ta mai-le bi shizhi and Chinese Phrase Structure [1]

Chih-Chen Jane Tang[*]

This paper claims that cases like *ta mai-le bi shizhi* should not be treated as being transformationally derived from those like *ta mai-le shizhi bi*. An account along this line of thought not only captures the distinct syntactic and semantic behavior of noun phrases with respect to their QP predicates and their various kinds of modifiers, but also explain certain syntactic and semantic similarities and differences among various kinds of sentence-final QPs. Cross-linguistically, such an approach may also account for the contrast in the possibility of a sentence-final QP in languages like Chinese and those like English.

keywords: movement, base-generation, quantifier-floating, modifier, predicate

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0. Introduction

It is well-known that in Chinese the quantifier-classifier sequence precedes the head noun, as shown in (1):

(1)   ta mai-le shizhi bi.

he buy-PER ten-CL pen

'He bought ten pens.'

It should be noted, however, that sometimes the quantifier-classifier sequence may also follow the head noun.   Examples like (2) are of this sort, to be compared with (1):

(2)   ta mai-le bi shizhi.

he buy-PER pen ten-CL

'(lit.) He bought pens ten.'

In view of sentences like (1) and (2), an important issue is how they may be represented in terms of X'-theory.   More specifically, are (1) and (2) base-generated as two distinct sentences or are they transformationally related to each other?   For instance, it has been suggested in Ernst (1991) and Pan (1990), respectively, that cases like (2) derive from (1) by postposing of the quantifier-classifier sequence *shizhi* and head movement of the noun *bi*.   This paper, in contrast, presents arguments against such proposals and thus indicates that (1) and (2) be better treated as two transformationally unrelated sentences (see also Fu 1984 and Yang 1984).   In section 1, we sketch some previously posited analyses of the Chinese noun phrase.   Section 2 introduces three different movement approaches to the derivation of (2) from (1), and section 3 discusses some empirical and theoretical problems raised for these accounts.   In section 4, a nonmovement analysis of (2) is postulated, in which the quantifier-classifier sequence is syntactically base-generated as an adjunct argument of the verb and is semantically predicated of the object noun phrase (cf. Fukushima 1991, 1993).   It is also discussed why this approach is free from the problems given in section 3 and how the predicative quantifier-classifier sequence may be represented.   Section 5 concludes this paper by discussing some implications of our proposal.

1. Chinese Noun Phrase Structure

We have just mentioned that in Chinese the quantifier-classifier sequence precedes the head noun. Another word order fact about the Chinese noun phrase is that the possessive phrase may precede or follow the quantifier-classifier sequence. This is illustrated in (3) below:

(3) a. Zhangsan-de sanben shu

          Zhangsan-MOD three-CL book

          'Zhangsan's three books'

      b. sanben Zhangsan-de shu

          three-CL Zhangsan-MOD book

          'three of Zhangsan's books'

To account for the distributional variation exemplified in (3), Huang (1982) posits that Chinese may have the noun phrase X'-structure as in (4a-b), in which the possessive phrase in (3a-b) may be generated under the SPEC of NP and the recursive N', respectively (cf. Aoun & Li 1993b):

(4) Huang (1982)

a.

b.
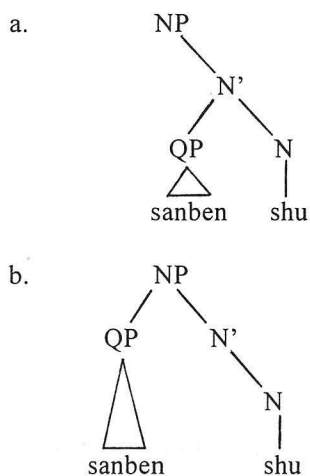
With respect to the structure of the quantifier-classifier sequence, Huang (1982) proposes that (5a-b) are both permitted in Chinese, though they differ in the head of the projection:

(5) Huang (1982)

a.

```
      QP
     /  \
   Det   Q'
        /  \
       Q    Cl
```

b.

```
      ClP
     /   \
   Det    Cl'
         /   \
        Q     Cl
```
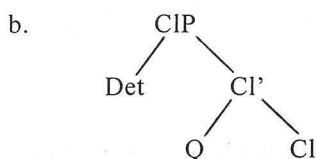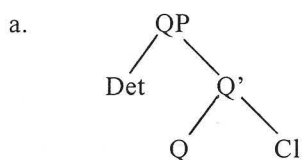
Recently, by extending Chomsky's (1986) postulation of the functional category INFL in the clause to the Det in the noun phrase, Abney (1987) posits a projection of DP as in (6) for the noun phrase, in which the lexical realization of the head D is the determiner, the genitive marker 's and demonstratives:

(6) Abney (1987)

```
   DP
     \
      D'
     /  \
    D    NP
        /  \
   QP/MP    N'
             \
              N
```
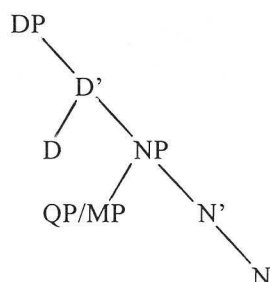
According to Abney, the possessive phrase occurs in the SPEC of DP whereas QP or M(easure)P appears in the SPEC of NP.

Similarly, in the spirit of Pollock's (1989) extended X'-theory analysis of Chomsky's (1986) IP structure, Tang (1990) extends Abney's DP hypothesis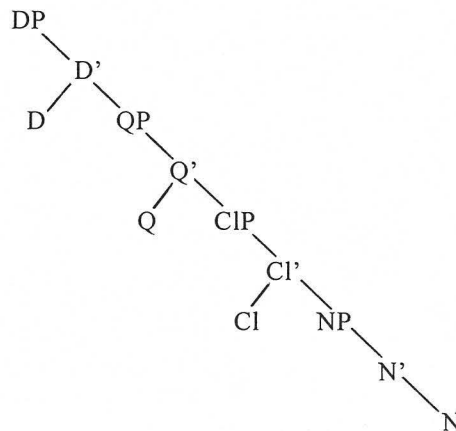 and suggests that the Chinese noun phrase may be represented by a DP structure like (7) below, in which the quantifier and the classifier both head their own projection (cf. Aoun & Li 1993b):

(7) Tang (1990)

```
DP
  \
   D'
  /  \
 D    QP
        \
         Q'
        /  \
       Q    ClP
               \
                Cl'
               /  \
              Cl   NP
                     \
                      N'
                        \
                         N
```

Under Tang's analysis, syntactic head movement applies to Cl-Q-D and Cl need not take NP as its complement (cf. Tang 1993b). Moreover, based on the word order variation in (3) and other facts, Tang claims that in Chinese the *de* marker attached to the possessive phrase does not head the DP projection and that the possessive phrase is located under the recursive XP or X' (see also Ernst 1991 and Lin 1992b).
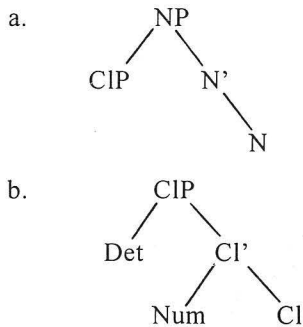
We will not examine in this paper which nominal X'-structures given above may best account for facts about the Chinese noun phrase.[2] We will only base our disussion of the structural relation between (1) and (2) on (4)-(7) when relevant.

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[2] For discussion of this issue, see, for instance, Lin (1992b) and Tang (1993b).

2. Movement Analyses

Assuming that (2) transformationally derives from (1), there have been three distinct approaches to the observed word order variation. To begin with, Ernst (1991) suggests that (2) results from (1) by postposing the quantifier-classifier sequence in (1). In Ernst (1991) the Chinese noun phrase is analyzed as in (8) (cf. Lin 1992b):[3]

(8) Ernst (1991)

a.
```
        NP
       /  \
     ClP   N'
             \
              N
```

b.
```
        ClP
       /   \
     Det    Cl'
           /   \
         Num    Cl
```

Given (8a-b) and the ClP postposing hypothesis, this means that while in (1) and (2) *shizhi* is located in the SPEC of NP, in (1) it appears to the left of N' and in (2) to the right of N'.

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[3] Under Ernst's analysis, the Chinese possessive phrase may have the structures as in (ia-b) below:

(i) a.
```
        NP
       /  \
     ClP   N'
          /  \
        Poss  N
```

b.
```
        NP
       /  \
     Poss  NP
          /  \
        ClP   N'
                \
                 N
```
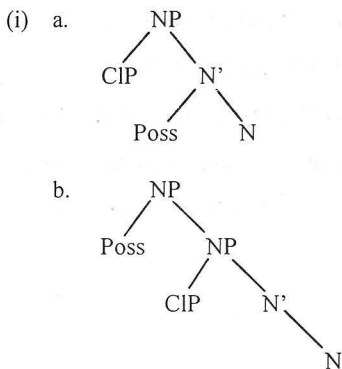
As opposed to Ernst's postulation that the moved element in (1) is the quantifier-classifier sequence, Pan (1990) argues that it is the head noun *bi* that undergoes movement.   Under his account, the Chinese noun phrase has a structure as in (9):

(9)   Pan (1990)

```
DP
  \
   D'
  / \
 D   QP
       \
        Q'
       /  \
      Q    KP (= ClP)
             \
              K'
             /  \
            K    NP
                   \
                    N'
                      \
                       N
```
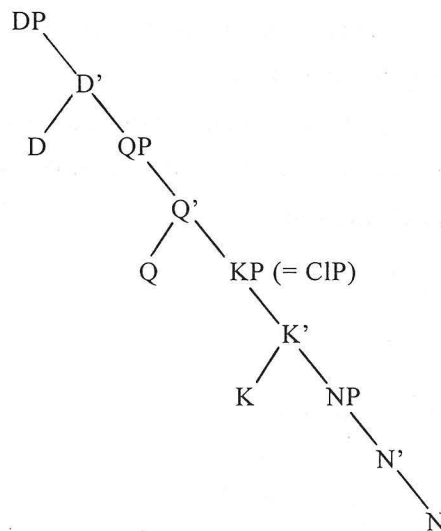
With a nominal X'-structure like (9), Pan posits that (2) derives from (1) by head movement of the N *bi* to D.

Along the lines that in (1) *bi* rather than *shizhi* is moved, an alternative to Pan's approach is that in (1) the whole NP *bi*, but not just the head N, is raised.   For an analysis of this kind, noun phrase structures like (4), (6), (8a) cannot be adopted, in that the quantifier-classifier sequence *shizhi* and the noun *bi* together constitute a maximal projection.[4]   On the other hand, structures like (7) and (9) raise no problem, because *shizhi* and *bi* are generated under two distinct maximal projections.

Another possible X'-structure for the posited movement of the noun phrase *bi* is the quantifier structure proposed in Sportiche (1988).   In his analysis of Rightward Q-movement and Leftward Q-movement, (floating) Qs may appear in NP-initial position as in (10):

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[4]   Also, in Chomsky's (1986) theory of barriers only X and XP are accessible to movement.

(10)

NP
Q   NP*
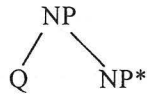
In addition, he claims that in the case of Rightward Q-movement, NP* moves to the SPEC of IP by means of NP-movement,[5] and in the case of Leftward Q-movement Q moves to a left VP-boundary in terms of QR.

Suppose that we adopt Sportiche's quantifier structure in (10) as well as Larson's (1988) VP-shell hypothesis (or Bowers' (1993) Pr(edicate)P hypothesis), cases like (1) may then have a simplified clausal structure as in (11):

(11)

IP
NP   I'
I   VP (PrP)
V' (Pr')
V (Pr)   VP
V   NP
Q   NP*
ta$_i$ t$_i$ mai$_j$-le   t$_j$ shizhi   bi
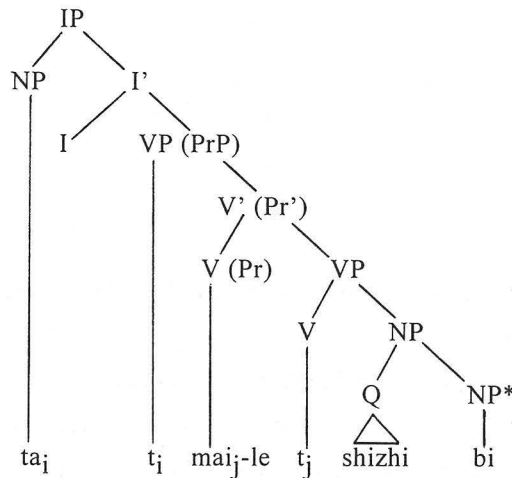
Suppose further that, though not triggered by QR, in (11) the NP* *bi* may be adjoined to the lower VP, thereby resulting in instances like (2) (cf. the discussion in note 20).[6]

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[5] According to Sportiche, a Q is in fact able to modify every available kind of empty category except intermediate traces of wh-movement.

[6] A condition on movement is given in Chomsky (1986) that arguments cannot be adjunction sites. Hence, the impossibility of the adjunction of the NP* *bi* to the object NP in (11) (cf. the discussion in section 5).

While these three movement approaches to cases like (1) and (2) all seem to be able to capture the distributional alternation between *shizhi* and *bi*, they will face certain empirical and theoretical problems in view of data other than (1) and (2). In the following section, we examine such examples in detail and suggest that a nonmovement approach may be preferred.

3. Problems for the Movement Analyses

3.1. The QP Postposing Hypothesis

In Chinese QPs may function as modifiers of different elements. They may, for example, act as prenominal modifiers in sentences like (1). They may also modify verbs expressing the meaning of duration and frequency, as (12) and (13) demonstrate:

(12) ta du-le santian shu.

  he read-PER three-day book

  'He has read books for three days.'

(13) wo qu-guo liangci neige difang.

  I go-EXP two-time that-one-CL place

  'I had been to that place twice.'

Notice that, unlike (1), postposing of QP in (12) and (13) yields the ungrammaticality of (12) and the grammaticality of (13):[7]

(14) *ta du-le shu santian.

  he read-PER book three-day

(15) wo qu-guo neige difang liangci.

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[7] For discussion of the well-formedness contrast between (12)-(13), (15) and (14), see, for instance, Tang (1990, 1991a, b, c) and Huang (1991, 1992).

I go-EXP that-one-CL place two-time

'I had been to that place twice.'

Various kinds of X'-structures have been assigned to sentences like (12) and (13).
Consider here the ones given in Tang (1991c) and Huang (1991):

(16) Tang (1991c)

```
           VP (PrP)
               \
              V' (Pr')
              /    \
         V (Pr)    VP
                   /   \
                 QP    VP
                 /\      \
                /  \     V'
               /    \    /  \
              /      \  V    NP
             |       /\ |    |
          du_i-le santian t_i shu
```

(17) Huang (1991)

```
        VP
          \
          V'
         /  \
        V   IP [+N]
            /    \
          QP     I' [+N]
          /\     /    \
         /  \  I [+N]  VP
        /    \   |      \
       |     |   |      V'
       |     |   |     /  \
       |     |   |    V    NP
       |    /\   |    |    |
    du_i-le santian t_i  t_i  shu
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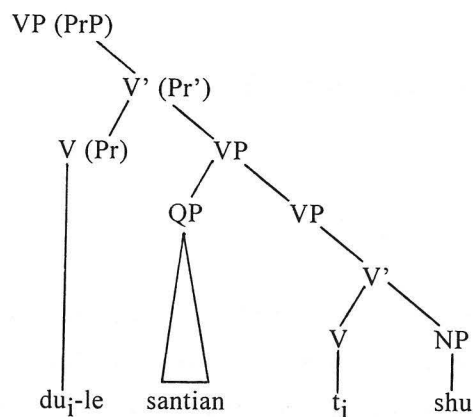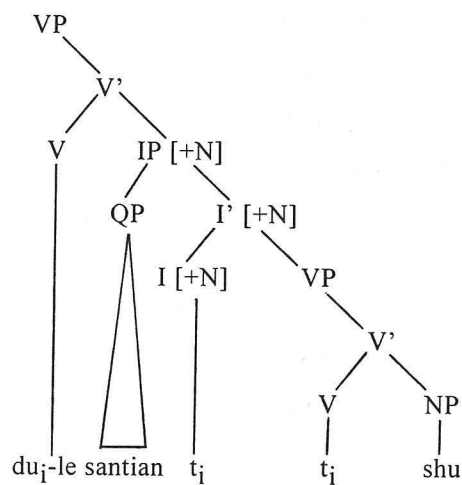
In (16) and (17), respectively, the V-modifier *santian* is located under the recursive VP and the SPEC of IP [+N]. Recall that, as shown in (4), (6) and (8a), a prenominal QP modifier may also occur under the recursive N' or the SPEC of NP. Thus, the grammaticality distinction between (2) and (14) clearly indicates that postposing of QP in Chinese is not without restrictions, ones that should be derivable from some more general principles.[8] If the condition is that only QPs modifying nouns, but not those modifying verbs and adjectives, may be postposed, a question remains as to why this should be the case.

Another set of data problematic for constraining the QP postposing hypothesis is instances like (18) below:

(18) a.   ta yibaibang zhong.

he one-hundred-pound heavy

'He weighs one hundred pounds.'

b.   ta zhong yibaibang.

he heavy one-hundred-pound

'He weighs one hundred pounds.'

Along the lines of postposing of QP in (1), (18b) may also be analyzed as deriving from (18a) via QP postposing. Shen (1991), however, argues against an approach of this sort. Among other things, she points out that while QP postposing is optional in sentences like (18a), it is obligatory in those like (19a):

(19) a.   *ta bi ni sanbang zhong.

he than you three-pound heavy

b.   ta bi ni zhong sanbang.

he than you heavy three-pound

'He is three pounds heavier than you.'

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[8] In Tang (1990, 1991a, b, c) and Huang (1991, 1992), cases like (13) and (15) are not transformationally related.

The second kind of problem has to do with prenominal modifiers other than QPs. As already illustrated in (4a-b), Huang (1982) assumes that both the possessive phrase and QP may be generated in the SPEC of NP. However, the well-formed (2) and the ill-formed (20b) suggest that only QPs may be postposed:

(20)　a.　ta mai-le ni-de shu.

　　　　　he buy-PER you-MOD book

　　　　　'He bought your book.'

　　　b.　*ta mai-le shu ni-de.

　　　　　he buy-PER book you-MOD

The same grammaticality contrast may be found in cases with APs and relative clauses:

(21)　a.　ta mai-le xin-de/[ni xie]-de shu.

　　　　　he buy-PER new-MOD you write-MOD book

　　　　　'He bought new books./He bought the book that you wrote.'

　　　b.　*ta mai-le shu xin-de/[ni xie]-de.

　　　　　he buy-PER book new-MOD you write-MOD

In view of this distinction in the possibility of postposing of prenominal modifiers, it remains a question why only QPs may be postposed.

Thirdly, as given in (8b), Ernst (1991) claims that ClP (= QP) consists of Det, Num and Cl. ClP postposing, nevertheless, exhibits definiteness effects. Examples like (22) and (23) demonstrate this observation:

(22)　a.　ta dang-le sange xuesheng.

　　　　　he flunk-PER three-CL student

　　　　　'He flunked three students.'

　　　b.　ta dang-le xuesheng sange.

　　　　　he flunk-PER student three-CL

　　　　　'(lit.) He flunked students three.'

(23)　a.　ta dang-le nasange xuesheng.

　　　　　he flunk-PER that-three-CL student

　　　　　'He flunked those three students.'

b. *ta dang-le xuesheng nasange.

he flunk-PER student that-three-CL

Again, it remains unanswered why the addition of a demonstrative in (23a) should make ClP postposing ungrammatical.

Lastly, it has been pointed out in Tang (1990) and Lin & Tang (1991) that extraposition is disallowed in Chinese, a fact that may be accounted for under Huang's (1982) X'-structure Constraint as in (24) below:[9]

(24) X'-structure Constraint

a. $[_{X}n \quad X^{n-1} \quad YP^{*}]$ (n=1 and X =/=N)

b. $[_{X}n \quad YP^{*} \quad X^{n-1}]$ (otherwise)

In essence, (24) states that while the projections of V and N, for instance, are head-final for VP, NP and the recursive VP, V', NP, N', the lowest V' is head-initial and the lowest N' is head-final. If Huang's claim is correct, then postposing of ClP in the SPEC of NP will turn the head-final NP node into a head-initial one, hence, a violation of the X'-structure Constraint.

To sum up, we have shown that, without arbitrary machinery, the QP postposing hypothesis cannot explain why not all QPs may undergo postposing; why nonQP prenominal modifiers cannot be postposed; and why QP postposing observes definiteness effects. In addition, the operation of QP postposing yields nominal structures disallowed by Huang's (1982) X'-structure Constraint.

3.2. The N-movement Hypothesis

Given that the N-movement hypothesis raises the head noun to D, cases like (12)-

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[9] The X'-structure Constraint is regarded as a PF filter in Huang (1982). See Tang (1990, 1991a) for discussion of viewing Huang's X'-structure Constraint as an S-S restriction derivable from the binary-branching condition, the theory of adjunct licensing and Larson's (1988) V-movement, Principle of Argument Realization and Thematic Hierarchy.

(15) and (18)-(19) constitute no problem for such an approach, where QPs function as modifiers (or complements) of verbs and adjectives.

With respect to the fact about (20) and (21) that the head noun cannot appear between the verb and the nonQP modifier, the N-movement hypothesis may or may not account for it.[10] For a noun phrase structure like (7) and (9), where nonQP modifiers do not occur in the head position of the projection of the noun phrase, if one follows Rizzi's (1990) Relativized Minimality and assumes that only X-zero elements are barriers for head movement, then the N-movement analysis will incorrectly predict that (20b) and (21b) are well-formed. On the other hand, if one maintains that adjunct XPs located in A'-positions may also bar the proper government of X movement, then (20b) and (21b) will be correctly ruled out as ungrammatical under the N-movement approach.[11]

Notice, however, that if a noun phrase structure like (6) is adopted, then the N-movement account cannot capture the well-formedness contrast between (2) and (20b), (21b), regardless of whether the Relativized Minimality is assumed. This is because in (6) both QP and nonQP modifiers are not generated as heads with respect to the N-to-D movement in question.[12]

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[10] According to Pan (1990), a noun phrase projects only to NP if there appears no D-Q-Cl sequence. As a result, there is no landing site for the proposed N-movement in cases like (20a) and (21a). Hence the ungrammaticality of (20b) and (21b). An account along this line is, however, problematic. For one reason, as shown in sentences like (32c), (33c) and those in note (15), nouns modified by both a QP and a nonQP still cannot undergo N-movement. For another, even though there exists no overt realization of (D)-Q-Cl in (20a) and (21a), the object noun phrases may be interpreted as referential or nonreferential, which suggests that (D)-Q-Cl may be still present with the features [+/-definite]. For further discussion of this issue, see Tang (1993b).

[11] Among others, see Cheng (1991) and Ernst (1992) for the claim that head movement in Chinese may be blocked by elements projected under adjunction position.

[12] Ernst (1992) claims that the grammaticality contrast between (ia) and (ib) should be attributed to the ECP:

As for the definiteness effects illustrated in sentences like (22b) and (23b), the N-movement analysis attributes them to the fact that the node D is already occupied and thus it is not available for N-movement. However, in Abney's (1987) theory the DP itself is the complement of a higher node, which is analyzed as the nominal counterpart of COMP. If his claim is correct, such a node can still act as a landing site for the N-movement in question.

Since head-to-head movement will not change the already determined head-initial or head-final property of a phrase structure, Huang's (1982) X'-structure Constraint will not be violated by the N-movement approach.

Before turning to the discussion of problems raised by the data in question for the NP preposing hypothesis, in the following we will present more data relevant to the examination of the N-movement analysis in cases like (1). First, compare (2), (20b), (21b), repeated below as (25a-c), with (26a-c):

(25)　a.　ta mai-le bi$_i$ shizhi e$_i$.

　　　he buy-PER pen ten-CL

　　　'(lit.) He bought pens ten.'

　　b.　*ta mai-le shu$_i$ ni-de e$_i$.

　　　he buy-PER book you-MOD

(i)　a.　ta mingtian qu-bu-qu?
　　　he tomorrow go-not-go
　　　'Will he go tomorrow?'

　　b.　*ta yongli-de da-bu-da ren?
　　　he heavy-MOD beat-not-beat man

That is, adjuncts like *mingtian* are argument-like, which are not barriers for the LF A-not-A head movement, but those like *yongli-de* are adverbials and hence block the head movement under consideration.

Given this classification of adjuncts, one may solve the problem by assuming that QP modifiers are argument-like whereas nonQP modifiers are not. As can be seen in the subsequent discussion, an account along this line cannot capture all the relevant data. See also Tang (1993a) for discussion of problems raised for Ernst's analysis.

    c.   *ta mai-le shu$_i$ xin-de/[ni xie]-de e$_i$.

        he buy-PER book new-MOD you write-MOD

(26) a.   bi$_i$, ta mai-le shizhi e$_i$.

        pen he buy-PER ten-CL

        '(lit.) Pens, he bought ten.'

    b.   shu$_i$, ta mai-le ni-de e$_i$.

        book he buy-PER you-MOD

        '(lit.) Books, he bought yours.'

    c.   shu$_i$, ta mai-le xin-de/[ni xie]-de e$_i$.

        book he buy-PER new-MOD you write-MOD

        '(lit.) Books, he bought new./(lit.) Books, he bought you wrote.'

The grammaticality difference between (25a-c) and (26a-c) suggests two important things.   One point is, as already mentioned, that an asymmetry between QP modifiers and nonQP modifiers with respect to N-movement exists in cases with the head noun moved to a postverbal position.   Another point is that such an asymmetry disappears when the head noun is raised to a preverbal position.[13]   These two observations cannot be accounted for in a principled way if (25a-c) and (26a-c) are all treated as derving from (27a-c) via movement (see also note 10):[14]

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[13] Under Pan's (1990) analysis, a potential sentence-initial landing site for the considered N-movement is COMP.

[14] In fact, this point remains intact regardless of whether the empty category in question is analyzed as trace or pro as well as whether the empty category is projected as NP, N' or N. Note, however, that the ill-formedness of cases like (i) seems to show that a movement approach to sentences like (26a-c), (28b) and (29b) may be still needed:

(i)   a.   *[wo-de gongsi]$_i$, ta zai [sange t$_i$] gongzuo.

        I-MOD company he at three-CL work

   b.   *pongyou$_i$, ta wei [liangge t$_i$] jieqian.

        friend he for two-CL borrow-money

   c.   *nuer$_i$, ta bu renshi [sheng-le yige t$_i$]-de neige ren.

        daughter he not know give-birth-to-PER one-CL-MOD that-one-CL man

(27) a. ta mai-le shizhi bi.

         he buy-PER ten-CL pen

         'He bought ten pens.'

      b. ta mai-le ni-de shu.

         he buy-PER you-MOD book

         'He bought your book.'

      c. ta mai-le xin-de/[ni xie]-de shu.

         he buy-PER new-MOD you write-MOD book

         'He bought your books./He bought the book you wrote.'

Second, the above observed distinction in the possibility of N-movement between (25a) and (25b-c), again, disappears if the whole noun phrase acts as a subject rather than object of the sentence:

(28) a. sanben shu jiu gou le.

         three-CL book then enough ASP

         'Three books will be fine.'

      b. shu$_i$, sanben e$_i$ jiu gou le.

         book three-CL then enough ASP

         '(lit.) Books, three will be fine.'

(29) a. ni-de/xin-de/[ni xie]-de shu zui gui.

         you-MOD new-MOD you write-MOD book most expensive

         'Your/New books are the most expensive./The books you wrote are the most expensive.'

      b. shu$_i$, ni-de/xin-de/[ni xie]-de e$_i$ zui gui.

         book you-MOD new-MOD you write-MOD most expensive

         '(lit.) Books, your/new/you wrote are the most expensive.'

The question, then, remains as to why this should be the case if the head noun is to be raised to a D head that is available in both the subject and object noun phrase.

Similarly, a third problem is why is it that definiteness effects disappear in cases with the head noun moved to a preverbal position and those with the whole noun phrase located in subject position:

(30) a. *wo mai-le shu$_i$ zheiben e$_i$.

   I buy-PER book this-one-CL

   b. shu$_i$, wo mai-le zheiben e$_i$.

   book I buy-PER this-one-CL

   '(lit.) Books, I bought this.'

(31) shu$_i$, zheiben e$_i$ zui hao.

   book this-one-CL most good

   '(lit.) Books, this is the best.'

Last, as demonstrated in (3), in Chinese the possessive phrase may precede or follow the quantifier-classifier sequence. These two different orderings will yield distinct outputs with respect to the operation of N-movement. Consider, for instance, sentences like (32) and (33):

(32) a. ta mai-le sanben ni-de shu.

   he buy-PER three-CL you-MOD book

   'He bought three of your books.'

   b. ta mai-le *ni-de shu* sanben.

   he buy-PER you-MOD book three-CL

   '(lit.) He bought your books three.'

   c. *ta mai-le *shu* sanben ni-de.

   he buy-PER book three-CL you-MOD

(33) a. ta mai-le ni-de sanben shu.

   he buy-PER you-MOD three-CL book

   'He bought your three books.'

   b. *ta mai-le *sanben shu* ni-de.

   he buy-PER three-CL book you-MOD

c.   *ta mai-le *shu* ni-de sanben.

he buy-PER book you-MOD three-CL

Among (32b-c) and (33b-c), only (32b) is well-formed, in which the italicized element *ni-de shu* cannot be projected as N in Pan's (1990) or Abney's (1987) noun phrase structure.   In contrast, *shu* in the ill-formed (32c) and (33c) may be viewed as N in either noun phrase structure.[15]   The fact is, nevertheless, that (32b), but not (32c) and (33c), is grammatical.[16]

As a whole, then, it should be clear by now that the N-movement analysis of sentences like (2) seems to invite more problems than solve them.

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[15] Some other relevant data are the following:

   (i)   a.   ta mai-le sanben [Zhangsan xie]-de shu.

             he buy-PER three-CL Zhangsan write-MOD book

             'He bought three of the books that Zhangsan wrote.'

        b.   ta mai-le [Zhangsan xie]-de shu sanben.

             he buy-PER Zhangsan write-MOD book three-CL

             '(lit.) He bought books that Zhangsan wrote three.'

        c.   *ta mai-le shu sanben [Zhangsan xie]-de.

             he buy-PER book three-CL Zhangsan write-MOD

   (ii) a.   a mai-le [Zhangsan xie]-de sanben shu.

             he buy-PER Zhangsan write-MOD three-CL book

             '(lit.) He bought three books that Zhangsan wrote.'

        b.   *ta mai-le shu [Zhangsan xie]-de sanben.

             he buy-PER book Zhangsan write-MOD three-CL

[16] The previously discussed three sets of data are also all problematic for Ernst's QP postposing approach about asymmetries with respect to QP, nonQPs and demonstratives. Note further that while in (32a) *sanben ni-de shu* has a partitive reading, in (33a) *ni-de sanben shu* does not (see Huang 1982). This scope contrast is, however, not found in the grammatical (32b), a fact that cannot be explained under the QP postposing hypothesis coupled with the possessive phrase structure in note (3).

3.3. The NP Preposing Hypothesis

Like the N-movement approach, cases like (18) and (19) are not problematic for the NP preposing analysis, since such sentences do not contain object NPs. The NP preposing account may also be maintained in instances like (12)-(15) if the resulting (14) is in turn subject to Huang's (1982) General Scope Principle or Aoun & Li's (1993b) Minimal Binding Requirement.[17]

Given that the considered NP preposing is an operation of raising rather than postposing, it raises no problem for Huang's X'-structure Constraint.

An account in terms of NP preposing, however, faces nontrivial problems with respect to other relevant data discussed so far. That is, the NP preposing hypothesis, like the QP postposing and N-movement approaches, cannot systematically explain the presence and absence of the contrast in the possibility of NP preposing between QP modifiers and nonQP modifiers in cases like (25)-(26) and (28)-(29). Nor can it properly explain the distinction in the presence of definiteness effects in cases like (30) and (31).

4. Towards a Solution

We have shown in the previous discussion that none of the considered movement approaches to cases like (2) can satisfactorily explain all the relevant data in Chinese. In the following, we first will suggest that (2) is base-generated rather than transformationally derived, which is then followed by a discussion of what phrase structures may be assigned to (2) and other related issues.

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[17] See Tang (1991b) for discussion of the interaction between the General Scope Principle/the Minimal Binding Requirement and the semantics of the activity reading denoted by verbs cooccurring with duration and frequency expressions.

4.1. A Nonmovement Alternative

With the previously mentioned asymmetries demonstrated in sentences like (25)-(26), (28)-(29), (30)-(31), there is very good reason to posit that there are in fact three different constructions involved throughout our discussion. Taking cases like (1), (2) and (26a) as examples, repeated below as (34a-c), we claim that (34a) contains a postverbal object noun phrase *shizhi bi*; (34b) consists of a postverbal object noun phrase *bi* and its predicate *shizhi*; and (34c) has a postverbal object noun phrase *shizhi e* in which *e* is associated with the topic *bi*:

(34) a. ta mai-le *shizhi bi*.

　　　　　he buy-PER ten-CL pen

　　　　　'He bought ten pens.'

　　　b. ta mai-le *bi* shizhi.

　　　　　he buy-PER pen ten-CL

　　　　　'(lit.) He bought pens ten.'

　　　c. bi$_i$, ta mai-le *shizhi e$_i$*.

　　　　　pen he buy-PER ten-CL

　　　　　'(lit.) Pens, he bought ten.'

In addition, as pointed out in Downing (1993), by comparison with the pre-nominal construction in (34a), the QP in the post-nominal construction (34b) appears in a more rhematic position, closer to the verb. And thus sentences like (34b), but not (34a), may be used only in cases where the information about number which it carries is new.

Now, let us see how this claim may work to explain the data examined so far as well as some new facts. To begin with, it follows naturally that an empty category located in subject/object position and bound by a sentence-initial/topic noun phrase may be modified by QPs, APs and relative clauses (as in (26a-c), (28a-b), (29a-b), (30b) and (31)). For, as (35a-d) demonstrate, the Chinese head noun may take all these elements as its modifiers:

(35) a. sanzhi bi

   three-CL pen

   'three pens'

   b. zhesanzhi bi

   this-three-CL pen

   'these three pens'

   c. xin-de bi

   new-MOD pen

   'new pens'

   d. [ni diao]-de bi

   you lose-MOD pen

   'the pen that you lost'

Second, it should be noticed that while *bi* in (34a) may be interpreted as nonreferential or nonspecific, that in (34b-c) is referential or specific.[18] Diesing (1990, 1992) argues that the nonreferential or indefinite operator Existential Closure has VP as its scope. If both (34b) and (34c) derive from (34a) by movement, it remains a wonder why the reference of *bi* in (34b) differs from that in (34a), for in either case *bi* occurs within the domain of VP.[19] On the other hand, if in (34b) *bi* is base-generated as a postverbal referential noun phrase, then the observed contrast in the interpretation of *bi* between (34a) and (34b) follows straightforwardly.[20] An

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[18] Therefore, the nonreferential expletive *ta* 'it' can occur only in (ia) below:

   (i) a. Zhangsan xiang mai ta (ge) shizhi bi.

      Zhangsan want buy it CL ten-CL pen

      'Zhangsan wants to buy ten pens.'

      b. *Zhangsan xiang mai ta (ge) bi shizhi.

      Zhangsan want but it CL pen ten-CL

[19] For discussion of no LF lowering of traces bound by the Existential Closure in Chinese, see Cheng (1991) and Tang (1991c).

[20] Given the different referential readings of *bi* in (34a) and (34b), one may argue for a transformational

derivation of (34b) from (34a) in terms of Sportiche's (1988) NP-movement for Rightward Q-movement and Mahajan's (1990) postulation of AgroP, a projection dominating VP.

In Mahajan's analysis, nonspecific noun phrases occur in a syntactic position distinct from that of specific noun phrases: the former appear in the SPEC of VP, and the latter in the SPEC of Agro (cf. Huang 1991). And the verb moves from V and Agro to a higher head position, possibly the head of T(ense)P.

Mahajan's claims about the SPEC of Agro then provide a landing site for an NP-movement approach to *bi* in cases like (34a). That is, in (34a) *shizhi bi* occurs in the SPEC of VP. After the operation of NP-movement in the sense of Sportiche (1988), (34b) is derived, with *bi* in the SPEC of AgroP. Hence, the observed difference in the referential interpretation of *bi* between (34a) and (34b).

Although an account along this line may capture the fact about the reference of *bi* in question if Chinese has Agro (cf. Huang 1982), it will still face similar problems as those raised for the NP preposing hypothesis discussed in section 3.3.

Notice also that it has been claimed in Huang (1988), Li (1990) and Lin & Tang (1991) that Chinese modals like *keneng* 'likely' are raising predicates, though they differ from one another with respect to whether Chinese has null expletives and whether modals take IP, VP or CP as their complement. If cases like (ia) below result from NP-movement, then it remains a question why while sentences like (ib-c) are well-formed, those like (25b-c) are not:

(i) a. shu keneng sanben jiu gou le.
         book likely three-CL then enough ASP
         '(lit.) Books are likely that three are enough.'

     b. shu keneng ta-de mai-de zui hao.
         book likely he-MOD sell-DE most good
         '(lit.) Books are likely that his sells the best.'

     c. fangzi yinggai xin-de bijiao zhiqian.
         house should new-MOD more-than valuable
         '(lit.) Houses should be that new are more valuable.'

Alternatively, sentences like (ia-c) may have structures like (iia-c):

(ii) a. shu, keneng sanben jiu gou le.

     b. shu, keneng ta-de mai-de zui hao.

     c. fangzi, yinggai xin-de bijiao zhiqian.

But the question about the grammaticality contrast remains unexplained. See also Cheng (1991) and Li (1992) for arguments against Sportiche-type of analysis of *dou* 'all' in Chinese as proposed in Chiu (1990) and Liu (1992).

analysis along this line may also be free from the question why only languages like English, but not those like German and Chinese, allow LF lowering of a trace bound by the Existential Closure.

Third, it is also expected that only certain elements can be predicated on an object noun phrase. Nonreferentiality, for instance, has been claimed to be one of the governing conditions on such elements, as shown in (36):

(36) a. I consider him a fool.

b. *I consider him the/that fool.

As a result, the so-called definiteness effects may be accounted for which are exhibited in the grammaticality contrast between cases like (22b), (32b) and those like (23b), (30a), (32c), (33b-c).

There are two more constructions which seem to argue against a Sportiche-type of analysis, as shown in the well-formedness contrast between (iiia), (iva) and (iiib), (ivb):

(iii) a. ?shu bei ta maidiao-le sanben.

book by he sell-PER three-CL

'(lit.) Books were sold by him three.'

b. *shu bei ta maidiao-le ni-de sanben/sanben ni-de.

book by he sell-PER you-MOD three-CL three-CL you-MOD

c. *shu bei ta maidiao-le ni-de/xin-de/[ni xie]-de/neiben.

book by he sell-PER you-MOD new-MOD you write-MOD that-one-CL

(iv) a. ?ta ba xuesheng dashang-le sige.

he BA student hit-injury-PER four-CL

'(lit.) He hurt students four.'

b. *ta ba xuesheng dashang-le [ni jiao-guo]-de sige/sige

he BA student hit-injury-PER you teach-EXP-MOD four-CL four-CL

[ni jiao-guo]-de.

you teach-EXP- MOD

c. *ta dashang-le xuesheng wo-de/qunian-de/[ni jiao-guo]-de/zheige.

he hit-injury-PER student I-MOD last-year-MOD you teach-EXP-MOD this-one-CL

A further discussion of cases like (iiia) and (iva) is given in section 5.

Another condition in Chinese is that in acting as a predicate, QPs or other kind of XPs cannot take the modifying marker *de*.[21] Hence, the ill-formedness of instances

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[21] We assume with Fu (1984) and many others that cases like (ia-b) should be treated differently from those like (2):

(i) a. wo mai-le xinyifu, hongse-de.
         I buy-PER new-clothes red-MOD
         '(lit.) I bought new clothes, red.'

     b. ta diao-le sanben shu, [ni xie]-de.
         he lose-PER three-CL book you write-MOD
         '(lit.) He lost three books, you wrote.'

For the well-formedness of sentences like (ia-b), there must appear a pause between the object noun phrase and the element following it, the latter of which has been analyzed as an appositive clause by some linguists.

In this paper we will not be concerned with the structure of such sentences, but we will point it out that, in addition to the presence of comma and pause, (ia-b) and (2) have another very distinct syntactic behavior with respect to conjunction:

(ii) a. wo mai-le bi shizhi, zhi sanzhang.
          I buy-PER pen ten-CL paper three-CL
          '(lit.) I bought pens ten and paper three pieces.'

      b. *wo mai-le xinyifu, hongse-de, xinxiezi, liuse-de.
          I buy-PER new-clothes red-MOD new-shoes green-MOD

A counterexample, however, to the claim that predicative XPs cannot take the modifying marker *de* has to do with cases with the duplication of adjectives. Consider, for instance, (iiia) and (iiib) below:

(iii) a. wo renshi yige ren hen gao (*de).
           I know one-CL man very tall MOD
           '(lit.) I know a man very tall.'

       b. *wo renshi yige ren gaogao *(de).
           I know one-CL man tall-tall MOD
           '(lit.) I know a man tall.'

In the case of (iiia), without the adjective reduplication, *de* cannot be present. In contrast, in (iiib), with the adjective reduplication, *de* must appear. This difference seems to indicate that the modifying marker *de* may cooccur with a predicate XP only if the XP cannot function as a free morpheme:

like (25b-c).[22]   There is further evidence for this claim.   As pointed out in Tang (1991b), cases like (37a) are unambiguous, whereas those like (37b) are ambiguous:

(37)   a.   ta mai-le sanbang rou.

he buy-PER three-pound meat

'He bought three pounds of meat.'

b.   ta mai-le sanbang-de rou.

he buy-PER three-pound-MOD meat

'He bought three pounds of meat./(lit.) He bought the meat each package of which is three pounds.'

However, if we put the object noun phrase *rou* in the predication construction under consideration, *de* must be deleted and the resulting sentence expresses the meaning of (37a) only:

(38)   ta mai-le rou sanbang (*de).

he buy-PER meat three-pound MOD

'(lit.) He bought the meat three pounds.'

Fourth, as one function of QP predicates is to express the quantity of the predicated object noun phrase, the object noun phrase itself cannot denote any quantity when predicated by such expressions.   Therefore, while sentences like (39) are ill-formed, those like (40) are not:

(39)   a.   *ta mai-le yiben shu yiben.

he buy-PER one-CL book one-CL

(iv)   a.   ta gao.
he tall
'He is tall.'

b.   *ta gaogao.
he tall-tall

[22] See (Tang 1990, 1991b) for the analysis of three different usages of *de* associated with a noun phrase. What concerns us here is that Tang posits a Mod(ifier)P, the head of which is the modifying marker *de*.

    b.   *wo zhaodao-le neibu chezi yibu.

          I find-PER that-one-CL car one-CL

(40) a.   ta diao-le bi shizhi.

          he lose-PER pen ten-CL

          '(lit.) He lost pens ten.'

    b.   ta mai-le yizhong bi sanzhi.

          he buy-PER one-kind pen three-CL

          '(lit.) He bought a certain kind of pen three.'

    c.   wo zhaodao-le neizhong chezi sanbu.

          I find-PER that-one-kind car three-CL

          '(lit.) I found that kind of car three.'

    d.   ta mai-le ni-de fangzi sandong.

          he sell-PER you-MOD house three-CL

          '(lit.) He sold your houses three.'

    e.   ta mai-le xin-de yifu liangjian.

          he buy-PER new-MOD clothes two-CL

          '(lit.) She bought new clothes two.'

    f.   ta you [ni xie]-de shu shiben.

          he have you write-MOD book ten-CL

          '(lit.) He has books you wrote ten.'

Fifth, when the QP predicate is not used to express the quantity of the object noun phrase, the object noun phrase itself may denote the quantity, but the modifying marker *de* still cannot be attached to the QP predicative in function.   Below is an example taken from Fu (1984):

(41) a.   wo mai-le yiben sanshiye *(de) bijibu.

              I buy-PER one-CL thirty-page MOD notebook

              'I bought a thirty-page notebook.'

      b.   wo mai-le yiben bijibu sanshiye (*de).

           I buy-PER one-CL notebook thirty-page MOD

           '(lit.) I bought a notebook thirty pages.'

Other similar exapmles are shown in (42) and (43):

(42) a.   ta mai-le yige wushiyuan *(de) jiezhi.

           he buy-PER one-CL fifty-dollar MOD ring

           'He bought a fifty-dollar ring.'

      b.   ta mai-le yige jiezhi wushiyuan (*de).

           he buy-PER one-CL ring fifty-dollar MOD

           '(lit.) He bought a ring fifty dollars.'

(43) a.   ta gai-le yidong shilou (*de) fangzi.[23]

           He build-PER one-CL ten-story MOD house

           'He built a ten-story house.'

      b.   ta gai-le yidong fangzi shilou (*de).

           he build-PER one-CL house ten-story MOD

           '(lit.) He built a house ten stories.'

---

[23] Alternatively, sentences like (41) and (43) may also be expressed as (i) and (ii) below:

(i) a.   wo mai-le yiben sanshiyehou*(de) bijibu.

        I buy-PER one-CL thirty-page-thick MOD notebook

        'I bought a thirty-page notebook.'

   b.   wo mai-le yiben bijibu sanshiyehou (*de).

        I buy-PER one-CL notebook thirty-page-thick MOD

        '(lit.) I bought a notebook thirty pages.'

(ii) a.   ta gai-le yidong shilougao *(de) fangzi.

        He build-PER one-CL ten-story-high MOD house

        'He built a ten-story house.'

   b.   ta gai-le yidong fangzi shilougao (*de).

        he build-PER one-CL house ten-story-high MOD

        '(lit.) He built a house ten stories.'

But in such cases, the predicate in question is an AP, which is in turn modified by a QP.

Summarizing, we have suggested that sentences like (2) should not be analyzed as deriving from (1) by movement. We claim that (2) in fact contains a base-generated referential object noun phrase and a base-generated nonreferential QP predicate. With the predication relationship between the object noun phrase and the predicative QP, certain semantic and syntactic constraints are imposed on both the object noun phrase and the QP predicate. Hence, the apparent asymmetries in movement between cases like (25a-c), (30a), with a predicated element, and those like (26a-c), (28b), (29b), (30b), (31), with a topic element.

4.2. QP as Adjunct Argument of a Verb and Predicate of an Object

Assuming that examples like (2) involve an object noun phrase and a QP predicate, the next issue to discuss is what the phrase structure of such sentences may be. One possible way is to adopt Larson's (1988) Principle of Argument Realization and Thematic Hierarchy as given in (44) and (45) below:

(44) The Principle of Argument Realization

If a verb α determines θ-roles $\theta 1, \theta 2, \ldots, \theta n$, then the lowest role on the Thematic Hierarchy is assigned to the lowest argument in constituent structure, the next lowest role to the next lowest argument, and so on.

(45) The Thematic Hierarchy

Agent > Theme > Goal > Obliques (manner, location, time, . . .)

Recall that the predicative QP posited above denotes the meaning of quantity. Suppose that the role of the predicative quantity belongs to one of those classified under the obliques in (45).[24] This assumption together with (44) and (45) will then

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[24] For the discussion that in Chinese the obliques in (45) contain duration, frequency, descriptive, resultative, purposive, but not manner, time, location, see Tang (1990, 1991a) and Huang (1991, 1992).

give (2) a phrase structure as in (46), with the assumptions of VP-internal Subject Hypothesis, Larson's (1988) VP-shell and V-movement:

(46)
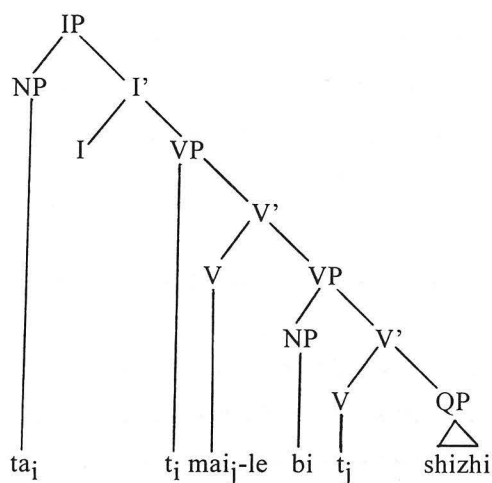
A structure like (46) means that syntactically verbs like *mai* may take a quantitive QP as its lowest argument and an object NP as its next lowest argument. And semantically the NP and QP are in a predication relationship. A similar syntactic structure is also independently proposed in Fukushima's (1991, 1993) model theoretic semantics for Japanese floating quantifiers.

Though in (2) the QP *shizhi* is analyzed as being predicated on the object NP *bi*, a representation like (47) seems to be inappropriate:

(47)
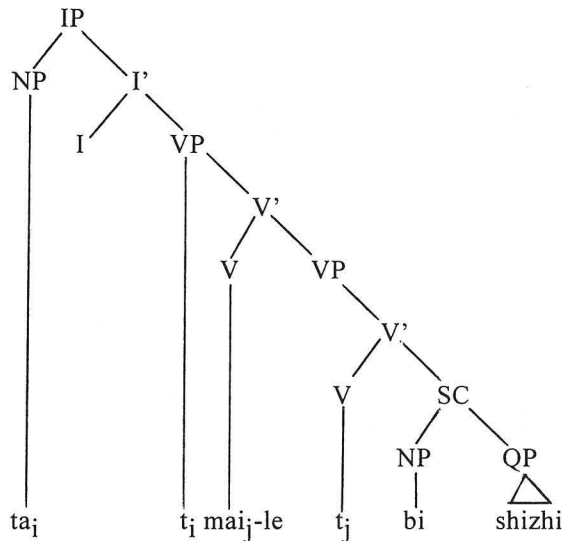
In (47) the verb *mai* is treated as being subcategorized for a small clause. This subcategorization of verbs like *mai*, however, does not conform to their c(ategory)-selection, nor to their s(emantic)-selection.[25]

The fact that object noun phrases may be predicated by a certain kind of constituent can also be found in languages other than Chinese. As an example, in English cases like (48) the object noun phrase *the meat* is predicated by the AP *raw*:

(48)   John ate the meat raw.

Various kinds of phrase structures have been postulated for sentences like (48). Bowers (1993), for instance, gives (48) a phrase structure as in (49):

---

[25] Kayne (1984), however, argues for a small-clause analysis of the double object construction.

(49)

```
                           IP
                        /    \
                     NP       I'
                      |      /   \
                      |     I      PrP
                      |     |    /    \
                      |     |   |      Pr'
                      |     |   |     /   \
                      |     |   |   Pr     VP
                      |     |   |    |    /  \
                      |     |   |    |  NP    V'
                      |     |   |    |  /\   /  \
                      |     |   |    | /  \ V    PrP
                      |     |   |    |/    \|   /   \
                      |     |   |    /      | NP    Pr'
                      |     |   |   /       | |    /   \
                      |     |   |  /        | |  Pr     AP
                      |     |   | /         | |   |      |
                    John_i  t_i ate_j  the meat_k t_j PRO_k  raw
```
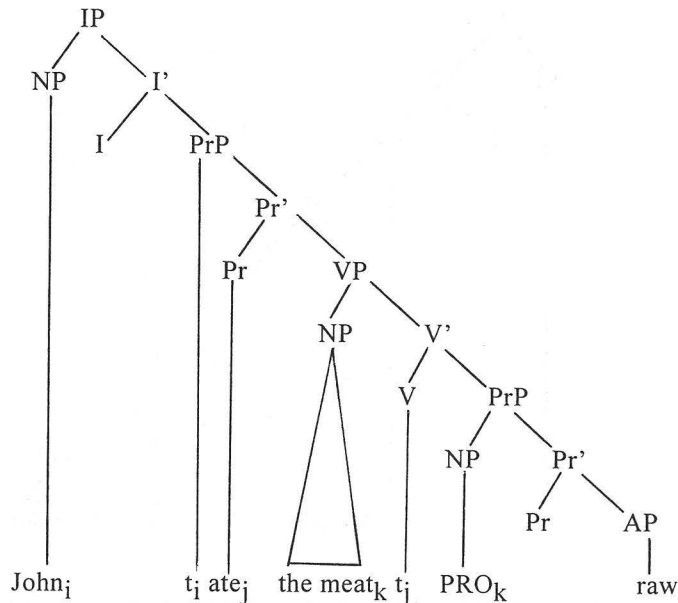
In addition to the postulation of PrP, as opposed to the VP-shell, (49) differs from (46) in that the predicative function of QP is represented by a PRO subject controlled by the object noun phrase.[26]   Note also that, unlike (47), (49) does not have the subcategorization problem pointed out above, given that the object noun phrase is not contained in the lower PrP dominating the QP predicate.   Along the line of (49), then, (2) may also have a representation like (50):[27]

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[26] Allowing a PRO subject to be generated in the SPEC of PrP raises the question of the status of the SPEC of VP with respect to government. For this issue, see the discussion in Bowers (1993). Note, however, that the existence of a governed PRO has been claimed in Mohanan (1982), Haider (1983) and E. Kiss (1987), among others.

[27] The so-called object control constructions like (i) have been traditionally classified as pivotal construction by Chinese syntacticians:

(50)
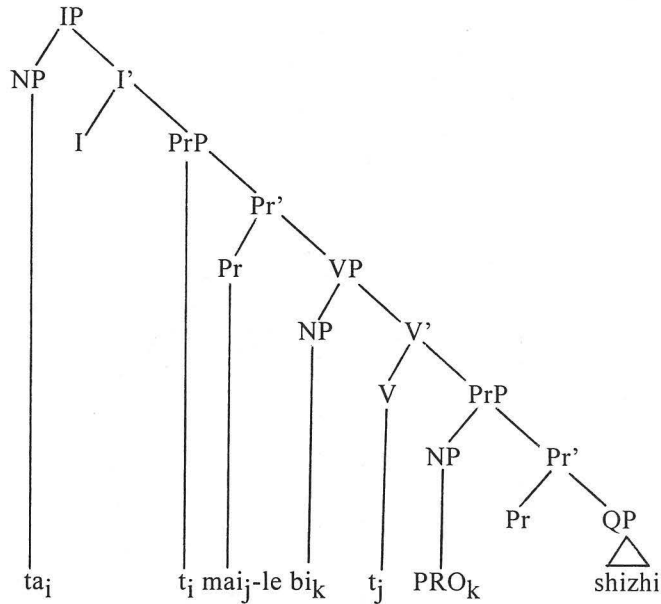
If we assume with Sportiche (1987) that every XP has a specifier position which is allowed to contain an noun phrase, (50) may be rewritten in terms of VP-shell as In (51):[28]

(i) ta bi wo [PRO lai].
     he force I come
     'He forced me to come.'

     Yang (1984) also analyzes cases like (2) as pivotal contsructions.

[28] Two things about (51) need to be mentioned here. First, it has been claimed in Williams (1980, 1983), Bowers (1993) and Heycock (1993) that syntactic predicates must be maximal projections. If this claim is correct, a predicative QP structure like (51) is problematic (see also note 29). Second, Heycock (1993) argues that the subject of a predicate must be external to the projection of the predicate unless it may form a chain with an element outside the predicate. Given that in (51) the nonexternal PRO is coindexed with the external *bi*, PRO can still act as the subject of a predication relation.

-477-

(51)

```
                    IP
                  /    \
                NP      I'
                |      /  \
                |    I'    VP
                |    |    /  \
                |    |   V    V'
                |    |   |   /  \
                |    |   |  NP   V'
                |    |   |  |   /  \
                |    |   |  |  V    QP
                |    |   |  |  |   /  \
                |    |   |  |  |  NP   Q'
                |    |   |  |  |  |    |
                |    |   |  |  |  |    Q
                |    |   |  |  |  |    |
               ta_i  t_i mai_j-le bi_k  t_j  PRO_k  shizhi
```
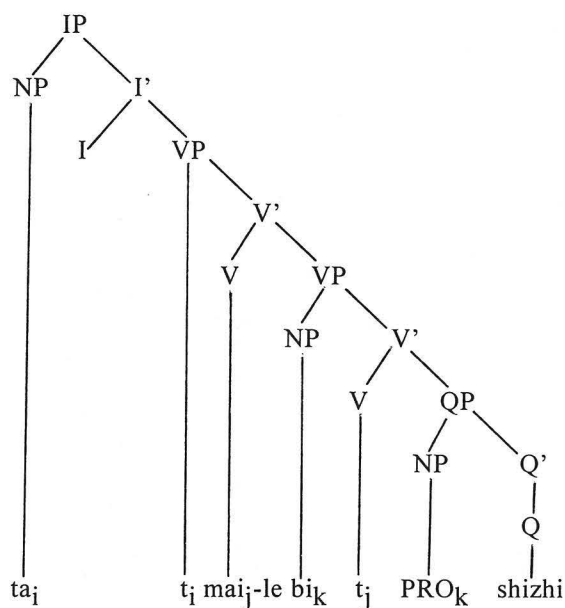
A full study of the QP predicate structures in (46), (50) and (51) is beyond the scope of this paper.[29] We will just point it out here that, unlike (47), they are all

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[29] It seems that no contrast in grammaticality exists between cases like (ia-c) and those like (iia-c), respectively:

(i)   a.   ta mai-le jizhi bi?
          he buy-PER how-many-CL pen
          'How many pens did he buy?'

       b.   ni xiuhao-le jitai chezi?
          you fix-PER how-many-CL car
          'How many cars did you fix?'

       c.   ta zhong-le jike shu?
          he plant-PER how-many-CL tree
          'How many trees did he plant?'

consistent with the binary-branching condition, the X'-structure Constraint, the Thematic Hierarchy, the Principle of Argument Realization and do not raise a problem for the subcategorization of verbs like *mai*.[30]

(ii)   a.   ?ta mai-le bi jizhi?

he buy-PER pen how-many-CL

'(lit.) How many pens did he buy?'

b.   (?)ni yigong xiuhao-le chezi jitai?

you altogether fix-PER car how-many-CL

'(lit.) Altogether, how many cars did he fix?'

c.   (?)ta daodi zhong-le shu jike?

he on-earth plant-PER tree how-many-CL

'(lit.) How many trees on earth did he plant?'

The above grammatical sentences seem to suggest that both the predicative QP and the modifying QP can be wh-questioned. The same observation is however not found between cases like (iii) and those like (iv):

(iii)   a.   What does John consider Bill?

b.   How sick does John consider Bill?

(iv)   a.   *How angry did you meet Bill?

b.   *How raw did he eat the meat?

If the above observation is correct and the grammaticality distinction is not solely due to pragmatics, then ill-formed sentences like (iv) may shed light on the postulation of the QP structures in (46), (50) and (51). That is, the phrase structure of (iia-c) should reflect the fact that the QP predicate can be wh-moved at LF (cf. Aoun & Li 1993a). In other words, the QP predicate is an XP and its trace(s) can be antecedent-governed in the sense of Chomsky (1986) or Cinque (1990) (cf. Rizzi 1990). For the latter requirement, the idea may be that while the projection of unselected predicates of objects may be generated as arguments of verbs, it still constitutes a barrier for government. Both requirements, however, seem to suggest that clause structures like (46) may be preferred.

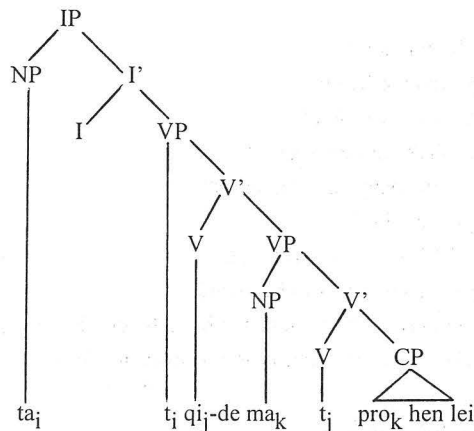[30] It has been pointed out in Cheng (1989) that controllers of PRO cannot be preposed:

(i)   a.   ta bi neige ren [PRO xue yingwen].

he force that-one-CL man learn English

'He forced that man to learn English.'

b.   *[neige ren]$_i$, ta bi t$_i$ [PRO xue yingwen].

that-one-CL man he force learn English

Also, in Huang (1989) cases like (iia) are analyzed as (iib) below:

(ii)   a.   ta qi [de ma hen lei].

           he ride DE horse very tired

           'He rode to the extent that the horse got very tired.'

      b.

```
                    IP
                   /  \
                 NP    I'
                 |    /  \
                 |   I    VP
                 |        |  \
                 |        |   V'
                 |        |  /  \
                 |        | V    VP
                 |        | |   /  \
                 |        | |  NP   V'
                 |        | |  |   /  \
                 |        | |  |  V    CP
                 |        | |  |  |    /\
                ta_i     t_i qi_j-de ma_k  t_j  pro_k hen lei
```

What concerns our discussion here is that it has been observed that (iiib) is unambiguous, though both (iiia) and (iia) are well-formed:

(iii)   a.   ta$_i$ qi [de pro$_i$ hen lei].

           he ride DE very tired

           'He got very tired from riding.'

      b.   [neipi ma]$_i$, ta$_j$ qi [de e$_{*i/j}$ hen lei].

           that-one-CL horse he ride DE very tired

           'As for that horse, he got very tired from riding it.'

In other words, (iiib) cannot be analyzed as deriving from (iia-b).

    If the above discussion is on the right track, the well-formedness of cases like (26a), repeated below as (iva), does not constitute a counterexample to (50) and (51), in that, as we have argued, (iva) has a D-structure as in (ivb):

(iv)   a.   bi, ta mai-le shizhi.

           pen he buy-PER ten-CL

           '(lit.) Pens, he bought ten.'

      b.   ta mai-le shizhi bi.

           he buy-PER ten-CL pen

           'He bought ten pens.'

It should be noted here that the postulation of the predicative QP as the innermost argument of verbs captures the fact that in Chinese the QP predicate must appear in sentence-final position.   Examples like (52)-(54) illustrate this observation:

(52) a. ta gen liangge qinqi jie qian.

   he with two-CL relatives borrow money

   'He borrowed money from two relatives.'

   b. *ta gen qinqi liangge jie qian.

   he with relatives two-CL borrow money

(53) a. ta wei sange xuesheng nanguo.

   he for three-CL student sad

   'He felt sad for three students.'

   b. *ta wei xuesheng sange nanguo.

   he for student three-CL sad

(54) a. ta fang-le yige xiangzi zai menqian.

   he put-PER one-CL box in door-front

   'He put a box in front of the door.'

   b. *ta fang-le xiangzi yige zai menqian.

   he put-PER box one-CL in door-front

Note also that certain syntactic and semantic conditions have been claimed on the predication construction.   Williams (1980), for example, states that a predicate within the VP must take as its antecedent the theme role (cf. Culicover & Wilkins 1986), thereby accounting for the well-formedness of (55a) and the ill-formedness of (55b):

(55) a. He built the house small.

   b. *He loves the house small.

In his study of the predicative QP in Japanese, Miyagawa (1986) also points out that noun phrases predicated by the QP are subject to the Theme Condition, as shown in the grammaticality contrast between (56b) and (57b):

(56) a. kinoo, ni-satsu-no hon-o katta.[31]

yesterday two-CL-GEN book-ACC bought

'I bought two books yesterday.'

b. kinoo, hon-o ni-satsu katta.

yesterday book-ACC two-CL bought

'I bought two books yesterday.'

(57) a. boku-wa san-nin-no sensei-ni hon-o moratta.

I-TOP three-CL-GEN teacher-DAT book-ACC received

'I received books from three teachers.'

b. *boku-wa sensei-ni san-nin hon-o morrata.

I-TOP teacher-DAT three-CL book-ACC received

Although Miyagawa differs from us in that he adopts a movement approach to cases like (56b) and (57b) (cf. Fukushima 1991, 1993), the Theme Condition seems to also hold for Chinese sentences with QP predicates:

(58) a. *ta hen laoshi sange.[32]

he hate teacher three-CL

b. *wo xihuan hua yiduo.

I like flower one-CL

The grammaticality contrast between cases like (57b), (58a-b) and those like (56a), (57a), (1), on the one hand, as well as those like (56b), (2), on the other hand, may be ascribed to the s-selection of the oblique quantity QP by a verb.

Another fact pointed out by Miyagawa is that noun phrases embedded within PPs cannot be predicated by QPs:

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[31] Tomoyuki Yoshida (personal communication) pointed out that in both (56a) and (56b) *ni-satsu* can be wh-questioned.

[32] Bare NP objects of verbs like *hen* 'hate' and *xihuan* 'like' must be interpreted as generic. Thus, the ill-formedness of examples like (58a-b) may also be attributed to the condition that the object noun phrase predicated by QP must be referential.

(59) *gakuseitati-wa kuruma-de ni-dai kita.

       students-TOP cars-in two-CL came

Although it seems to us that cases like (59) can also be ruled out by the Theme Condition, the same observation is true for Chinese:

(60) a. *ta zhu zai dafangzi-li yidong.

          he live at big-house-inside one-CL

      b. *wo ji-le shu gei pengyou liangge.

          I send-PER book to friend two-CL

Miyagawa attributes the ungrammaticality of (59) to a violation of Culicover & Wilkins' (1986) Bijacency Condition. That is, the predicative QP fails to be a sister to the predicated noun phrase or to be immediately dominated by a sister of the predicated noun phrase. With QP predicate structures like (50) and (51) (cf. note 29), another possible explanation is that noun phrases embedded within PP or VP cannot properly control the reference of the PRO subject in (50) and (51).

In view of clause structures like (50) and (51), however, a question remains as to why the empty category under consideration is PRO, but not NP-trace. Recently, Diesing (1990, 1992) argues that stage-level predicates are raising predicates, whereas individual-predicates are control predicates. Sentences (61) and (62), for instances, are thus analyzed as involving the raising and control construction, respectively:[33]

(61) Firemen$_i$ are [$_{VP}$ t$_i$ available].

(62) Linguists$_i$ are [$_{VP}$ PRO$_i$ intelligent].

Based on the above structures, Diesing also claims that only subjectes raised from VP may have an existential interpretation.

Assuming with Diesing's approach, the question then is whether the oblique quantity QP acts more like a stage-level or individual-level predicate. According to

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[33] Cf. Bowers' (1992) approach, in which the opposite structures are assigned to stage-level and individual-level predicates.

Carlson (1977), stage-level predicates denote transient properties of individuals, while individual-level predicates express permanent properties of them. Therefore, verbs such as *know*, *love*, etc. and adjectives such as *intelligent*, *tall*, etc. are individual-level predicates, but verbs like *speak*, *run*, etc. and adjectives such as *drunk*, *available*, etc. are stage-level predicates. We have already pointed out in the previous discussion that the object predicated by the QP must be referential or specific. It seems rather difficult to claim that predicative QPs like *yiben* 'one-CL' and *sanzhi* 'three-CL' express permanent properties of *shu* 'book' and *bi* 'pen', respectively, in the relevant sense. Unless, one wants to say that the fact that in Chinese classifiers semantically agree with nouns should be taken as an indication of the permanent property in question. With respect to this permanent/nonpermanent contrast, predicate QPs seem to behave more like stage-level predicates.[34]

As stated in Bowers (1992), several other tests may be applied to see whether a predicate is a satege-level or individual-level one. In the following, some of them will be examined. First, stage-level, but not individual-level, predicates occur felicitously in the small clause complements of perception verbs:

(63) a. I saw Mary asleep.

b. I heard Mary put the cat out.

(64) a. *I saw Mary tall.

b. * I heard Mary like John.

As shown in (65), cases with predicate QPs seem to parallel to (64):

(65) a. *wo kandao-le xuesheng sange.

I see-PER student three-CL

b. *ta tingtao-le huaixiaoxi yige.

he hear-PER bad-news one-CL

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[34] Bowers (1992) states that all predicate nominals are individual-level predicates. If our discussion so far is plausible, it seems that in Chinese not all predicate nominals are individual-level predicates.

Recall, however, that objects predicated by the predicative QP is subject to the Theme Condition. That is, they need to be interpreted as the affected noun phrases. Hence, the ungrammaticality of sentences like (65a-b) does not argue against the postulation of predicate QPs as stage-level predicates.

Second, stage-level, but not individual-level, predicates can occur in the progressive:

(66)   a.   Mary is learning Latin.

       b.   *Mary is knowing Latin.

To be compared with (66), consider (67) below:

(67)   a.   ta mai-le shu sanben.

            he buy-PER book three-CL

            '(lit.) He bought books three.'

       b.   *ta zai mai shu sanben.

            he is buy book three-CL

Again, the ill-formedness of (67b), as opposed to the well-formedness of (66a) and (67a), seems to indicate that the predicate QP cannot be a stage-level predicate. Note, nevertheless, that the object bare noun phrase of a verb in progressive form needs to be interpreted as nonreferential, in that the verb has an activity reading (see also Huang 1992). Since the object predicated by the predicative QP must be referential, it follows that predicative QPs cannot appear in constructions like (67b).

Third, existential *there-be* and *have* sentences permit only stage-level predicates in object position:

(68)   a.   There are/We have two women drunk.[35]

---

[35] However, it seems that Chinese existential sentences are not subject to this condition, as shown in (i) below:

(i)   a.   wo you yige pongyou hen congming.

           I have one-CL friend very intelligent

           '(lit.) I have a friend very intelligent.'

    b.   *There are/We have two women intelligent.

As (69a-b) illustrate, the predicate QP may be located in existential sentences:

  (69)   a.   wo you ni-de shu sanben.

                I have you-MOD book three-CL

                '(lit.) I have your books three.'

       b.   zuoshang you [Meiguo lai]-de xin liangfeng.

                table-top have America come-MOD letter two-CL

                '(lit.) On the table are letters from the States two.'

Fourth, individual-level predicates, unlike stage-level predicates, do not normally allow either temopral or locative adverbials:

  (70)   a.   Mary was asleep yesterday.

       b.   ??Mary was intelligent yesterday.

  (71)   a.   Mary speaks Latin at home.

       b.   ??Mary knows Latin at home.

As for the predicate QP, it seems that sentences containing it may also have the temporal or locative adverbial:

  (72)   a.   wo zuotian mai-le bi shizhi.

                I yesterday buy-PER pen ten-CL

                '(lit.) Yesterday I bought pens ten.'

       b.   ?ta zai zheli gai-le fangzi shidong.

                he at here build-PER house ten-CL

                '(lit.) Over here he built houses ten.'

If our discussion given above is on the right track, then it seems that semantically oblique quantity QPs may be analyzed as stage-level predicates, but not individual-

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    b.   women-de banshang you yige xuesheng hezui-le.
           we-MOD class-top have one-CL student drink-PER
           'Our class has a student drunk.'

level predicates. As for the issue of whether the empty category bound by the object noun phrase in (50) and (51) should be an NP-trace or PRO (cf. note 29), we will leave it for future research, for the answer to it requires a detailed study of the syntactic and semantic behavior of NP-trace and PRO.[36] However, two points are worth mentioning here. First, if in (50) and (51) the empty category in question is an NP-trace, it will be a trace left by a subject-to-object raising. A relevant issue then is whether the Theta-criterion is obeyed in this kind of movement. According to Heycock's (1993) study of the predication structure in Japanese, she claims that predication is independent of theta-role assignment. In other words, the subject of a predicate may be nontheta-marked.[37] If her claim is right, then in (50) and (51) movement of the subject of the QP predicate to the object of the verb may not violate the Theta-criterion. Also, it has been argued in Postal & Pollum (1987) and Bowers (1993), among others, that object positions, like subject positions, can be theta-bar-positions. Lin (1993) also maintains that the Chinese expletive *ta* 'it' in sentences like (73) occurs in the SPEC of VP:

> (73)   a.   wo kan-le ta sangexiaoshi dianshi.
>
>   I watch-PER it three-CL-hour TV
>
>   'I watched TV for three hours.'
>
>   b.   ta xiang chi ta sanwan fan.
>
>   he want eat it three-CL rice
>
>   'He wants to eat three bowls of rice.'

Second, if Diesing's (1990, 1992) claim is correct that the trace of a bare NP generated in the scope of VP and not bound by an element outside VP must be

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[36] Along the lines of Tsai's (1994) mapping of nuclear scope, the projection(s) of the predicative QP in (46), (50) and (51) may be posited to contain a predicated empty subject that is bound by an operator that is in turn bound by the lexical object. We leave this for future research.

[37] She claims that the subject-predicate relation can be established via an aboutness relation.

interpreted as nonspecific (see also note 19),[38] then the referential condition on the object noun phrase predicated by QP suggests that the empty category in (50) and (51) should not be an NP-trace. Note also that with the Theme Condition on the predicative QP construction, it seems that a PRO analysis may be preferred. Because the predicative QP is not obligatory, but the predicated object noun phrase must be selected:
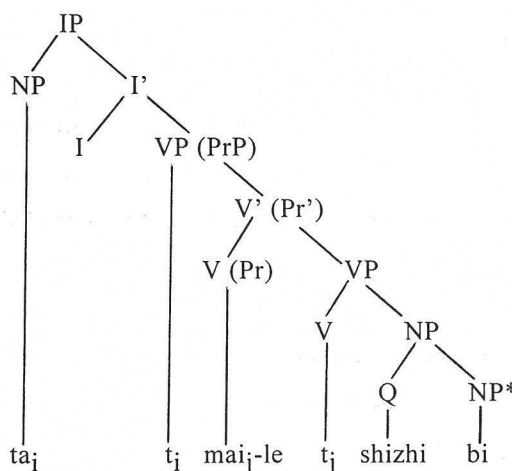
(74)   a.   ta mai-le *(e).

           he buy-PER

           'He bought something.'

       b.   ta mai-le bi (shizhi).

           he buy-PER pen ten-CL

           '(lit.) He bought pens (ten).'

5. Implications and Conclusion

We have shown in this paper that *mai* 'buy' and *shizhi* 'ten-CL' in cases like (2) may be better analyzed as of a "verb and adjunct argument" relation, thereby accounting for certain asymmetries with respect to the word order variation between the head noun and various kinds of prenominal modifiers. If our approach is on the right track, something more needs to be said about possible adjunction sites of the object noun phrase *bi* in an X'-structure like (11), repeated below as (75):

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[38] In Chinese a bare noun phrase can be interpreted as plural or singular.

(75)

```
                        IP
                      /   \
                    NP     I'
                    |     /  \
                    |    I'   VP (PrP)
                    |   / \      \
                    |  I   VP    V' (Pr')
                    |  |    |      /   \
                    |  |    |   V (Pr)  VP
                    |  |    |     |    /  \
                    |  |    |     |   V    NP
                    |  |    |     |   |   /  \
                    |  |    |     |   |  Q    NP*
                    |  |    |     |   |  |     |
                   ta_i  t_i mai_j-le  t_j shizhi  bi
```

In (75) nothing discussed so far can prevent the NP* *bi* from being adjoined to the lower VP node. If adjunction of this sort should be permitted in Chinese and nominal structures like (6), (7), (9) and (ib) in note (3) are plausible, then object noun phrases modified by elements other than QPs may be thus moved, too, a prediction that has been demonstrated not to hold in Chinese.

To rule out this adjunction option in (75), there seem to be two ways. One possibility is to assume with Muller & Sternefeld (1993) that adjunction sites may be parametrized across languages.[39] Chinese, for instance, does not allow syntactic VP-adjunction, though it permits PrP-adjunction.[40] Another approach is to assume with

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[39] According to Muller & Sternefeld's theory of improper movement, adjunction to arguments should also be allowed (cf. Chomsky 1986). Tang (1990) and Lin (1992a), for instance, suggest that argument CPs are possible adjunction sites in Chinese.

[40] A question, now, is whether VP is a barrier for antecedent-government. If we assume with Cinque's (1990) theory of barriers, then VP is not a barrier in the first place. Another way is to say that while (intermediate) adjunction to VP may be permitted for certain types of movement, adjunction to VP cannot be the final landing site of the data in question, a fact that may be

Huang (1992) that the lower VP node of a VP projection does not count as a maximal projection (cf. Aoun & Li 1993b).[41] Given that adjunction sites for movement are limited to maximal projections (cf. Aoun & Li 1993b), it follows that *bi* cannot be adjoined to the lower VP.

A second issue to be addressed here is the relation between object noun phrases and different kinds of sentence-final QPs. We have pointed out in (iia-c) of note (29), repeated below as (76a-c), that the oblique quantity QP of the verb can be wh-questioned:

(76) a. ?ta mai-le bi jizhi?

   he buy-PER pen how-many-CL

   '(lit.) How many pens did he buy?'

   b. (?)ni yigong xiuhao-le chezi jitai?

   you altogether fix-PER car how-many-CL

   '(lit.) Altogether, how many cars did you fix?'

   c. (?)ta daodi zhong-le shu jike?

   he on-earth plant-PER tree how-many-CL

   '(lit.) How many trees on earth did he plant?'

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resorted to the system of feature specification proposed in Chomsky (1992). Similar postulations may be said about the SPEC and adjunction positions of nominal structures like (6), (7) and (9) as well as the TP-AgroP-VP projection discussed in note (20).

[41] Huang (1992) indicates that in a structure like (46), the lower VP is not a maximal projection and hence cannot undergo movement:

(i) *lian [bi shizhi]$_i$, ta dou   mai-le t$_i$.

    even pen ten-CL he all buy-PER

If this postulation is plausible, a question remains as to why in (10) NP* can be moved. An alternative account of the fact about the unmovable lower VP in (46) is to assume the conjunctive ECP and Rizzi's (1990) claim that antecedent-government by X cannot be reconstructed. Hence, in cases with the lower VP moved the trace left by the verb cannot satisfy the ECP. For further discussion of the issue about the interaction of the nonmaximal projection and movement with respect to the data examined in this paper, see Tang (1993b).

And we have also suggested that the well-formedness of (76a-c) may be attributed to a satisfaction of the ECP, which seems to indicate that a clausal structure like (46) may better represent the predication relation involved.

Similar to sentences like (76a-c), sentence-final QPs in those like (77a-c) can also be wh-questioned:

(77)   a.   ta qu-guo nali jici?

              he go-EXP there how-many-time

              'How many times has he been there?'

        b.   ta deng-le ni duojiu?

              he wait-PER you how-long

              'How long did he wait for you?'

        c.   ni ti-le ta jijiao?

              you kick-PER he how-many-foot

              '(lit.) How many kicks did you kick him?'

Each instance of QP in (77a-c) expresses the meaning of frequency, duration and measure, respectively.   Such expressions, like quantity QP obliques, are not selected by verbs:

(78)   a.   ta qu-guo nali (yici).

              he go-EXP there one-time

              'He has been there (once).'

        b.   ta deng-le ni (sangexiaoshi).

              he wait-PER you three-CL-hour

              'He waited for you (for three hours).'

        c.   ni ti-le ta (yijiao).

              you kick-PER he one-foot

              'You kicked him (one kick).'

They, however, differ from quantity QP obliques in that while syntactically they have been assumed to be modifiers or complements of verbs, they are not semantically interpreted as predicates of object noun phrases (cf. Tsai 1994).

Given these similarities and differences between sentence-final quantity QPs and sentence-final duration, fequency, measure QPs, it seems that regardless of whether the latter QPs are projected in adjunct position or complement position, there appears no PRO within their projection, which is bound by the object noun phrase. Hence the possibility of locating them in wh-questions.

Another aspect concerning the relation between the object noun phrase and the sentence-final QP is the interpretation of such an object in the form of a bare noun phrase. Consider, for instance, the following examples:

(79) a. *ta du-le shu sangexiaoshi.

          he read-PER book three-CL-hour

     b. *wo da-le qiu liangci.

          I play-PER ball two-time

     c. neige ren ti-le yizi yijiao.

          that-one-CL man kick-PER chair one-foot

          'That man kicked the chair one kick.'

     d. ta mai-le bi shizhi.

          he buy-PER pen ten-CL

          '(lit.) He bought pens ten.'

Cases like (79a-d) illustrate two important things. One thing is that bare object noun phrases are interpreted as nonreferential in (79a-b) and referential in (79c-d). Another fact is that (79a-b) are ungrammatical, whereas (79c-d) are grammatical. As opposed to (79a-d), sentences like (80) are well-formed, in which the reading of the bare object noun phrase can be nonreferential or referential:

(80) ta du-le shu le.

      he read-PER book ASP

      'He read./He read the book.'

In view of the well-formedness contrast between (79a-b) and (80), a question arises as to why in (79a-b), but not (79c-d), the bare object noun phrases must receive

a nonreferential interpretation. It seems to us that this has to do with the types of sentence-final QPs following them. Verbs taking bare object noun phrases and duration or frequency QPs must have an activity reading, but those taking bare object noun phrases and measure or quantity QPs cannot have such a reading. As a result, only in (79a-b) are the bare object noun phrases obligatorily interpreted as nonreferential (see also note 7).

A third issue is how to account for the fact that Chinese sentences like (2) are not permitted in every language. For example, the English counterparts of (2) and (iiia) of note (20) are all ill-formed, as shown in (81a-b) below:

(81)   a.   *He bought (the) pens ten.

        b.   *(The) Books were sold by him three.

The ungrammaticality of (81a-b) indicates that in English numeral expressions cannot appear sentence-finally. Similarly, Sportiche (1988) and Bowers (1993), respectively, also point out that cases like (82), with NP-movement, and (83), without NP movement, are ill-formed:

(82)   a.   *The children were seen all.

        b.   *The children have arrived all.

(83)   a.   *The children have seen this movie all.

        b.   *I saw the men all.

While Sportiche and Bowers both treat quantifiers like *all* as triggers for Sportiche-type of NP-movement, they differ from each other with respect to the account of the ill-formedness of (82a-b). In Sportiche's analysis, (82a-b) are out because English passives, as opposed to French ones, do not involve NP-movement, hence the lack of an empty category after *all* and the impossibility of quantifier floating. Bowers, on the other hand, argues that *all* may also be projected as adjunct, which cannot be generated in sentence-final position. One of his arguments is that in French the sentence-final *tous* 'all' may also be found in cases without NP-movement:

(84) a. Les enfants ont ete vus ?tous/presque tous.

the children have been seen all/almost all

b. Les enfants sont venus ?tous/presque tous.

the children came all/almost all

c. Les enfants ont dormi ?tous/presque tous.

the children have slept all/almost all

Given that the Chinese sentence-final oblique quantity QP may occur in both actives and passives as well as such a QP is analyzed as an adjunct argument in our approach, we propose that English instances like (81a-b) are ruled out by the same condition as that on the sentence-final *all*.

In contrast to our account, Kuo-ming Song (personal communication) suggests that cases like (81b) violate the Case Theory, hence the ungrammaticality of the sentence.   That is, assuming with Belletti (1988) that unaccusative verbs may assign partitive case, the subject in (81b) is assigned both nominative and partitive cases.   In Chinese, on the other hand, the partitive case may be left with the stranded QP with a classifier that is nominal in nature.   As a result, Chinese does not observe the violation of no case conflict constraint.   An approach along this line of thought seems to be problematic for the following reasons.   First, if Sportiche (1988) is right in claimimg that English passives do not involve NP-movement, then the issue of case conflict does not exist.

Second, according to Belletti assignment of partitive case is not obligatory.   If it is indeed obligatory, it is not clear why cases like (85) are grammatical, to be compared to (81b):[42]

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[42] Guo-ming Song (personal communication) points out that French sentences like (ia-d) also fall under the condition of no case conflict:

(i) a. Il a ete tue trois hommes.

'There have been three men killed.'

b. Trois hommes ont ete tues.

(85)   Three books were sold.

Third, it is not true that numerals in English cannot receive case, as illustrated in (86a-b):

(86)   a.   Two of them came yesterday.

       b.   I saw two of your students this morning.

Fourth, as shown in the Japanese (56a-b), repeated below as (87a-b), the object NP is case-marked with *o*, regardless of whether or not the QP with a classifier is stranded:

(87)   a.   kinoo, ni-satsu-no hon-o katta.[43]

            yesterday two-CL-GEN book-ACC bought

            'I bought two books yesterday.'

       b.   kinoo, hon-o ni-satsu katta.

            yesterday book-ACC two-CL bought

            'I bought two books yesterday.'

Fifth, recently it has been argued that in Chinese the subject of a passive is base-generated in situ and that the trace after the passive morphology is a variable or pro

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       'Three men have been killed.'

   c.   *(Des) hommes ont ete tues trois.
        '(lit.) (The) Men have been killed three.'

   d.   Il en a ete tue trois.
        '(lit.) It of them has been killed three.'

That is, as opposed to (ic), only in cases like (id), where a pronoun clitic *en* is present, can the partitive case be not carried along with the moved NP.

Note, however, that even in actives *en* must appear:

(ii)   J' *(en) ai mangees trois.
        '(lit.) I of them have eaten three.'

Therefore, it seems that the relevant condition is not just that of no case conflict.   We leave such data for future study.

[43] Note that, as pointed out in Koizumi (1993), in Korean the stranded QP may be optionally overtly case-marked, but the case-marked and non-case-marked QPs exhibit distinct syntactic behavior.

rather than NP-trace (see, for instance, Tsai 1993, Chiu 1993 and Cheng et al. in preparation). If such an analysis is correct, then the issue of case conflict is not relevant for the grammaticality of sentences like (iiia) of note (20).

Lastly, the object in the *BA*-construction has been claimed in Huang (1989) and Tsai (1993) to be case-marked by *ba* or the verb; thus, V-movement does not take place in the case of *ba* as a case assigner. Under this approach, well-formed cases like (ivb) of (20), repeated as (88), not only do not involve the question of case conflict, but also argue for a base-generation analysis of the floating quantifier in Chinese, for extraposition and lowering are not allowed in Chinese:

(88)   ?ta ba xuesheng dashang-le sige.

          he BA student hit-injury-PER four-CL

          '(lit.) He hurt students four. '

In conclusion, we have claimed in the previous discussion that cases like (2) should not be treated as being transformationally derived from those like (1).[44] An account along this line of thought not only captures the distinct syntactic and semantic behavior of noun phrases with respect to their QP predicates and their various kinds of modifiers, but also explain certain syntactic and semantic similarities and differences among various kinds of sentence-final QPs. Cross-linguistically, such an approach may also account for the contrast in the possibility of a sentence-final QP in languages like Chinese and those like English.

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[44] Although we have suggested that cases like (2) are not derived from (1) by syntactic movement of quantifiers or the relevant NPs, we do not mean that quantifiers in (2) cannot undergo QR at LF, an issue that is left for future study. Similarly, Cheng (1990) argues that while the syntactic distribution of the adverb *dou* 'all' with respect to its quantified NPs is not transformationally related, *dou* still needs to move at LF.

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他買了筆十枝與漢語詞組結構

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　　本文認爲*他買了筆10枝*這類的句子不是從*他買了10枝筆*移位變形得來的。這樣的分析不僅可以說明漢語名詞組的數量述詞與名前修飾語的句法、語意上的異同，也可以解釋出現於句尾的不同數量詞組的相關異同。另外，漢語與英語在句尾數量述詞的句法差異也得到了解釋。