Badaling de two-cl train already dispatched  
 'The two trains going to Badaling in the morning have already been dispatched.'

If we have (9a') instead of (9a), then both (9b) and (9c) may follow (9a') felicitously. The subject NPs in both (9b) and (9c) may be understood as anaphorically related to the two trains mentioned in (9a'), i.e., they may have the definite reading 'the two trains going to Badaling in the morning'. This again shows that NPs with the order [<sub>NP</sub> VP-*de* MP N'] have definite readings. It also shows that NPs with the order [<sub>NP</sub> MP VP-*de* N'] may have definite readings as well.

- (9) a'. Shangwu you liang-tang lieche qu Badaling.  
 morning have two-cl train go Badaling  
 'In the morning there are two trains going to Badaling.'
- b. [<sub>NP</sub> MP MOD-*de* N' ]  
 Liang-tang shangwu qu Badaling de lieche yijing fachuqule.  
 two-cl morning go Badaling de train already dispatched  
 'The two trains going to Badaling in the morning have already been dispatched.'

In (10), MOD-*de* is an NP-*de* which is not a possessive. According to (10a), five of the ten birds in the cage have black tails. (10b) may follow (10a) felicitously, but (10c) is infelicitous after (10a). (10c) may be used felicitously only if the number of black-tailed birds that are salient in the context is just two, i.e., it has a definite reading only.

- (10) a. Longzi li you shi-zhi niao, qizhong wu-zhi weiba shi hei de.  
 cage in have ten-cl bird among-which five-cl tail be black de  
 'In the cage are ten birds, among which five have tails that are black.'
- b. [<sub>NP</sub> Liang-zhi heiweiba de niao ] hai hen xiao, bu hui fei.  
 two-cl black-tail de bird still very young not can fly  
 'Two birds with black tails are still very young and cannot fly.'

- c. #<sub>[NP</sub> Heiweiba de liang-zhi niao ] hai hen xiao, bu hui fei.  
 black-tail de two-cl bird still very young not can fly  
 'The two birds with black tails are still very young and cannot fly.'

If we replace (10a) with (10a'), then both (10b) and (10c) follow (10a') felicitously. In particular, it is possible to understand the NPs as referring back to the two black-tailed birds mentioned in (10a'). Therefore, [<sub>NP</sub> NP-*de* MP N'] has only a definite reading while both definite and indefinite readings are possible with [<sub>NP</sub> MP NP-*de* N'].

- (10) a'. Longzi li you shi-zhi niao, qizhong liang-zhi weiba shi hei de.  
 cage in have ten-cl bird among-which two-cl tail be black de  
 'In the cage are ten birds, among which two have tails that are black.'  
 b. [<sub>NP</sub> Liang-zhi heiweiba de niao ] hai hen xiao, bu hui fei.  
 two-cl black-tail de bird still very young not can fly  
 'The two birds with black tails are still very young and cannot fly.'

## 2.2. [<sub>NP</sub> MOD-*de* MP N'] with definite and indefinite readings

### 2.2.1. NP-*de* MP N' (with possessive NP-*de*)

Example (11) is similar to (10) in the sense that MOD-*de* is NP-*de*. Unlike in (10), however, NP-*de* is now possessive. Sentence (11a) says that five of the ten birds in the cage are Zhangsan's. Both (11b) and (11c) may follow (11a) felicitously with the interpretation that there are two birds that are Zhangsan's that are still very young and cannot fly. In either case, Zhangsan is assumed to have more than two birds, given (11a). Therefore, unlike the cases of [<sub>NP</sub> NP-*de* MP N'] observed in (10) with a non-possessive NP-*de*, [<sub>NP</sub> NP-*de* MP N'] with a possessive NP-*de* has a reading that is not definite here.

- (11) a. Longzi li you shi-zhi niao, qizhong wu-zhi shi Zhangsan de.  
 cage in have ten-cl bird among-which five-cl be Zhangsan de  
 'In the cage are ten birds, among which five are Zhangsan's.'  
 b. [<sub>NP</sub> Liang-zhi Zhangsan de niao ] hai hen xiao, bu hui fei.  
 two-cl Zhangsan de bird still very young not can fly  
 'Two birds that are Zhangsan's are still very young and cannot fly.'  
 c. [<sub>NP</sub> Zhangsan de liang-zhi niao ] hai hen xiao, bu hui fei.  
 Zhangsan de two-cl bird still very young not can fly  
 'Two birds that are Zhangsan's are still very young and cannot fly.'

If we replace (11a) with (11a'), then both (11b) and (11c) may follow (11a') felicitously with a definite reading referring back to the two birds that are Zhangsan's in (11a').

- (11) a'. Longzi li you shi-zhi niao, qizhong liang-zhi shi Zhangsan de.  
 cage in have ten-cl bird among-which two-cl be Zhangsan de  
 'In the cage are ten birds, among which two are Zhangsan's.'  
 b. [<sub>NP</sub> Liang-zhi Zhangsan de niao ] hai hen xiao, bu hui fei.  
 two-cl Zhangsan de bird still very young not can fly  
 'The two birds that are Zhangsan's are still very young and cannot fly.'

- c. [<sub>NP</sub> Zhangsan de liang-zhi niao ] hai hen xiao, bu hui fei.  
 Zhangsan de two-cl bird still very young not can fly  
 'The two birds that are Zhangsan's are still very young and cannot fly.'

Cases like (12) provide further evidence that [<sub>NP</sub> NP-*de* MP N'] with the possessive NP-*de* may have indefinite interpretations. (12a) with [<sub>NP</sub> MP NP-*de* N'] seems to convey a sense of contrast, e.g., Zhangsan's fingers compared to someone else's; (12b) [<sub>NP</sub> NP-*de* MP N'] lacks this contrastive implication and sounds more natural than (12a) in non-contrastive contexts.

- (12) a. #[<sub>NP</sub> San-zhi Zhangsan de shouzhitou ] youdian zhong.  
 three-cl Zhangsan de finger somewhat swollen  
 'Three fingers that are Zhangsan's are somewhat swollen.'  
 b. [<sub>NP</sub> Zhangsan de san-zhi shouzhitou ] youdian zhong.  
 Zhangsan de three-cl finger somewhat swollen  
 'Three fingers of Zhangsan's are somewhat swollen.'

More needs to be said about the contrastive implications of (12a). For the purpose of the present discussion, the point is that (12b) may be used felicitously if Zhangsan has ten fingers as people normally do, whether any of them are salient in the context or not. This should not be possible if [<sub>NP</sub> NP-*de* MP N'] had a definite reading only. Such a reading would require Zhangsan to have exactly three fingers or to have three that are salient in the context, as is the case with the English possessive in (13).

- (13) John's three fingers were injured in an accident.

In (13), *John's three fingers* is definite and may be used felicitously only if John has exactly three fingers or three of his fingers are salient in the context. Therefore, [<sub>NP</sub> NP-*de* MP N'] with a possessive NP-*de* has a reading that is not definite in (12b).

### 2.2.2. NP<sub>loc</sub>-*de* MP N'

In (14), MOD-*de* is NP<sub>loc</sub>-*de*. According to (14a), there are six pots of flowers in the yard and six in the house. Both (14b) and (14c) may follow (14a) felicitously. This shows that both [<sub>NP</sub> MP NP<sub>loc</sub>-*de* N'] and [<sub>NP</sub> NP<sub>loc</sub>-*de* MP N'] may have an indefinite reading.

- (14) a. Yuanzi li he wuzi li ge you liu-pen hua.  
 yard in and house in each have six-cl flower  
 'There are six pots of flowers in the yard and in the house respectively.'  
 b. [<sub>NP</sub> Wu-pen yuanzi li de hua ] hen haokan.  
 five-cl yard in de flower very pretty  
 'Five pots of flowers in the yard are very pretty.'  
 c. [<sub>NP</sub> Yuanzi li de wu-pen hua ] hen haokan.  
 yard in de five-cl flower very pretty  
 'Five pots of flowers in the yard are very pretty.'

If we replace (14a) with (14a'), then (14b) and (14c) may both follow (14a') felicitously with a definite reading referring back to the five pots of flowers men-

tioned in (14a'). Therefore, both definite and indefinite readings are possible for  $[_{NP} NP_{loc-de} MP N']$  and  $[_{NP} MP NP_{loc-de} N']$ .

- (14) a'. Yuanzi li he wuzi li ge you wu-pen hua.  
 yard in and house in each have five-cl flower  
 'There are five pots of flowers in the yard and in the house respectively.'
- b.  $[_{NP} Wu-pen yuanzi li de hua]$  hen haokan.  
 five-cl yard in de flower very pretty  
 'The five pots of flowers in the yard are very pretty.'
- c.  $[_{NP} Yuanzi li de wu-pen hua]$  hen haokan.  
 yard in de five-cl flower very pretty  
 'The five pots of flowers in the yard are very pretty.'

Applying the same kind of tests to NPs containing MP and various MOD-*de*'s in subject and object positions, we get the results in Table 1, which we will get to shortly.

### 3. Readings for NPs with MOD-*de* and *mei* 'every'

As already mentioned, an NP may contain a MOD-*de* and a QP headed by a quantificational word like *mei* 'every'. MOD-*de* may precede or follow QP, as in (8) repeated below.<sup>4</sup> NPs with QP preceding MOD-*de* and those with QP following MOD-*de* appear to have similar interpretations. However, a careful examination reveals that there are some meaning differences between the two orders, which I illustrate in the subsections below.

- (8) a.  $[_{NP} QP \quad \quad \quad MOD-de \quad \quad \quad N']$   
 mei-tang shangwu qu Badaling de lieche zai Shahezhen  
 every-cl morning go Badalingde train at Shahezhen  
 ting wu-fenzhong.  
 stop five-minute
- b.  $[_{NP} MOD-de \quad \quad \quad QP \quad \quad \quad N']$   
 Shangwu qu Badaling de mei-tang lieche zai Shahezhen  
 morning go Badaling de every-cl train at Shahezhen  
 ting wu-fenzhong.  
 stop five-minute

#### 3.1. Partitive and non-partitive readings

Sentences like (15a) and (15b) bring out a difference with respect to partitive and non-partitive readings of the NPs containing MOD-*de* and QP. Both (15a) and (15b) may mean Lisi sympathizes with every student wearing glasses within a particular group, i.e., the NPs may have the partitive reading 'every one of the students wearing glasses'. However, while (15a) may also mean Lisi sympathizes with any student who wears glasses, (15b) lacks such a reading.

- (15) a.  $[_{NP} QP \quad \quad \quad VP-de \quad \quad \quad N']$   
 Lisi tongqing mei-ge dai yanjing de xuesheng.  
 Lisi sympathize every-cl wear glasses de student  
 'Lisi sympathizes with any student wearing glasses.'  
 'Lisi sympathizes with every one of the students wearing glasses.'

- b. [NP VP-*de* QP N' ]  
 Lisi tongqing dai yanjing de mei-ge xuesheng.  
 Lisi sympathize wear glasses de every-cl student  
 'Lisi sympathizes with every one of the students wearing glasses.'

### 3.2. Distributive and non-distributive readings

Sentences like (16a) and (16b) show a difference in the availability of distributive readings and collective readings. In (16a), where QP precedes MOD-*de*, there is only a distributive reading, i.e., each puppy performed two numbers. But (16b) is ambiguous. While a distributive reading is possible, the sentence may also mean the puppies jointly performed two numbers.

- (16) a. [NP QP AP-*de* N' ]  
 Mei-zhi tiaopi de xiaogou biaoyanle liang-ge jiemu.  
 every-cl naughty de puppy performed two-cl number  
 'Every naughty puppy performed two numbers.'  
 b. [NP AP-*de* QP N' ]  
 Tiaopi de mei-zhi xiaogou biaoyanle liang-ge jiemu.  
 naughty de every-cl puppy performed two-cl number  
 'Every one of the naughty puppies (jointly) performed two numbers.' or  
 'Every one of the naughty puppies performed two numbers.'

## 4. Summary

The patterns of definite and indefinite readings of NPs vis-à-vis the order of MOD-*de*, MP and QP are summarized in Table 1.

Table 1. Patterns of Definite and Indefinite Readings of the NP vis-à-vis the Order of MOD-*de*, MP, and QP (every)

bare Nouns: def./indef. MOD-*de* N': def./indef.

MOD- <i>de</i>	MP MOD- <i>de</i> N'	MOD- <i>de</i> MP N'	QP MOD- <i>de</i> N'	MOD- <i>de</i> QP N'
VP- <i>de</i>	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
AP- <i>de</i>	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
PP- <i>de</i>	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
SP- <i>de</i>	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
S/NP <sub>obj</sub> - <i>de</i>	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
MP- <i>de</i>	def./indef.	def. only	-pt./pt., distr.	?? pt.
NP- <i>de</i> [-poss]	def./indef.	def. only	-pt./pt., distr.	pt., distr./coll.
NP- <i>de</i> [+poss]	def./indef.	def./indef.	-pt./pt., distr.	pt., distr./coll.
NP <sub>loc</sub> - <i>de</i>	def./indef.	def./indef.	-pt./pt., distr.	pt., distr./coll.

pt.=partitive; -pt.=non-partitive; distr.=distributive; coll.=collective;

SP=sentential predicate phrase, e.g., *yanjing hao* 'eye(s) good';

S/NP<sub>obj</sub>=clause missing an object.

Both definite and indefinite readings are possible for bare Nouns and NPs containing MOD-*de* but no MP or QP. NPs with the order MP-MOD-*de*-N' have both definite and indefinite readings, whereas those with the order MOD-*de*-MP-

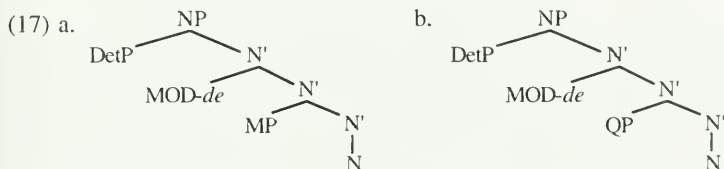


N' have only definite readings except when MOD-*de* is a possessive NP or NP<sub>loc</sub> in which case both definite and indefinite readings are possible. There are meaning differences between NPs containing QPs with quantificational words like *mei* 'every' as well. While both QP-MOD-*de*-N' and MOD-*de*-QP-N' have partitive readings, MOD-*de*-QP-N' lacks the more general reading of 'every' available for QP-MOD-*de*-N'. Also, both orders have a distributive reading, but QP-MOD-*de*-N' is only distributive, whereas MOD-*de*-QP-N' allows also a reading that is collective.

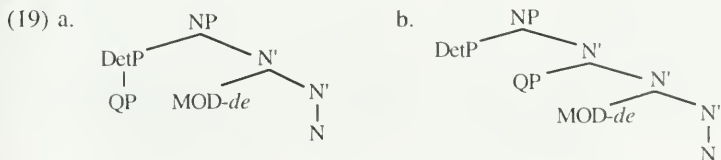
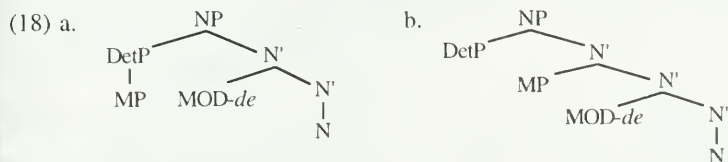
## 5. Towards an analysis of the patterns

### 5.1. Structural realizations of the different word orders in Mandarin NPs

We already showed that MOD-*de* may precede or follow MP or QP. Since MOD-*de* is plausibly regarded as an N' modifier, it is also plausible to assume that, if MOD-*de* precedes MP or QP, then MP and QP are dominated by N' and the determiner position is phonologically not realized.<sup>5</sup> This gives us the structures in (17) corresponding to the order MOD-*de* MP/QP, where MP and QP occur under N' and the determiner phrase (DetP) is phonologically null.



I assume, however, that, if MP or QP occur NP-initially, then MP and QP may occur in the DetP. Since MP and QP may occur under N', and the determiner need not be phonologically realized, it follows that the order MP/QP MOD-*de* does not univocally determine the structural position of MP and QP, since this order is also compatible with these phrases occurring under N'. Structures corresponding to the order MP/QP MOD-*de* are therefore represented as in (18) and (19). In (18a) and (19a), MP and QP are DetPs. In (18b) and (19b), they occur under N', and DetP is phonologically null.



### 5.2. The semantic import of MP in different positions

The view that from a syntactic standpoint numerals can either be determiners or be dominated by N' is not new (Partee 1988). As suggested in Partee 1987, numeral words may have a double life. For instance, *three* may be an adjective or a determiner, and the two *three*'s have different semantic types (1987:130). Partee's analysis is motivated to explain the diversity of NP interpretations on the bases of general syntactic and semantic principles (1987:115). Following Partee, I assume that numerals can be either adjectives or determiners. Accordingly, MPs can either be adjectival MPs, hereafter  $MP_{[+Adj]}$ , which combine with an N' to form an N', or be determiner MPs, hereafter  $MP_{[+D]}$ , which are determiner phrases (DetPs) that combine with an N' to form an NP. Semantically,  $MP_{[+Adj]}$  marks the cardinality of the N' it combines with. For example, the function of the adjectival MP 'three' in

[N' [ $MP_{[+Adj]}$  three] [N' men] ]

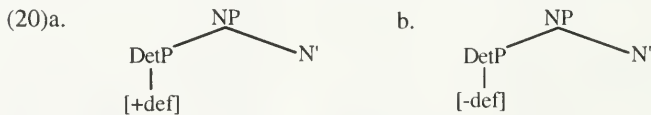
is to restrict the set denoted by [N' men] to a set whose members are groups of three. On the other hand,  $MP_{[+D]}$  denotes a relation between two sets and is in this sense quantificational. For example, the function of the determiner 'three' in

[s [NP [ $MP_{[+D]}$  three] [N' men] ] [VP left] ]

is to indicate that the intersection of the set denoted by the N' 'men' and the set denoted by the VP 'left' is not empty and has three members. The distinction between cardinal and quantificational MPs by itself does not give us the distinction between definite and indefinite readings of the NP. However, given this distinction and the assumption that when numerals occur under N', DetP is still present, though phonologically null, the definite and indefinite readings of the NP may then follow from the realizations of the DetP.

### 5.3. The realizations of the null determiner

I want to suggest that when the determiner is phonologically null, it may still be semantically active. In particular, the phonologically null det can in principle be realized as [+def] or [-def]. This means that, in the absence of grammatical factors constraining the realization of the null determiner, an NP whose determiner position is phonologically null may have the structures in (20):



I am assuming, however, that the availability of the [+def] or [-def] interpretation of the null determiner is subject to the same constraints that limit the distribution of the determiners *some* and *the*. It may be noticed that while the definite determiner *the* may co-occur with (adjectival) numerals in English, the indefinite determiner *some* cannot (I am ignoring the 'about' reading of (21b)). The same may be said of the Chinese examples in (22): (22a) is fine, but (22b) is not.

- (21) a. the three men  
b.?? some three men

- (22) a. Nei san-ge xuesheng zoule.  
 that three-cl student left  
 'Those three students left.'  
 b. \*Yixie san-ge xuesheng zoule.  
 some three-cl student left

The exact nature of the constraint responsible for the unacceptability of (21b) and (22b) deserves further investigation. For the purpose of this paper, I will simply assume the existence of a grammatical constraint which rules out structures like (23) (whether or not DetP is phonologically realized):

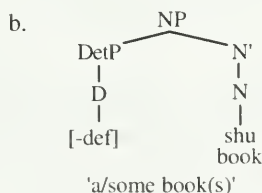
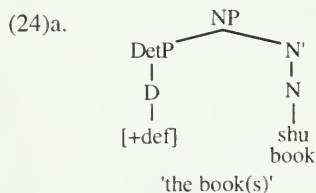
- (23) \* $[_{NP} [_{DetP} \text{-def}] [_{N'} [_{MP+Adj} \text{ num}] N']]$

(23) says cardinal adjectives may not co-occur with an indefinite determiner in an NP. Given (23), the contrasts in (21) and (22) are expected. I now turn to some predictions this analysis makes for MC NPs.

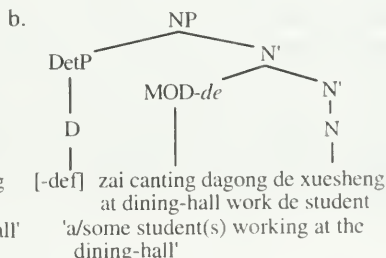
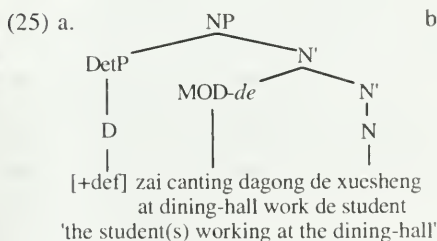
## 6. Some predictions

### 6.1. The interpretation of NPs without MPs or QPs

With the analysis proposed here, when no numeral or overt quantificational element is present in DetP, DetP can in principle be realized as [+def] 'the' or [-def] 'some', as in (24) and (25). This accounts for the indefinite and definite readings found with bare Nouns and with NPs containing MOD-*de* but no MP or QP, as in (6) and (7), respectively.



- (6) Lisi maile  $[_{NP} \text{ shu}] \text{ le}$   
 Lisi bought book part  
 'Lisi has bought a book/some books.'  
 'Lisi has bought the book(s).'



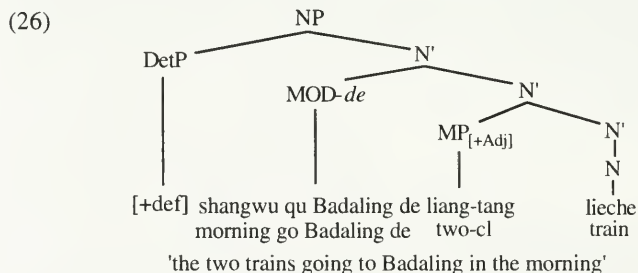
- (7) [<sub>NP</sub> Zai canting dagong de xuesheng ] gaosu Lisi nali de dangao bucuo.  
 at dining-hall work de student tell Lisi there de cake not-bad  
 'A/Some student(s) working at the dining-hall told Lisi that cake there is pretty good.'  
 'The student(s) working at the dining-hall told Lisi that cake there is pretty good.'

## 6.2. The interpretation of NPs with numerals

By the analysis proposed here, the null determiner can in principle be realized either as [+def] or as [-def], which are responsible for definite and indefinite readings of the NP. We observed however that in the case of (4), where MOD-*de* precedes the MP, only a definite reading is possible.

- (4) [<sub>NP</sub> MOD-*de* MP N' ]  
 Shangwu qu Badaling de liang-tang lieche yijing fachuqule.  
 morning go Badaling de two-cl train already dispatched  
 'The two trains going to Badaling in the morning have already been dispatched.'

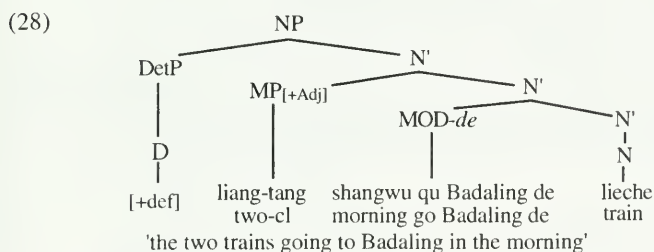
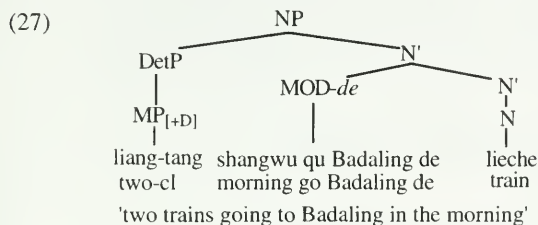
Why? Given our assumptions about the possible realizations of the null determiner, the subject NP in (4) has the structure in (26).



The [-def] reading is ruled out by the same co-occurrence restriction which is responsible for ruling out expressions like \**Some three boys left* in English. Due to the co-occurrence restriction on determiners and cardinal adjectives in the NP, when MP follows MOD-*de* and therefore is adjectival, DetP can only be realized as [+def], and the NP has a definite interpretation only. On the other hand, when MP precedes MOD-*de*, the MP may be under N' hence be adjectival, in which case DetP is [+def] again and the NP is definite. The other possibility is that the MP may be in DetP, in which case the NP is indefinite on the standard assumption that in the determiner interpretation numerals are existential quantifiers. This explains why cases like (4) with MOD-*de* preceding MP have a definite reading only and accounts for cases like (3), where MP precedes MOD-*de* and both definite and indefinite readings are possible.

- (3) [<sub>NP</sub> MP                    MOD-*de*    N' ]  
 Liang-tang    shangwu qu Badaling de    lieche yijing fachuqule.  
 two-cl        morning go Badaling de    train already dispatched  
 'Two/The two trains going to Badaling in the morning have already been  
 dispatched.'

In (3), where MP precedes MOD-*de*, the MP may be in DetP or under N', as in (27) and (28) respectively. Since the determiner 'two' is indefinite, the NP in (27) has an indefinite reading. But the NP in (28) has no overt determiner, and its DetP is [+def] due to the co-occurrence restriction on determiners and cardinal adjectives in the NP. Therefore, the NP in (28) has a definite reading. And between (27) and (28), we have the two possible readings for (3).



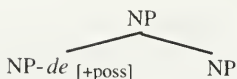
The analysis proposed here accounts for the patterns of definite and indefinite readings in Table 1 except for the cases where MP follows a possessive NP-*de* or an NP<sub>loc</sub>-*de*. In these cases, both definite and indefinite readings are possible. We turn to such cases now.

### 6.3. Possessive NP-*de* and NP<sub>loc</sub>-*de*

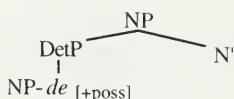
A plausible analysis for the readings found with NPs containing possessive NP-*de* and NP<sub>loc</sub>-*de* would be that possessive NP-*de* and NP<sub>loc</sub>-*de* have syntactic and semantic properties that set them apart from other types of MOD-*de*'s. But what may these properties be?

In L & T, NP-*de* is treated as an associative phrase (ASSOCP), which combines with an NP to form another NP (1981:113) or with a noun to form an NP (1981:126). In our terms this means that possessive NPs can occupy the positions in the trees in (29):

(29) a.



b.



As Huang points out, however, possessive NPs in MC can receive both definite and indefinite interpretations. For example, *wo de shu* (Lit. 'I de book') stands for 'my book(s)' as well as 'book(s) of mine', which in English are definite and indefinite respectively. Also, possessive NP-*de* may co-occur with a demonstrative pronominally, as in *wo de neiben shu* 'my that book' (= that book of mine). Huang suggests that NP-*de* is therefore not a determiner and has no definitizing function as determiners do (1987:252). If this is correct, then the structure (29b) above is ruled out for possessive NPs, and we are left with structure (29a). L & T also claim that NP-*de* only occurs NP-initially (1981:124). Sentence (30a), however, is a counterexample to this claim which incorrectly rules out the reading in (30c).

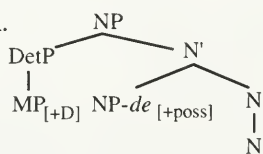
(30) a. liang-ge Beida de xuesheng  
 two-cl BU de student

b. [NP-*de* liang-ge Beida de ] xuesheng  
 two-cl BU de student  
 'students of two BU's'

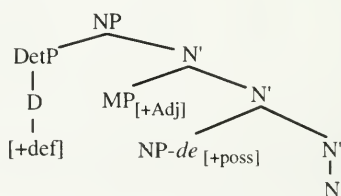
c. liang-ge [NP-*de* Beida de ] xuesheng  
 two-cl BU de student  
 'two students of BU'

Following our assumption that MPs can either be DetPs or be cardinal adjectives, we are thus led to recognize the following possible structures as licensed. MP precedes the possessive NP in (31) and follows it in (32).

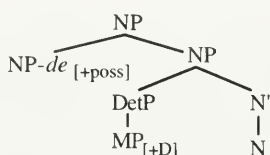
(31)a.



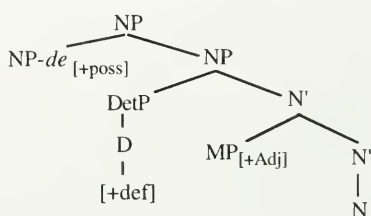
b.



(32)a.



b.



Given our analysis of the possible realizations of the null DetP, this means that while (33a) will allow the structures in (33b) and (33c), (34a) will allow both those in (34b) and (34c).

- (33) a. liang-ben Zhangsan de shu  
two-cl Zhangsan de book  
b. [NP [DetP two-cl] [N' [NP-de[+poss] Zhangsan de ] [N' book] ] ]  
c. [NP [DetP +def] [N' [MP two-cl] [N' [NP-de[+poss] Zhangsan de ]  
[N' book] ] ] ]
- (34) a. Zhangsan de liang-ben shu  
Zhangsan de two-cl book  
b. [NP [NP-de[+poss] Zhangsan de] [NP [DetP two-cl] [N' book] ] ]  
c. [NP [NP-de[+poss] Zhangsan de] [NP [DetP +def] [N' two-cl book] ] ]

This predicts correctly that both orders should allow both a definite and an indefinite reading. The analysis proposed here for possessive NP-*de* requires additional investigation, in particular independent evidence is needed for the structures I am assuming. This analysis provides, however, a plausible lead that could account for the exceptional behavior of possessive NPs. The analysis may work for NP<sub>loc</sub>-*de* as well. Assuming that these NPs can occupy the same positions as possessive NPs, then again definite and indefinite readings are predicted for both orders of NP<sub>loc</sub>-*de* and MP.

### 7. The interpretation of NPs with MOD-*de* and QP

As shown in (8), where a quantificational word *mei* 'every' is present, the different orders of the QP *mei-ge* 'every-cl' and MOD-*de* are still available.

- (8) a. [NP QP MOD-*de* N' ]  
mei-tang shangwu qu Badaling de lieche zai Shahezhen  
every-cl morning go Badalingde train at Shahezhen  
ting wu-fenzhong.  
stop five-minute  
'Every train going to Badaling in the morning stops at Shahezhen for five minutes.'
- b. [NP MOD-*de* QP N' ]  
Shangwu qu Badaling de mei-tang lieche zai Shahezhen  
morning go Badaling de every-cl train at Shahezhen  
ting wu-fenzhong.  
stop five-minute  
'Every train going to Badaling in the morning stops at Shahezhen for five minutes.'

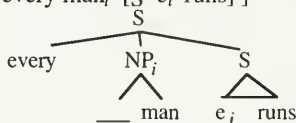
Two issues arise in the analysis of NPs containing MOD-*de* and QP here. First of all, although syntactically QP in (8b) does not have scope over MOD-*de*, semantically QP takes scope over the entire NP whether it precedes or follows MOD-*de* in the NP. Namely, (8b), like (8a), is true only on condition that every train going to Badaling in the morning stops at Shahezhen for five minutes. So what is the relation between the syntax and the semantics of NPs containing MOD-*de* and QP? Secondly, we observed that the difference in order correlates with a difference in partitive and non-partitive readings of the NPs. I will not at-

tempt a full treatment of these two issues here but will sketch some possible solutions in the sections below.<sup>6</sup>

### 7.1. Scope relations

Quantificational words like *every* are inherently relational, i.e., they always denote a relation between two sets. For example, in *every man runs*, *every* expresses a relation between the set of individuals with the property MAN and the set of individuals with the property RUN. In particular, *every* says the first set is included in the second. In comparison, numerals, as we saw, need not be relational in this sense, but may be cardinality predicates. For example, in *three men run*, *three* may simply mark the cardinality of sets of individuals that are men. In order to capture the relational nature of quantificational words like *every*, we may follow Heim (1982, 1990) and assume that in addition to Quantifier Raising (QR), there is a Quantifier Construal Rule (QC) which maps SS onto LF. QR is an operation that raises every non-pronominal NP out of S and adjoins them to S. QC is an operation that then attaches every quantifier as a leftmost immediate constituent of S (1982:132-136). For example, (35a) has the structure (35c) after QR and QC have applied.

- (35) a. every man runs  
 b. after QR: [S every man<sub>i</sub> [S e<sub>i</sub> runs] ]  
 c. after QC:



The tripartite structure in (35c) resulting from QR and QC consists of the quantifier *every*, its restrictor [<sub>NP</sub>\_\_man], and its nuclear scope [S e<sub>i</sub> runs]. Both the restrictor and the nuclear scope can be seen as denoting sets, namely as being of type <e, t>, and both are in the scope of *every*.

The analysis may be applied to NPs containing MOD-*de* and QP as well. As illustrated in (36a) and (36b), whether QP precedes or follows MOD-*de* syntactically, after QR and QC have applied, QP semantically takes scope over both the restrictor NP and the nuclear scope S and expresses a relation between two sets. It follows that since QP has scope over the NP at LF, it also has scope over MOD-*de* within the NP.

- (36)a.
- ```

    S
   /|\
  / | \
 QP NP_i S
    / \   / \
   /  \  e_i P
  /    \
 /      \
/        \
_ MOD-de N'
  
```
- b.
- ```

    S
   /|\
  / | \
 QP NP_i S
    / \   / \
   /  \  e_i P
  /    \
 /      \
/        \
MOD-de _ N'
  
```

### 7.2. Partitive and non-partitive readings

My proposal is that the partitive readings of NPs containing the quantifier *mei-ge* 'every' arise as a result of *mei-ge* co-occurring with the null [+def] deter-



miner. In other words, I am suggesting that the partitive readings for MC NPs containing the quantifier *mei-ge* correspond to LFs of form (37):

- (37) [QP *mei-ge*] [NP [+def] N'] S  
 every the

Since *mei-ge* need not occur in determiner position and can occur instead under the N', the determiner position is in principle available for the null determiner. This makes LF(37) possible. There is independent evidence from English, moreover, that, while universal and definite DetPs can co-occur to form partitive NPs, universal and indefinite DetPs cannot. The contrast in (38) makes the point:

- (38) a. Every one of the students read the book.  
 b. \*Every one of some students read the book.

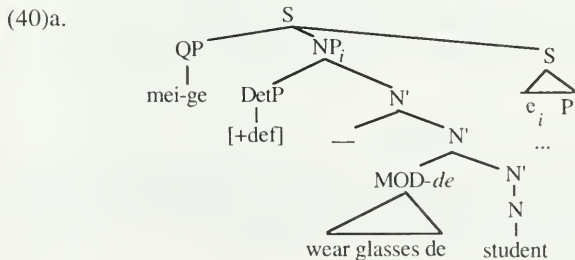
Again, the exact nature of the constraint responsible for the ill-formedness of (38b) needs to be investigated further. Notice, nonetheless, that if a similar constraint constrains the co-occurrence of *mei-ge* 'every', [+def] and [-def], we should expect that LFs of form (39), unlike LFs of form (37), should be impossible:

- (39) \*[QP *mei-ge*] [NP [-def] N'] S  
 every a

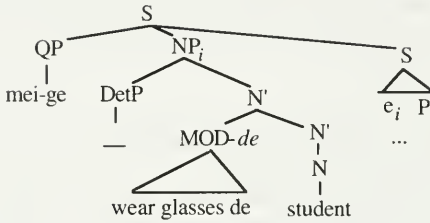
Let's now go back to the correlation between word order and partitive readings. The observation was that with the order in (15a) both partitive and non-partitive readings of the NP are possible, but with the order in (15b) only the partitive reading is possible:

- (15) a. [NP QP VP-*de* N']  
 Lisi tongqing *mei-ge* dai yanjing de xuesheng.  
 Lisi sympathize every-cl wear glasses de student  
 'Lisi sympathizes with any student wearing glasses.'  
 'Lisi sympathizes with every one of the students wearing glasses.'
- b. [NP VP-*de* QP N']  
 Lisi tongqing dai yanjing de *mei-ge* xuesheng.  
 Lisi sympathize wear glasses de every-cl student  
 'Lisi sympathizes with every one of the students wearing glasses.'

Given that co-occurrences of type (39) are barred, my analysis predicts that sentence (15a) should be ambiguous between LF (40a) and LF (40b), corresponding respectively to the case in which QP is base-generated under N' and to the case in which QP is generated in DetP position.



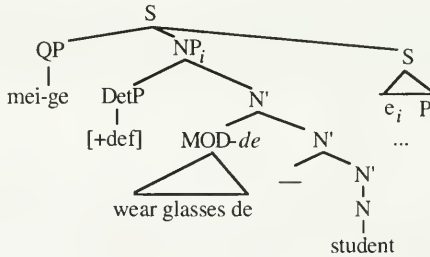
b.



(40a) in which *mei-ge* co-occurs with the definite determiner corresponds to the partitive reading for the NP in (15a), while (40b) corresponds to the standard (non-partitive) reading of universally quantified NPs assumed in Heim. Therefore, the theory predicts correctly that the NP in (15a) should have both a partitive and a non-partitive reading.

On the other hand, in (15b) the quantifier *mei-ge* is base generated under N' (since it is preceded by *MOD-de*). Thus, the determiner position will be occupied by a phonologically null determiner. Given the co-occurrence restriction in (39), however, only [+def] will be able to occur in DetP. Thus, only LF (41), which corresponds to the partitive reading of the NP, is possible for (15b).

(41)



Namely, the NP in (15b) is correctly predicted to have the partitive reading only.

## 8. Conclusion

I have shown that different interpretations of NPs containing numerals and pronominal modifier phrases correlate with the order of MP and *MOD-de* as well as with the syntactic categories in the *MOD-de*. The definiteness facts may fall out from the syntactic and semantic properties of the NP and its elements if we assume with Partee 1987 that numerals, hence MPs, may be adjectival or determinative, and from the assumption that NPs in MC may have a null determiner which, in principle, can be interpreted as definite or indefinite. The analysis also accounts for partitive and non-partitive readings of NPs containing *MOD-de* and QPs such as *mei-ge* 'every'.

## NOTES

\* I thank Profs. Alessandro Zucchi, Louise McNally, Anna Szabolcsi, and Chris Barker for comments on earlier versions of this paper, part of which was presented at the NACCL5 at the University of Delaware in May, 1993.

<sup>1</sup> Except for numerals and measure words, which I mark as a single unit with a hyphen, the pinyin orthography here is based on principles and rules by the Committees on Education and Languages (1988).

<sup>2</sup> Annear's observations also concern restrictive vs. non-restrictive readings of MOD-*de* where a demonstrative is present in the MP. These readings are also discussed in Chao 1968. The discussion in this paper concerns MPs without demonstratives.

<sup>3</sup> For the purpose of this paper it is not essential that I make a decision on whether these phrases are NPs or PPs, provided that we recognize that there is a syntactic distinction between prepositional and postpositional phrases. I shall follow, however, L & T's view that these locative phrases are NPs.

<sup>4</sup> An exception would be when MOD-*de* is MP-*de*, in which case MP-*de*-QP-N' sounds odd. Cases with demonstratives are not considered in this paper. It should be mentioned, however, that QP-NP-*de*-N' also sounds odd when a demonstrative is present in NP-*de*.

<sup>5</sup> The assumption that if MOD-*de* precedes MP or QP, then MP and QP are dominated by N' is shared by Huang (1982:67). Both numerals and quantificational words like 'every' are assigned to the syntactic category QP in Huang. I use MP and QP to reflect the different semantic properties of the two categories here.

<sup>6</sup> I will not try to address the contrast with respect to the collective/distributive distinction mentioned in section 3.2.

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