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SOME ASPECTS OF CHINESE SYNTAX:

A Government-Binding Approach

BY

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## ABSTRACT

Research on the Chinese language from the perspective of Government-Binding Theory requires the satisfactory execution of the GB modules in Chinese syntax. This thesis investigates a number of aspects of Mandarin Chinese syntax from this point of view.

Chapter 1 outlines the GB framework and raises the issue of constituency in Chinese.

Chapter 2 discusses a number of GB theorems with reference to Chinese. They include X-bar syntax and head ordering, the governing function of INFL, distribution of PRO and pro,  $\theta$ - and Case-marking, Case-adjacency, the notion of accessible SUBJECT, empty-topic binding, the ECP and its rival approach, generalised binding.

Chapter 3 examines the structural process of BA-insertion (object-marking) and BEI-insertion (passive-marking). It is argued that Move  $\alpha$  should apply to [<sub>NP</sub> ...NP...] where NP = [NP, VP/PP] and VP = a quantificational phrase (QP), but restructuring to [NP, PP] which is at the same time a member of a higher argument structure.

Chapter 4 investigates wh-quantifier constructions. A new COMP-marking system, [ $\pm$ WH,  $\pm$ QUAN], is introduced to license syntactic wh-quantifier movement, whose trace needs to be locally bound if the moved wh-quantifier is an adjunct, but need not be locally bound if the moved wh-quantifier is a non-adjunct.

Chapter 5 considers descriptive clause constructions. It is argued that there is an empty operator movement in descriptive clauses which display undounded dependency, and that descriptive clauses are not within the NPs they modify, as they differ from relative clauses in distribution and in escaping the CNPC.

Chapter 6 analyses serial verb constructions. The long-standing issue of whether a V-V series is of coordinate or subordinate structure is re-examined. A subject-control analysis is proposed for these constructions, as they are more likely to be of a subordinate structure. Evidence for empty operator movement in some purposive constructions is also studied.

Chapter 7 deals with the so-called pivotal constructions. It shows that determining the constituent structure of these constructions is the key to treating them as object-control, as there is no distinction between finite verbs and infinitives in Chinese.

Chapter 8 attempts to treat subordinative clause constructions. It is shown that raising is not possible in these constructions containing the item BA, whose occurrence (in these constructions) is to Case-mark the object of the matrix verb, which becomes defective after suffixed with the particle 'De'. Other alternatives to BA-insertion are verb-reduplication, NP-movement (of the object of the matrix verb into the subject position of the subordinative clause), or the attachment of an additional verb to the matrix verb (hence the so-called "resultative verb-complement"). Evidence for not treating 'De' as a complementiser is independently produced.

Chapter 9 summarises the findings of this thesis.

To My Grandparents

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## SCRIPTS AND ABBREVIATIONS

BA, BEI, etc.	prepositions
Zhe, Le, Guo, Zai	aspect markers
'kan shu' (to read a book)	Chinese texts with English translation in brackets
ob.m	object marker
p.m	passive marker
m.p	measure particle
asp	aspect marker
c.p	clausal particle
p.	particle
3sg	third person singular
res.p	resumptive pronoun
N, V, A, P, ADV	noun, verb, adjective, preposition, adverb
NP/VP/AP/PP/ADVP	noun/verb/adjective/prepositional/adverb phrase
COMP/Comp	complementiser
SPEC	specifier
QUAN	quantifier
INFL	inflection
TOP	topic
AGR	agreement
TNS	tense
ASP	aspect
[NP, S/NP]	subject of a clause/noun phrase
[VP, S]	predicate of a clause
[NP, VP/PP]	object of a verb/preposition
[NP(+a/p)]	an anaphor/pronominal

[PRO/pro, S]	a PRO/pro in subject position
t	trace
[t, S/VP]	a trace in subject/object position
np	an empty NP position
*	The following sentence is ungrammatical.
* ( )	The following sentence is ungrammatical if the text between parentheses is missing.
(* )	The following sentence is ungrammatical if the text between parentheses is present.
?/??	The following sentence is of doubtful grammaticality.
!	The following sentence is semantically ill-formed.
ECP	The Empty Category Principle
EPP	The Extended Projection Principle
NIC	The Nominative Island Condition
SSC	The Specified Subject Condition
IDC	The Immediate Dominance Condition
LBC	The Left Branch Condition
CNPC	The Complex NP Constraint
CSC	The Coordinate Structure Constraint
DWC	The Double Wh-movement Constraint

## Chapter 1 Introduction

In this study, I investigate a number of aspects of Mandarin Chinese (Putonghua) syntax within the framework of government-binding theory (GB) (Chomsky, 1981, 1982, 1986a). Of the aspects investigated, some have been largely neglected in the past, and others have been given less comprehensive treatment than that attempted in this thesis. The aim of the present study is to introduce further insights into the application of GB methodology to Chinese syntax.

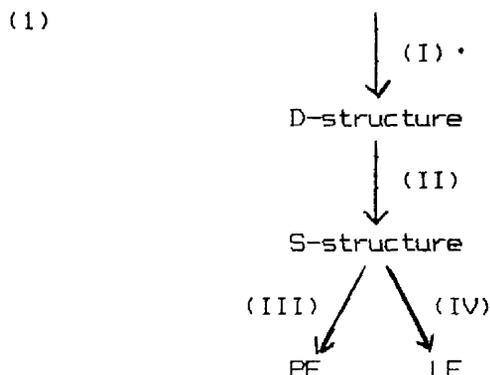
### 1.1 An Outline of the GB Framework

When giving a review of GB, Williams (1984a:401) writes, "I believe that a GB methodology exists, whose identity rests not on the details that distinguish different versions of the theory, but on the search for a modular theory of grammar". To this, Aoun (1986:XVI) adds that the GB methodology is also characterised by its parametrised approach to the theory of grammar.

Perhaps the notion of GB being more of a methodology than a conceivable model of universal grammar (UG) is appreciated more now than at the time when GB was first formulated. We can see this from the work of authors exploring the scope of the explanatory options of GB with data from languages other than English (e.g. Rizzi, 1982; Huang, 1982a-b; Borer, 1984a; Hong, 1985; Saito, 1985; Kayne, 1984; Koopman, 1984; Hermon, 1985; Aoun, 1986). The core characterisation of the GB methodology - syntactic modularity and parametrisation - has been the essence of a GB approach to the nature of relevant data. We shall also observe this in the present study.

The GB framework that I shall outline below is formulated in Chomsky (1981) and further expounded in Chomsky (1982) and (1986a). To bring my references to GB up to date, I shall always refer to the latest edition of Chomsky (1981), which appeared in 1986 and is henceforth referred to as Chomsky (1986b). On no account does the following brief outline represent an adequate or complete theorisation of the GB framework, nor shall I attempt any justification for it. The outline is relevant only to the discussions and analyses which follow in later chapters of this study, and the reader is directed to the references, which are given where necessary, for a full version of the relevant theory.

The overall rule system of GB grammar is sketched as follows (Chomsky, 1986a:67-68):



In (1), the Roman numerals in parentheses represent the stages at which rules are applied: lexical and categorial rules apply in (I); the transformational rule (Move  $\alpha$ ,  $\alpha$  = any category) in (II), (III) and (IV); phonological rules in (III); logical form formation rules in (IV). Lexical rules specify the abstract morpho-phonological structure of each lexical item and its syntactic features, including its categorial and subcategorisational features. Categorial rules, together with lexical rules, generate D-structure. D-structure is mapped to S-structure by the

rule Move  $\alpha$ , which, as stated above, also applies in formation of phonetic forms (PF) and logical forms (LF). Phonological rules convert S-structure to phonetic representations and LF formation rules convert S-structure to logical representations.

(1) thus comprises the following subcomponents (Chomsky, 1986b:5):

- (2) a. Lexicon (lexical items and lexical rules)
- b. Syntax (categorical rules and the rule Move  $\alpha$ )
- c. PF component
- d. LF component

Interacting with the subcomponents of the rule system, there are subsystems of principles (Chomsky, 1986b:5):

- (3) a. Bounding theory
- b. Government theory
- c.  $\theta$ -theory
- d. Binding theory
- e. Case theory
- f. Control theory

Together, the subcomponents of the rule system and the subsystems of principles constitute the modules of GB grammar (Chomsky, 1986a: 160ff). In the present study, lexicon, PF and LF do not concern me. I shall restrict my discussion to the contents of other modules and the interactions of these modules in the component of Syntax (2b) only.

#### Categorical rules or X-bar theory

X-bar theory was first proposed in Chomsky (1970:210) and further developed in Emonds (1976, chap. 1) and notably in Jackendoff (1977). One version of X-bar theory is as follows (Chomsky, 1986b:48):

- (4)  $X' \rightarrow \dots X \dots$  ( $X = [\pm N, +V]$  or  $[\pm V, +N]$ )

where X is a lexical category represented by the features  $[\pm N]$  and  $[\pm V]$ ,

which have the combination [+N, -V] for noun, [-N, +V] for verb, [+N, +V] for adjective and [-N, -V] for preposition (Chomsky, *ibid.*). The notion that (4) should concern feature representations is to systemise the categorial relations (Chomsky, 1972; Muysken and van Riemsdijk, 1986).

The fundamental notion conveyed in (4) is that  $X'$  is a projection of  $X$ , as schematised in (5) (Jackendoff, 1977:34, 36):

$$(5) \quad X^n \rightarrow \dots X^{n-1} \dots$$

However, what is to be defined as the maximal projection of  $X$  depends on language-specific conditions. By convention, the maximal projection of  $X$  as far as lexical categories are concerned is written as  $XP$ , as in  $NP$ ,  $VP$ ,  $AP$  and  $PP$ , and the maximal projection of clauses is written as  $S$ , to which I shall return in 2.1. Given an  $XP$ ,  $X$  is its head and  $XP$  the domain of  $X$ .

The most important factor in  $X$ -bar theory is the head-initial/final parameter, which specifies that complement(s) should always occur in the same position with respect to the head (Koopman, 1984; Travis, 1984; Chomsky, 1986a). The relative order of complement(s) is determined by  $\theta$ - and Case-marking (see below) (Chomsky, 1986b; Stowell, 1981; Koopman, 1984; Travis, 1984; Sells, 1985; Muysken and van Riemsdijk, 1986).

In GB, all syntactic categories are assumed to conform to  $X$ -bar theory. However, as far as individual languages are concerned, empirical evidence for this assumption must be sought. In 2.1, I shall examine relevant evidence for  $X$ -bar syntax in Chinese.

Government theory

The concept of 'government' plays a key role throughout GB grammar, though its definition may vary for different languages (a reflection of the parametric characteristic of the GB methodology). For the present study, it is sufficient to have the version in Chomsky (1986a:162), following Belletti and Rizzi (1981), Aoun and Sportiche (1983), and Kayne (1984):

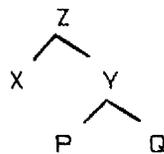
(6) X governs Y if X and Y c-command each other.

where X = a category; Y = a maximal projection; c-command = constituent-command (Reinhart, 1979; Langacker, 1969), defined as in (7) (Chomsky, 1986a:162):

(7) X c-commands Y if the least maximal projection containing X contains Y and if Y is not contained within X.

One consequence of (6) and (7) is, as illustrated in (8), that a maximal projection forms a barrier to government (Chomsky, 1986b:300; Horrocks, 1987:137):

(8)



In (8), if Z and Y are maximal projections, X and Y c-command each other and X also c-commands P and Q. However, the government of X cannot go beyond Y to P or Q, because neither P nor Q c-commands X. On the other hand, if Y is not taken as a maximal projection, P and Q will c-command X, which then governs the former. To solve this barrier problem in order to allow more cases, Belletti and Rizzi (1981) assume that if P or Q is

the head of Y, it can be considered to be governed by X by virtue of the fact that Y is governed by X.

However, position is not the only factor determining government. Among the overt categories, only lexical categories and their projections qualify to be governors. Two abstract elements, AGR(reement) in the category INFL(lection) and co-indexed traces, are also assumed to be governors (I shall explain trace in  $\theta$ -theory, co-indexing in binding theory, and AGR and INFL as we proceed). To motivate AGR to be a governor is to allow the subject of a tensed clause to be governed, since the verb of a tensed clause, in English for instance, inflects in agreement with the subject in person and number. The requirement for subject government derives from Case theory, which obliges the subject of a tensed clause to have Case under government (see Case theory later).

The motivation for co-indexed traces being governors derives from the subject-object asymmetry regarding the extraction of a wh-expression exemplified in:

- (9)a. \*who<sub>i</sub> do you think [ t<sub>i</sub> that [ t<sub>i</sub> will win Wimbledon]]?
- b. who<sub>i</sub> do you think [ t<sub>i</sub> [ t<sub>i</sub> will win Wimbledon]]?
- c. who<sub>i</sub> do you think [that [John will meet t<sub>i</sub> ] ]?
- d. who<sub>i</sub> do you think [that [John will agree with t<sub>i</sub> ] ]?

The ungrammaticality in (9a), known as the *that-t* effect (Perlmutter, 1971; Bresnan, 1972; Chomsky and Lasnik, 1977), is said to be due to lack of proper government, as the presence of *that*, in contrast to (9b), prevents the trace next to it from c-commanding, thus governing, the trace in subject position (see 4.4.1.1 for the mechanism of the *that-t* effect). Given this account, a parameter called the Empty Category Principle (ECP) is established, requiring a trace to be

governed either by a co-indexed trace or by a lexical item (Chomsky, 1986b:250ff, 300ff), such as in (9b-d), where the trace is governed, respectively, by a co-indexed trace, a verb and a preposition.

The core case for the ECP is trace government (9a-b), not lexical government (9c-d). Thus, in a language which does not show the *that-t* effect, the ECP is irrelevant. As Lasnik and Uriagereka (1988) point out, trace government and lexical government pose a disjunction in theory, because they have different effects on their governees. For example, Horrocks (1987:141) notes that the widely assumed successive cyclicity of *wh*-movement (e.g. 9b) is dismissible in such cases as (9c-d), where the movement is out of object position and the trace is lexically governed, so that there is no need to assume a cyclicity of movement. In other cases where movement is out of subject position, such as (9b), the movement should be successively cyclic for the sake of trace government, unless one assumes that the verb in the matrix clause can govern the trace in subject position of the embedded clause. But this assumption cannot be taken without a systematic examination of the consequences involved <1>. This example clearly shows that the effect of trace-government and that of lexical government differ from one another.

In Chinese, which manifests no tense or subject-predicate agreement, government of subject position has to be motivated independently of the way in which it is done in English. Besides, Chinese does not have the *that-t* effect. Thus the ECP seems irrelevant in this language. I shall return to these issues in 2.2.

## $\theta$ -Theory

$\theta$ -theory assumes two crucial conditions on the behaviour of lexical items in GB grammar. One is the Projection Principle in (10) (Chomsky, 1986b:29), and the other the  $\theta$ -Criterion.

- (10) Representations at each syntactic level (i.e., LF, D- and S-structure) are projected from the lexicon, in that they observe the subcategorisation properties of lexical items.

The subcategorisation properties in (10) are of two kinds: syntactic as well as thematic relations between a head (= lexical item) and its complements. Syntactically, a head and its complements are projected into a phrasal structure specified by X-bar theory and maintain their positions in this structure at all levels. This means that even when a category moves to somewhere else, e.g. the *wh*-item in (9) moves from subject/object position to clause initial position, its original position continues to exist at all levels. One classical argument supporting this proposition is that a moved category leaves a trace occupying the original position, based on the type of data (from black American English) in (cf. O'Neil, 1981:78-79; Radford, 1981:178; Chomsky, 1986b:19):

- (11)a. I don't wanna come. vs. I don't want him to come.  
b.  $who_i$  don't you want  $t_i$  to come?  
c. \*Who don't you wanna come?

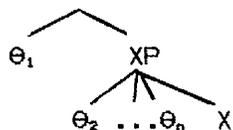
The fact that (11c) is barred (*want to* cannot be contracted into *wanna*) suggests that there is a gap (interpreted as the trace left behind by the moved *who*) after the verb *want* (11b) (see, amongst others, Chomsky (1977) and Chomsky and Lasnik (1977) for arguments for traces). A trace is written as 't', as we have seen in (9) and (11).

Thematically, complements bear certain thematic relations to the

head, such as 'patient', 'goal', etc. (see Gruber, 1965; Fillmore, 1968; Jackendoff, 1972). These thematic relations are referred to as  $\theta$ -roles. A head assigns a  $\theta$ -role to each of its complement(s) and each complement bears only one  $\theta$ -role. This is the essence of the  $\theta$ -Criterion (cf. Freidin, 1978; Chomsky, 1986b:36-38).

The subject of a clause, according to Chomsky (1986b:36), gets a  $\theta$ -role, such as 'agent', from its predicate, a verb for instance. A verb assigns a  $\theta$ -role to the subject 'externally', and 'internally' to its complement(s) (Chomsky, 1986a:116). In technical terms, an element receiving a  $\theta$ -role is an argument (Chomsky, 1986a:93), and the argument structure of a lexical head is illustrated as follows (adapted from Williams, 1981, 1982):

(12)



where the argument outside XP is external and those within it internal. In English, though verbs are assumed to be associated with (12) (Williams, 1982; Higginbotham, 1983), NPs with a subject and a complement can also have a similar argument structure to (12), for example *John's destruction of the city* (Chomsky, 1986a:192, 194).

Given (12), the fact that the subject of a clause is an argument but that the Projection Principle does not say anything about this, leads, by stipulation, to the so-called Extended Projection Principle (EPP), requiring that a clause must have a subject, even if the subject is a non-argument, such as the pleonastic elements like *it* and *there* in English (Chomsky, 1986b:116).

Positions occupied by an argument are therefore argument-positions, shortened as A-positions. Those which are not occupied by an argument

are non-argument positions, shortened as  $\bar{A}$ -positions.

It is assumed that (internal)  $\theta$ -assignment follows the head-initial/final parameter of X-bar theory, i.e. that it occurs in the same direction as complements do with respect to the head (Koopman, 1984: 121). As the head governs its complement(s),  $\theta$ -assignment is under government (Chomsky, 1986a).

### Case theory

Case in GB is an abstract notion (see Chomsky, 1982, 1986a-b). Case theory requires that objects of prepositions and transitive verbs and subjects of tensed clauses should have Case (Chomsky, 1982:6). As such objects and subjects are usually identified as NPs, a Case Filter is formulated to capture this requirement (Chomsky, 1986a:74, following Rouveret and Vergnaud (1980)):

(13) Every phonetically realised NP must be assigned (abstract) Case.

(13) thus accounts for the ungrammaticality in (14) if the elements in parentheses are missing (cf. Chomsky, 1986a:186):

(14)a. \*(For) John to be the winner is unlikely.

b. \*(Believe) John to be the winner.

c. John \*(wants) to be the winner.

(14) further shows that prepositions and transitive verbs seem to assign Case to NPs next to them (14a-b), and that the subject of a tensed clause seems to be assigned Case by the finite verb (14c). According to Chomsky (1980, 1986a-b), as a finite verb expresses agreement (in contrast to infinitives which do not), tensed clauses are stipulated to

contain an abstract element AGR, which is usually considered to assign Case to the subject.

As a lexical head governs its complement(s) and the subject of a tensed clause is governed by AGR, interaction of government with Case theory requires that Case is uniformly assigned under government (Chomsky, 1986:188). E.g. the ungrammaticality in (14) arises because *John* cannot obtain government, therefore there is no Case.

But government is not the only factor for Case-assignment, which also depends on the properties of governing and governed categories (Horrocks, 1987). Verbs, for example, assign Case to their objects. But they do so if and only if they  $\theta$ -mark subject position (Burzio, 1986; Chomsky, 1986a:139), alias "Burzio's generalisation". Another example is that although the projections of lexical heads are also governors, only the heads assign Case (if they qualify to do so), and assign it to every element they govern, though only those that need Case receive it (Chomsky, 1986a:187-188).

Case also adopts the traditional case values (nominative, objective, possessive, etc.). It is said that prepositions and verbs assign objective Case and AGR nominative Case at S-structure, where Case is *structural*, whereas nouns and adjectives assign genitive Case and prepositions oblique Case at D-structure, where Case is *inherent* (Chomsky, 1986a:193ff; van Riemsdijk, 1981; Manzini, 1983). Case-assignment by various categories is listed in:

(15) Category	S-C	I-C	Level	Value
V	+		S-s	objective
P	+		S-s	objective
P		+	D-s	oblique
N		+	D-s	genitive
A		+	D-s	genitive
AGR	+		S-s	nominative
POSS	+		S-s	possessive

S-C = structural Case,            S-s = S-structure  
I-C = inherent Case,            D-s = D-structure  
AGR = agreement element        POSS = possessive marker

Inherent Case is assigned under  $\emptyset$ -marking, and differs from structural Case in that, adopting the terminology, it has to be 'realised' at S-structure by one means or another (Chomsky, 1986a: 193ff). The essence of inherent Case-realisation is that since it is assigned at D-structure, at which, however, no Case is allowed, inherent Case should be 'realised' later at S-structure. To illustrate this, consider:

- (16)a. [destruction [the city]]
- b. [destruction [of the city]]
- c. [[the city], 's destruction t<sub>i</sub> ]
- d. [proud [John]]
- e. [proud [of John]]

At D-structure, a noun/adjective assigns genitive Case (as well as a  $\emptyset$ -role) to its NP complement (16a and d), and this Case is only realised at S-structure by insertion of a non- $\emptyset$ -marking Case marker *of* (16b and e) (Chomsky, 1986a:193ff). Or, in the case of (16a and c), the complement moves into subject position and realises its Case by insertion of the POSS-marker (the context for POSS-insertion is [<sub>NP</sub> NP POSS] where the NP is genitive (Chomsky, *ibid.*)).

However, there is one thing missing in the table (15): how ditransitive verbs assign Case to their objects. It is said that in

V-NP1-NP2, e.g. *to give someone something*, NP2 is assigned inherent, objective Case (cf. Kayne, 1980a, 1984; Stowell, 1981; Radford, 1981; Sells, 1985; Chomsky, 1986a-b). But it remains unclear how this inherent Case is realised. Compare *to give someone something* with *to persuade someone of something*. The presence of *of* in the second case indicates that there should be a process of inherent Case-realisation (Chomsky, 1986a:191, 219). This may be related to the value of the inherent Case in question. *Something* in *to give someone something* bears objective Case, but genitive Case in *to persuade someone of something* (Chomsky, *ibid.*). But it needs to be better understood how the inherent, objective Case assigned to NP2 in V-NP1-NP2 is realised (see 2.3.2.3).

Two parameters in Case theory should be mentioned. One is Case adjacency (Chomsky, 1986a-b), which accounts for the data in (17) (Sells, 1985:54):

(17)a. I like flowers very much./\*I like very much flowers.

b. I gave the book to Bill./\*I gave to Bill the book.

The other parameter is Case directionality (Williams, 1984b; Koopman, 1984; Travis, 1984; Sells, 1985; A. Li, 1985), which, in English for instance, corresponds to the head-initial ordering, i.e. Case is assigned (by the head) to the right (Chomsky, 1986a-b).

I shall examine both parameters in Chinese in 2.3.

Move  $\alpha$  and bounding theory

The essence of Move  $\alpha$  is to move any category anywhere, subject to conditions. One basic condition is that no category can move into another which is already occupied by a lexical item. Other conditions include  $\theta$ - and Case-marking, bounding and binding conditions. I shall

briefly introduce them below.

Depending on the  $\theta$ - and Case-properties of positions where Move  $\alpha$  starts and ends, two principal types of movement are identified: A- and  $\bar{A}$ -movements. A-movement is from an A-position (=  $\theta$ -position) without Case to an  $\bar{A}$ -position (= non- $\theta$ -position) with Case. The motivation for movement is for the moved category to obtain Case. A-movement mainly involves NPs <2>, as NPs occupy A-positions and need Case. For example, we have already seen in (16a and c) that the NP [the city] moves into subject position for Case. Another example is English passives (Sells, 1985:43):<3>

- (18) D-stru: [np] AGR kiss-en Bill  
S-stru: Bill, AGR kiss-en t<sub>i</sub>

In (18), *-en* indicates the morphology of past participles in English, which are treated on a par with adjectives. Thus, *kiss-en* does not assign (structural) Case to *Bill*, nor inherent Case because adjectives in English assign inherent Case only to NPs through a non- $\theta$ -marking Case marker (i.e. *of*), as exemplified in (16d-e). As it is observed, English passives do not have such a form as *\*It was kissed of Bill*. Thus, *Bill* in (18) has to move into subject position for Case assigned by AGR. Besides, it is assumed that the morpheme *-en* also suspends the external  $\theta$ -role to subject position, so that the  $\theta$ -Criterion is not violated. Note that according to "Burzio's generalisation" (Chomsky, 1986a:139), the verb in (18) does not  $\theta$ -mark its subject, so that it does not Case-mark its object.

$\bar{A}$ -movement is from an A-position with Case to an  $\bar{A}$ -position without Case. Thus, the cause of movement is not Case but operator

movement, which is motivated by selectional properties of the lexicon (Chomsky, 1982, 1986a-b). The class of operators includes wh-items, binding NPs in COMP, quantifiers, and definite or indefinite determiners (Chomsky, 1986b:102). I shall briefly introduce below wh-items, quantifiers and binding NPs in COMP, which are relevant in this thesis.

Wh-items are so termed because the class of items that are moved in  $\bar{A}$ -movement typographically begin with *wh*- in English (e.g. (9)), from which most data in the exposition of GB are taken. This of course is not the case in Chinese. But to follow the convention, I shall call the Chinese equivalents of English wh-items "wh-items" as well. It is observed in natural languages that a certain group of verbs, e.g. *to ask* and *to wonder* in English, semantically select (henceforth s-select) wh-items in their complements. What types of complement these verbs select depends on categorial-selection (henceforth c-select). E.g. *to ask* may c-select both NPs and clauses as complement, but *to wonder* c-selects clausal complements only. The semantic as well as categorial conditions that a lexical item (e.g. a verb) must observe in selection of complement(s) are called 'selection restrictions' (cf. Pesetsky, 1983; Grimshaw, 1979, 1981).

GB specifies that when a verb s-selects a wh-item, it selects at the same time a COMP[+WH], which represents a COMP(lementiser) containing the abstract feature +WH. Such a COMP[+WH] is only identified by containing a wh-item. The category COMP is discussed in 2.1 and the feature  $\pm$ WH in 4.2. However, it is parametrical at which level a COMP[+WH] is first filled. In English, the fact that the sentences in (19) are ungrammatical before wh-items appear in clause initial position argues for syntactic wh-movement:

(19)a. \*John asked what? => What did John ask? <4>

b. \*John asked Mary had bought what. => J asked what M had bought.

c. \*Ed wondered Liz had met who. => Ed wondered who Liz had met.

Assuming that clause initial position is in COMP, (19) demonstrates that wh-items in English move into COMP in Syntax. The Chinese equivalents of \*(19), however, are grammatical, as we shall see in later chapters. Thus, wh-items in Chinese do not move in Syntax but remain in situ.

But, irrespective of syntactic wh-movement or wh-in-situ, GB specifies that all wh-items must be raised to COMP in LF, as they are counted as quantifiers and taken into account for semantic interpretations (Chomsky, 1986a-b). Thus, for example, wh-items in Chinese as well as in English will move into COMP in LF (Huang, 1982a-b; Aoun, 1986; Chomsky, 1986a-b).

Quantifiers are items which quantify nominal expressions, and they are raised to COMP in LF (Chomsky, 1986a-b). However, like wh-items, it is parametrical whether quantifiers undergo syntactic movement. Universal quantifiers in English, for example, do not move into COMP in Syntax (Chomsky, 1986a-b). However, I shall demonstrate in chapter 4 that universal quantifiers in Chinese must be raised to COMP in Syntax under certain conditions.

A binding NP in COMP refers to an NP which moves into COMP from other positions, such as subject/object position, and which binds a trace or a resumptive pronoun. Examples of this are topicalisation and left dislocation (Chomsky, 1977; Lasnik and Uriagereka, 1988). The movement of a binding NP differs from wh-movement in that it is not derived from D-structure.

An operator, e.g. a wh-item, can be empty, i.e. have no phonetic content. The symbol for an empty operator varies in different authors

(Chomsky, 1986a; Aoun, 1986; Radford, 1981). I shall argue in chapters 5-6 that there is an empty operator movement in descriptive and purposive clauses in Chinese, and shall, following Aoun (1986), adopt the symbol 'OP' for an empty operator.

Bounding theory restricts Move  $\alpha$  as follows. Structurally speaking, A-movement is local and structure-preserving, i.e. the movement is within the boundary of a certain domain conforming to X-bar theory, an NP or S for example (see Rizzi, 1982; Sportiche, 1981; van Riemsdijk, 1978). This domain is therefore called a bounding node/category (Emonds, 1976; Chomsky, 1977, 1986b). However,  $\bar{A}$ -movement can cross the boundary of one bounding category and create an adjoined position in COMP. The condition that restricts a single move of a category (e.g. a wh-item) to cross more than one bounding category is known as the subjacency condition (Chomsky, 1973), which subsumes such conditions proposed earlier in Ross (1967) as the Wh-Island Constraint and the Complex NP Constraint (CNPC). Nevertheless, the subjacency condition may not affect a wh-item moving from COMP to COMP, because in such a fashion, the wh-item crosses one bounding category at one time, thus not violating the subjacency condition, as we see in (9) where, though COMP is not indicated, a wh-item moves from subject/object position first to the initial position of the embedded clause, then to that of the matrix clause (also see Chomsky, 1973, 1977).

Before discussing how Move  $\alpha$  is subject to binding conditions, I shall first come to the issue which we have seen in examples (9), (11), (16) and (18) but which has not yet been fully introduced, namely, any moved category leaves co-indexed trace(s) behind in its original position(s), creating a chain  $[\alpha_i, t_i \dots t_i]$  (Chomsky, 1982:6; 1986a:95ff, 135ff). In terms of  $\theta$ - and Case-marking, a chain is  $\theta$ - or

Case-marked if one of its members is so marked. A  $\theta$ -role is always associated with a trace in a chain by both A- and  $\bar{A}$ -movement, but Case is associated with  $\alpha$  in A-movement and with a trace in  $\bar{A}$ -movement.

Apart from A- and  $\bar{A}$ -movement, there are other types of movement, such as V-movement, (Koopman, 1984; Huang, 1988), which may exist in Chinese and which I shall discuss in 2.3.

### Binding theory and empty categories

Roughly, binding theory is responsible for interpreting the relations between NPs in terms of antecedency. Let us first look at the typology of overt NPs. NPs fall into three categories: a) anaphors, such as *himself* and *each other*, b) pronominals, such as *he* and *him*, and c) referential expressions (R-expressions), which are names such as *John*, and ordinary NPs such as *the window*. In terms of antecedency, an anaphor must have an antecedent, a pronominal may have an antecedent, and an R-expression need not have an antecedent (Chomsky, 1986b:101ff). To capture these facts in structural terms, binding theory specifies the following (Chomsky, 1986a:166-169, 1986b:188):

- (20) A. An anaphor is bound in its governing category;
- B. A pronominal is free in its governing category;
- C. An R-expression is free (in any governing category).

The contents of (20) are referred to, respectively, as (Binding) Condition A/B/C. The technical points in (20) are explained below.

Firstly, 'binding' is defined as follows (Chomsky, 1986a:164-165):

- (21) X binds Y if X c-commands and is co-indexed with Y.

For (20), we have already defined 'c-command' in (7) and what remains to

be explained is 'co-indexing'. Co-indexing starts at D-structure, where subjects of clauses are said to be 'automatically' co-indexed with AGR (Chomsky, 1986a:162, 1986b:211) so as to express subject-predicate agreement, and each A-position 'freely' receives an index (Chomsky, 1986a:172-173), but  $\bar{A}$ -positions do not (Chomsky, 1982:59ff). At S-structure, Move  $\alpha$  creates indices, i.e.  $\alpha$  and its trace are co-indexed as the result of a movement, such as we see in (9), (11) and (16).

Secondly, a governing category is the domain which contains an anaphor/pronominal/R-expression, a governor of this anaphor/pronominal/R-expression, and a subject (Chomsky, 1986a:169). As a governing category requires a subject, it can only be an S or an NP with a subject. This condition is often referred to as the 'specified subject condition' (SSC) (Chomsky, 1977, 1986a:106, 169).

Returning to (20), to illustrate Conditions A, B and C, consider:

- (22)a. [<sub>S</sub> John<sub>i</sub> likes himself<sub>i</sub> ]  
 b. \* [<sub>S</sub> himself<sub>i</sub> INFL likes John<sub>i</sub> ]  
 c. \* [<sub>S</sub> John<sub>i</sub> likes him<sub>i</sub> ]  
 d. \* [<sub>S</sub> he<sub>i</sub> likes John<sub>i</sub> ]

(22a) meets Condition A as *himself* is bound by its antecedent *John*;  
 (22b) violates both Conditions A and C as *himself* is free and *John* is bound; *him* is bound in (22c) and so is *John* in (22d), thus violating Conditions B and C respectively. The governing category of all cases in (22) is the S, in which the governor for *himself/him/John* in object position is the verb *likes* and that for *himself* in subject position is INFL.

It is observed in English that anaphors occur only in object position (22a-b), and pronominals and R-expressions occur in both subject and object position (22c-d). As the subject is the most

prominent nominal element of a sentence (i.e. it triggers subject-predicate agreement), the fact that anaphors are excluded from this position is termed the 'nominative island condition' (NIC) (Chomsky, 1980, 1986a:168-169).

However, anaphors do occur in subject position in NPs in English <5>, such as in (23) below. The problem, to be very brief, arises in these cases of how anaphors are bound, as required by Condition A. As stated in this condition, anaphors have to be bound in their governing category, which in the case of (23) cannot be the NP containing an anaphoric subject, because it does not contain an antecedent binding that anaphor (i.e. it is free. Cf. (22b)). To solve this problem, the concept of 'accessible SUBJECT' is introduced into a governing category (Chomsky, 1986b:209ff). Instead of a subject, a governing category for an anaphor may contain an accessible SUBJECT. Informally, SUBJECT refers to AGR, and Accessible means that AGR c-commands the relevant anaphor without co-indexing it twice. Consider:

(23)a. [they<sub>i</sub> AGR like [<sub>NP</sub> each other<sub>i</sub>'s pictures]]

b. [they<sub>i</sub> AGR say that [<sub>NP</sub> each other<sub>i</sub>'s pictures] AGR are on sale]

In (23a), the governing category for *each other* is the sentence itself, which contains an antecedent of *each other* and an AGR. The AGR is a SUBJECT and is accessible to *each other* because it c-commands the NP containing *each other*. In (23b), both AGRs c-command the NP containing *each other*, but only the AGR in the matrix clause is accessible to *each other*, as the AGR in the embedded clause is already co-indexed with the NP [each other's pictures] (recall that AGR is co-indexed with the subject of a clause). Thus, making this AGR accessible to *each other* would result in co-indexing the NP twice, violating the so-called '*i*-within-*i* condition' (Chomsky, 1986a:174-177). So, if an anaphor

has no (accessible) SUBJECT in its own domain (an NP or S), a higher domain which contains a SUBJECT accessible to the anaphor will be taken as its governing category (Chomsky, 1986b:211ff).

In Chinese, anaphoric subjects occur in sentences as well as in NPs, so that the NIC is absent. Besides, given that binding of anaphoric subjects would have to be under accessible SUBJECT and that Chinese does not have AGR, SUBJECT and its accessibility have to be re-defined for Chinese. I shall return to these issues in 2.4.

Now let us look at the typology of empty NPs. It is argued that for each of the three types of overt NPs, there is an empty counterpart (24a-c), and that there is an anaphoric-pronominal-like empty element PRO (24d), which does not have an overt counterpart:

- (24) a. anaphor           - NP-trace
- b. pronominal     - pro
- c. R-expression - wh-trace/variable
- d.                 - PRO

Both NP-trace and wh-trace are created by  $\text{Move } \alpha$ , such as we see in (9), (11), (16c) and (18). 'pro' applies to languages where pronominals may be absent from subject position, known as the 'pro-drop' phenomenon (Perlmutter, 1971). Chinese, as we know, is a pro-drop language. The binding conditions apply only to NP-traces, wh-traces and pro, but not to PRO, which due to having no overt NP counterpart falls under the theory of control (see below).

Where  $\text{Move } \alpha$  applies, the moved category and its trace(s) are subject to relevant binding conditions. A NP-trace is A-bound, while a variable is  $\bar{A}$ -bound (Chomsky, 1986b:184).

## Control theory

The term 'control' refers to the manner in which antecedency between an overt NP and PRO is arranged. PRO is pronominal, as its name suggests. But PRO behaves like an anaphor in many cases for having to have an antecedent. So, it is also classified as a pronominal anaphor in nature. Partly because of this, PRO is not subject to binding conditions because it is not possible for an element to be a pronominal and an anaphor at the same time under binding conditions, which require anaphors to be bound but pronominals to be free (Chomsky, 1986a-b). Other possible reasons for PRO not to be under binding conditions are that control may involve information other than syntax (Sells, 1985).

Although principles concerning control still need to be better understood (for discussions in this respect see Manzini (1983), Bouchard (1984), Koster (1984) and Brody (1985) amongst others), some theorems in control theory have been adopted in practice. These are, firstly, the Avoid Pronoun Principle (Chomsky, 1986b:65), which captures the Switch Reference phenomenon (Jacobsen, 1967) illustrated below:

- (25)a. John<sub>i</sub> would prefer [<sub>i</sub>his<sub>j</sub> going to the theatre]  
(John and 'his' may or may not be in coreference.)
- b. John<sub>i</sub> would prefer [PRO<sub>i</sub> going to the theatre]  
(John and PRO must be in coreference.)

Not using the pronominal *his* in (25a) has avoided a possible change in reference of the subject of the gerund clause (or a NP). Thus, the Avoid Pronoun Principle assumes that grammar is constructed in such a way that an empty copy of a pronominal, i.e. PRO, is used wherever it is possible not to use a pronominal. Secondly, PRO is co-indexed with a NP which is at a 'minimal distance' or the 'closest' to PRO, where 'minimal

or the closest distance' may be defined as follows: X is closer to Y than Z is if X c-commands Y but Z does not c-command Y; in case both X and Z c-command Y, X is closer to Y than Z is if X but not Z occurs in the same clause as Y does, or if there are fewer clause boundaries between X and Y than between Z and Y (Rosenbaum, 1967; Chomsky, 1980; Huang, 1984:552-553). Thirdly, PRO is  $\theta$ -marked independently of its antecedent but not Case-marked or governed (Chomsky, 1986b:56, 191)<6>. Fourthly, PRO is not subject to the subjacency condition (Chomsky, 1986b:56).

In the present study, I shall investigate three specific control structures in Chinese within the control theory outlined above. Two of these structures are subject-control in purposive constructions and object-control in the so-called Equi constructions (cf. Chomsky, 1986a: 112ff, 124), as shown in (26a-b):

(26)a. NP<sub>i</sub> [<sub>VP</sub> [<sub>VP</sub> V NP] [<sub>S</sub> [<sub>S</sub> PRO<sub>i</sub> to VP]]]

b. NP [<sub>VP</sub> V NP<sub>i</sub> [<sub>S</sub> [<sub>S</sub> PRO<sub>i</sub> to VP]]]

(26a-b) are based on English, as in *John<sub>i</sub> bought a present [PRO<sub>i</sub> to amuse Mary]* and *Mary told John<sub>i</sub> [PRO<sub>i</sub> to repair the car]*. It is said that the subject NP in (26a) and the object NP in (26b), respectively, control PRO in the infinitival clause, as the co-indexing shows. The NP which controls PRO is called the 'controller' (Chomsky, 1986a:124-125). The controller may lose its control over PRO, if it binds a trace, such as in *John<sub>i</sub> is too stubborn [PRO to talk to t<sub>i</sub>]*, in which PRO has an independent reference (Chomsky, 1986a:128).

As stated earlier, PRO occurs in an ungoverned position. (26) demonstrates this by showing that PRO occurs in subject position of an

infinitival (= untensed) clause, in which there is no AGR to govern subject position. As Case is assigned under government, overt NPs are barred from this position, as illustrated in:

(27)a. \*John<sub>i</sub> bought a present [he<sub>i</sub> to amuse Mary]

b. \*Mary asked John<sub>i</sub> [he<sub>i</sub> to repair the car]

In (27), the result is obvious because, among other things, of the presence of the infinitival particle *to*, which means no AGR, hence no government to subject position.

In Chinese, which does not manifest tense or agreement, nor differentiate finite verbs and infinitives, the central issue concerning control is how to define PRO positions in Chinese. I shall discuss this issue in 2.2.3, and examine Chinese equivalents of (27) in chapters 6-7. A third type of control structure (external-object control) is investigated in chapter 8.

## 1.2 Constituency

In GB, constituency is subsumed into subcategorisations of the lexicon which specify the syntactic relations between each lexical entry and its complement(s). The Projection Principle implements the notion of subcategorisation at all levels of syntactic representation. However, this notion is not adequate either in theory or in practice. It is not adequate in theory because there are other constituents which are not complements, such as modifiers/adjuncts. The only non-complemental constituent that is specified in GB, through the Extended Projection Principle, is the subject of a clause. The syntax of modifiers vs. complements has been recognized as a highly complex one (Hornstein and Lightfoot, 1981; Radford, 1981), and the recent development on this

issue is seen outside the GB theory (Sag and Pollard, 1987; Huddleston, 1988). In practice, subcategorisation is only determined by complex syntactic diagnosis on the basis of various types of linguistic evidence. For those relatively well-studied languages like English, from which the core formulation of GB has drawn data, there is a fair amount of agreement on what structure should be assigned to a certain string of words (Sells, 1985:9). For a language like Chinese, which we know much less than English in terms of constituency <7>, applying GB (or indeed any other theory) to it requires, in my view, great caution in characterising its word order and constituency, both of which should be determined on the basis of sufficient evidence. The latest work on quantificational phrases (QPs) in both English and Chinese by Aoun and A. Li (1989), for example, has revealed that differences in interpretations of QPs between English and Chinese result from differences in constituency between these two languages.

For these reasons, I shall carefully treat the issue of constituency where necessary in the present study, and demonstrate that this in fact helps to determine the scope of the explanatory options of GB for the relevant data in Chinese. I shall also show some discrepancies in the early GB literature regarding Chinese which are due to lack of evidence on constituency.

Notes:

<1> This is considered impossible under the ECP in Chomsky (1986b), because successive-cyclic wh-movement is related to the so-called

bridge verbs, which are supposed to govern a trace in COMP but not in subject position of a complement clause, contrasting with the so-called raising verbs that govern a trace in subject position of a complement clause (see 2.2.2.2). Van Riemsdijk & Williams (1985:295) suggest that a bridge verb should properly govern a trace in COMP through a process of S'-transparency sensitive to  $\bar{A}$ -position, while a similar process sensitive to A-position applies to raising verbs, including verbs capable of exceptional Case-marking (ECM). However, in a theory that does not adopt the ECP, things may be viewed differently. E.g. in Aoun's (1986) generalised binding framework, whether successive-cyclic wh-movement occurs or not depends on whether a variable needs to be locally bound (see 2.4.2).

<2> Stowell (1981) suggests that categories other than NPs may be associated with A-movement.

<3> GB does not seem to specify why the subject position of a passive clause remains empty after lexical insertion, though it stipulates that only a  $\theta$ -marked subject position will be filled by a lexical item (Horrocks, 1987:150). However, given that the subject position of a passive clause needs to be empty so as to allow [NP, VP] to move into it, and given the assumption that a transitive verb in the lexicon s-selects and c-selects its subject and object, why does it select both subject and object in one case, which is supposed to be an active clause, but object only in another case, which is supposed to be a passive clause? It therefore seems that there should be coded channels of lexicon output, e.g. X channel for verbs with a subject and Y channel for those without. See 3.5 for further discussion.

<4> The string on the left of the arrow is acceptable if it is used as

an echo question.

<5> When this occurs, the complementary distribution between pronominals and anaphors may break down in NPs. There is debate over how to approach this issue. For discussion see Chomsky (1982), Huang (1982b) and Aoun (1986).

<6> PRO could be considered governed in a different theory from Chomsky's (1986a-b). See Koster (1981, 1984, 1987), Sportiche (1983) and Bouchard (1984).

<7> Little attention has been paid in the literature to constituency in Chinese since Simon (1957).

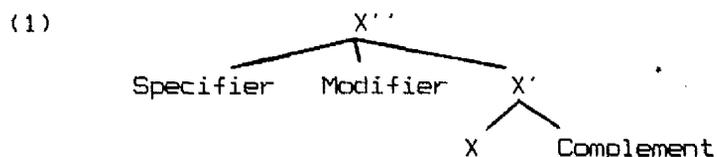
## Chapter 2 Some GB Modules with Reference to Chinese

In this chapter, I shall discuss the GB modules outlined in chapter 1 with reference to the Chinese language. The discussions in this chapter will lay the foundation for those in the chapters to come.

### 2.1 X-bar Theory

#### 2.1.1 Phrasal and Clausal Structures

Given the rule schema in (5) of 1.1, I propose a maximal projection of  $X''$  for lexical categories in Chinese and outline its phrase structure schema in (1). Evidence in support of (1) will become apparent as we proceed.



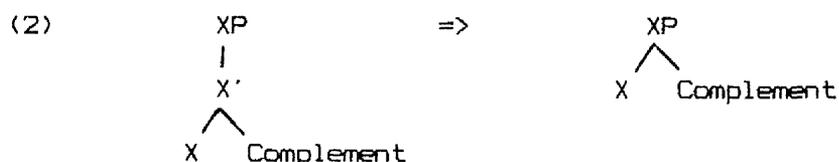
The importance of (1) is its hierarchical structure, not its relative order of constituents. The technical points about (1) are explained below.

(1) represents a phrasal structure headed by a lexical category (noun, verb, adjective or preposition) in its maximal projection. In this maximal projection,  $X$  is the head, which can be  $N$ ,  $V$ ,  $A$  or  $P$ ; complements are constituents that the head subcategorises for, and are sisters to the head; constituents that the head does not subcategorise for are specifiers and/or modifiers, which are sisters to  $X'$ . Under certain conditions, complements can also be sisters to  $X'$ , and are then called external complements to the head (see 3.2.3 and 8.2). The concept

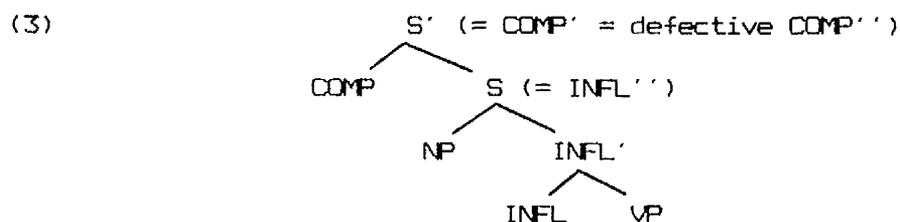
of subcategorisation will be discussed later in 2.1.2.

The prototypical type of complement in Chinese is an NP, taken by, e.g. a verb or a preposition. A specifier is also often an NP, as 'san-ge' (three-m.p) in 'san-ge ren' (three people). A modifier can be a PP, such as 'zai Zhongguo' (in China) in 'Ta zai Zhongguo zhu' (S/He lives in China). All these will be demonstrated further as we proceed.

As stated in 1.1, X'' is equivalent to XP (NP, VP, AP or PP), which I shall adopt throughout the discussion. As a typographical convention as well as for simplicity in my presentation, the single-bar notation, X', will be left out, if it does not have a sister, i.e.



As for the clausal structure schema, I adopt the one suggested in Chomsky (1986a:161):



As shown in (3), the head of S is INFL, "consisting of tense and agreement elements and modals. By phonological rules, the abstract tense and agreement elements are generally associated with a verb" (Chomsky, 1986a:161). The NP represents the grammatical function 'subject of' and is defined as the NP of S, or more generally the NP of X'', given INFL = X. The category COMP is the head of S' and can be filled or null. For example, the COMP of a relative or appositive clause in Chinese is filled by 'De', but that of a matrix and a complement clause is null. We shall see these as our discussion proceeds. The motivation for defining

S' as a defective COMP'' is to take S' as a maximal projection (Chomsky, 1986a:161). For the purpose of the present study, I shall call the S in (3) a minimal clause and the S' its root clause <1>.

There should be two immediate modifications for Chinese concerning (3). Firstly, Chinese is not an inflectional language, for which INFL is not a proper category. Chinese verbs express aspect rather than tense, and they do not manifest subject-predicate agreement (in person, number and gender). So, a category in Chinese that performs a similar function to INFL in (3) should consist of an aspect element and modals. However, I do not intend to propose a substitute for INFL for Chinese, but to adopt it in the present study, following other authors such as Huang (1982b, 1984, 1988) and Aoun (1984, 1986)<2>.

Secondly, the complement of INFL is not necessarily VP in Chinese, but can be VP or AP, for example,

(4)a. Ta lai-le.

    V  
    3sg come-asp

- S/He has come.

b. Ta hen gao.

    ADJ  
    3sg very tall

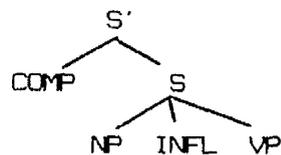
- S/He is very tall.

The solution to this problem can be either to propose a higher category, e.g. PredP (predicate phrase) to cover both VP and AP, as suggested in Mei (1973) following Chomsky (1965), since both VP and AP can constitute the predicate of a sentence in Chinese, or to treat adjectives structurally as verbs when they are used as predicates, as some authors have suggested (see W. Wang, 1964:198-199; Tang, 1972:169-172; Teng, 1975:165; Huang, 1982b:93).

An intermediate category such as PredP would cause an alteration to

the phrase structure schema in (1), and more importantly, would need independent justification, which is beyond my concern here. So, in the present study, I shall simply follow the treatment of other authors, i.e. structurally taking adjectives functioning as predicates to be verbs. In addition, as INFL' is purely a meta-category, it is often left out in a structural representation. Thus, in the present study we have the following clausal schema for Chinese:

(5)



where NP is the subject of S, written as [NP, S], and VP the predicate of S, written as [VP, S]. If the VP contains an NP, the NP will be defined as the object of VP, written as [NP, VP].

### 2.1.2 The Structure of NPs

As stated in 1.1, the general assumption that all syntactic categories conform to X-bar theory should be based on empirical evidence as far as individual languages are concerned. Given the proposed structural schema in (1), the question concerning X-bar syntax in Chinese is whether the intermediate level X' should exist. In this section, I shall examine this issue based on evidence from the internal structure of NPs, and evidence from other categories, such as VPs, will automatically follow in the forthcoming chapters.

It has been observed in Chinese that the particle 'De' follows adjectives modifying nouns in accordance with the semantic distinction between 'attributive' and 'descriptive' natures (Ding et al, 1964:42-44; Zhu, 1984:142-143; Tang, 1985a:145). For example,

- (6)a. hei ren                                   cf. c. hei de ren  
       black person                           black p. person  
       - an African                           - a dark skin person
- b. xiao qiche                               cf. d. xiao de qiche  
       small motor-vehicle                small p. motor-vehicle  
       - a car                                - a small motor vehicle

When an adjective with 'De' and one without 'De' both modify a noun, the word order dictates that the former must precede the latter, e.g.

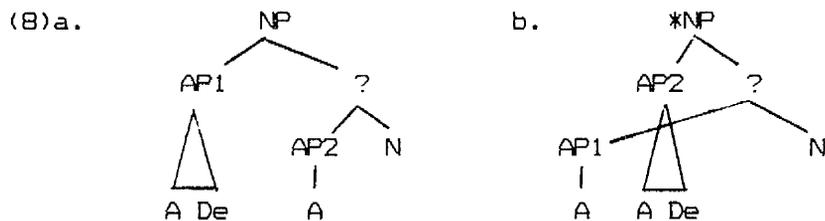
- (7)a. [da de] [bai] gou /\*[bai] [da de] gou  
       big p. white dog  
       - a big white dog
- b. [meili de] [gao] shan /\*[gao] [meili de] shan  
       beautiful p. high mountain  
       - a beautiful high mountain

Given (6-7), questions arise as to why the word order A-De-A-N should be preferable to \*A-A-De-N, and structurally, what the difference is between (6a-b) and (6c-d).

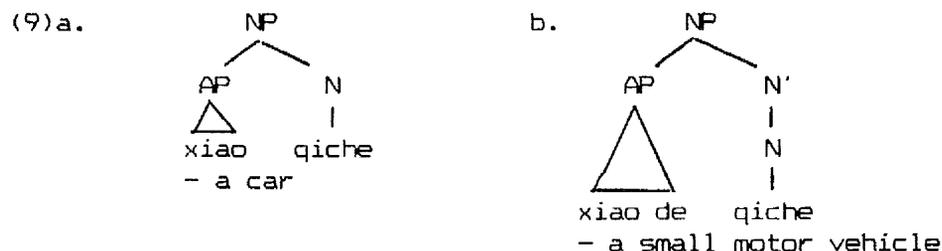
Suppose that X-bar syntax does not enter the phrasal structure in Chinese, and that we adopt the simple notation "XP → ...X...". Then, we have "AP → A (De)", and "NP → AP N" for representing the data in (6). The problem is, however, that the representation "NP → AP N" does not distinguish (6a-b) from (6c-d), although there is a difference in meaning between them. Furthermore, when coming to the data in (7), where A-De has to precede A in A-De-A-N, what we have in effect is that the "NP → AP<sub>1</sub> AP<sub>2</sub> N", where AP<sub>1</sub> = A-De and AP<sub>2</sub> = A. This means that the notation "XP → ...X..." becomes context-sensitive, a result which we may not want.

Besides, "NP → AP<sub>1</sub> AP<sub>2</sub> N" may not be the right representation for

the data in (7a), because, for example, AP1 occupies a higher node than AP2 in relation to the head N, as in (8a):



In (8), '?' represents an unnamed phrasal category, which cannot be N again, because a) N is a lexical category, and b) an XP cannot have two heads (Emonds, 1976:15). If (8a) is valid for A-De-A-N in (7a), then (8b) explains why \*A-A-De-N in (7b) is barred: it creates a crossing branch, which is believed to be impossible in the phrasal structure of any natural language (Radford, 1981:99). Furthermore, if we propose a category N' to replace '?' in (8a), then the difference between (6a-b) and (6c-d) is that the A in the former is a complement to N and the A-De in the latter a modifier to N, as shown in (9a) and (9b) respectively:



Given (8a) and (9a-b), the key evidence for the N' notation should be that the sequence A-De occupies a higher node than the sequence A in relation to N, when A-De-N, A-N, or A-De-A-N are each defined as an NP. <15>

The evidence we are looking for is as follows. Firstly, as shown in (6), 'De' is responsible for the attributive property of adjectives modifying nouns. However, some adjectives may optionally take 'De' associated with such a property. Thus, ambiguity arises, e.g.

(10)a. xin shu

new book

- newly published books

- new books

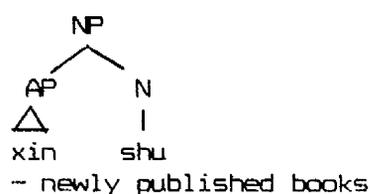
b. xin (de) shu

new p. book

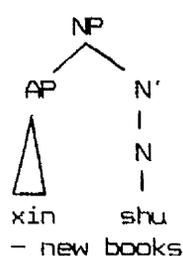
- new books

To account for the ambiguity in (10a) based on (10b), we may propose the structures in:

(11)a.



b.



Given (10b) which has the same interpretation as one of the readings of (10a) when 'De' optionally occurs with the adjective, the structural account in (11) of the ambiguity in (10a) is therefore plausible, supporting the analyses in (8a) and (9a-c).

A second piece of evidence may be derived from facts of subcategorisation. According to (8a) and (9a-b), an AP containing 'De' is a sister to the N', but a bare AP is a sister to the N. This means that the former is not a subcategorised constituent for the N, but the latter is. Radford (1981:126), following Hornstein and Lightfoot (1981), proposes that, subject to nonlinguistic (e.g. pragmatic) constraints, if an item of Type A can occur with a large number of items of Type B, then that item of Type A is unlikely to be subcategorised by any item of Type B; conversely, if an item of Type A can only occur with a particular item or a small group of items of Type B, then that item of Type A is

subcategorised by the specified item(s) of Type B <3>. For example, the PP *with long hair* in English is argued not to be subcategorised by the noun *student* in *a student with long hair*, but the PP *of physics* is subcategorised in *a student of physics*, because while the PP *with long hair* can occur with a considerable number of other nouns, the PP *of physics* cannot, as shown in (Radford, 1981:126):

- (12)A: a. a student with long hair  
b. a boy with long hair  
c. a girl with long hair  
d. a cat with long hair  
e. a mouse with long hair  
f. a rabbit with long hair  
g. etc.

- B: a. a student of physics  
b. \*a boy of physics  
c. \*a girl of physics  
d. \*a cat of physics  
e. \*a mouse of physics  
f. \*a rabbit of physics  
g. etc.

Given Radford's (1981) principle, first consider the data in Chinese in:

- (13)a. [meili de] shan - beautiful mountains  
A De N  
b. [meili de] fangzi - beautiful houses  
A De N  
c. [gao] shan - high mountains  
A N  
d. [gao] fangzi - high houses  
A N

An [A De] in (13a-b) and a bare [A] in (13c-d) are modifying the same pair of nouns. The question is whether the [A De] in (13a-b) and the [A] in (13c-d) are both subcategorised by the following N. To answer this question, compare (14A) and (14B) below:

- (14)A: a. [meili de] guniang - beautiful girls  
b. [meili de] chengshi - beautiful cities  
c. [meili de] guojia - beautiful countries  
d. [meili de] senlin - beautiful forests  
e. [meili de] huayuan - beautiful gardens  
f. [meili de] hai - beautiful sea  
g. [meili de] tiankong - beautiful sky  
h. [meili de] tianye - beautiful fields  
i. etc.

- B: a. \*[gao] guniang -  
b. \*[gao] chengshi -  
c. \*[gao] guojia -  
d. \*[gao] senlin -  
e. \*[gao] huayuan -  
f. \*[gao] hai -  
g. \*[gao] tiankong -  
h. \*[gao] tianye -  
i. etc.

In (14A), we find that the [A De] from (13a-b) can modify a further group of nouns, but the [A] from (13c-d) cannot modify any noun of the same group, resulting in the fact that the [A De] can occur with a considerably larger number of nouns than the [A] can. This seems to suggest, under Radford's (1981) principle, that the [A De] in (13a-b) is

not subcategorised by the N, but that the [A] in (13c-d) is. Given (1) in which a non-subcategorised constituent is a sister to the N', and a subcategorised one is a sister to the N, the data in (13-14) thus support the analyses in (9a-b) and (8a).

A further piece of evidence can be derived from data showing coordination deletion (CD) <4>. But before examining the relevant data, let me introduce the relevant principles. As previous studies show, CD in Chinese observes three conditions (Tai, 1969; He, 1987): a) the 'peripherality condition' (Oirsouw, 1983:312-314, 1985:365), requiring an identical element or string undergoing deletion to be peripheral in its constituent, b) the 'directionality condition' (Ross, 1970:249-259; Oirsouw, 1983:314-318), stating that identical elements or strings on the left periphery delete forward and those on the right periphery delete backward, and c) the 'immediate dominance condition' (IDC) (Tai, 1969:79), requiring that an element or string undergoing deletion must be immediately dominated by a conjunct. Together, these three conditions make the following predictions (showing the right peripheries only):

(15)a. Given a sequence  $Q_1-Q_2- \dots -Q_n$ ;  $Q$  = an element or string;

b. If  $Q_1-Q_2- \dots -\emptyset$ ;  $\emptyset$  = a deleted element or string,  
then  $Q_1-Q_2- \dots -[Q_n]$ , [ ] = a constituent immediately dominated by a conjunct;

c. If  $*Q_1-Q_2- \dots -\emptyset$ , then  $Q_1-Q_2- \dots -[Q_{n-1} Q_n]$ .

(15) is recursive, for example, (16a-b) is based on (15b) and (16c) on (15c):

(16)a. Given  $Q_1-Q_2- \dots -Q_{n-1}-\emptyset$  and if  $Q_1-Q_2- \dots -\emptyset-\emptyset$ ,  
then  $Q_1-Q_2- \dots -[Q_{n-1}]-[Q_n]$ ;

b. Given  $Q_1-Q_2- \dots -Q_{n-1}-\emptyset$  and if  $*Q_1-Q_2- \dots -\emptyset-\emptyset$ ,  
then  $Q_1-Q_2- \dots -[Q_{n-2} Q_{n-1}]-[Q_n]$ .

c. Given  $*Q_1-Q_2- \dots -Q_{n-1}-\emptyset$  and if  $*Q_1-Q_2- \dots -\emptyset-\emptyset$ ,  
 then  $Q_1-Q_2- \dots -[Q_{n-2} Q_{n-1} Q_n]$ .

Given (15-16), let us examine the sequence A-De-A-N with which we are concerned. Consider:

(17)a. meili de gao shan, xiongwei de gao shan  
 A De A N A De A N  
 beautiful p. high mount. magnificent p. high mount.

- beautiful and magnificent high mountains

b. \*meili de gao \_\_, xiongwei de gao shan  
 A De A N A De A N

c. meili de \_\_ \_\_, xiongwei de gao shan  
 A De A N A De A N

- beautiful and magnificent high mountains

(18)a. meili de gao shan, meili de da hai  
 A De A N A De A N  
 beautiful p. high mount. beautiful p. big sea

- beautiful high mountains and big oceans

b. \*meili de gao shan, \_\_ de da hai  
 A De A N A De A N

c. meili de gao shan, \_\_ \_\_ da hai  
 A De A N A De A N

- beautiful high mountains and big oceans

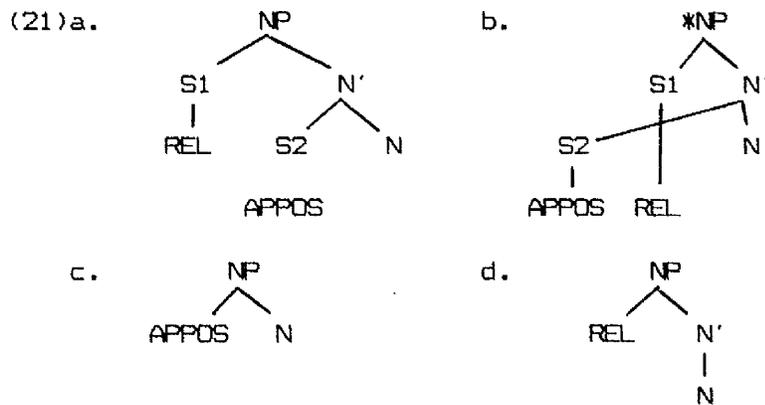
As we see, the identical N in (17b) cannot be deleted unless deleted together with the preceding A; similarly, the identical A in (18b) does not delete unless together with the following De. This indicates that the sequence A-N in (17) and A-De in (18) should be treated as one single constituent, i.e. [A N] and [A De], which are immediately dominated by the conjunct (= NP). Given [A De] or [A] = AP, the rest of the issue is what node should dominate [AP N] which is in turn dominated by the conjunct NP. As this node cannot be NP (the conjunct) or N (the head), proposing an intermediate level N' is therefore logical, hence supporting the analyses in (8a) and (9a-b). Note that (17c) which

deletes forward, and (18c) which deletes backward, also demonstrate that CD in Chinese complies with the 'directionality condition'.

Finally, evidence in support of the structures (8a) and (9a-b) also comes from NPs containing clauses. It is observed in Chinese that either a relative or an appositive clause can modify a noun. But when both types of clause modify a noun at the same time, the word order must be that the relative clause precedes the appositive. For example,

- (19)a. [ta ti de] jianyi  
REL  
3sg raise Comp suggestion  
- the suggestion s/he put forward
- b. [women yinggai zhao gongzuo de] jianyi  
APPOS  
we should seek job Comp suggestion  
- the suggestion that we should look for jobs
- c. [ta ti de] [women yinggai zhao gongzuo de] jianyi  
REL. APPOS.  
3sg raise Comp we should seek job Comp suggestion  
- the suggestion s/he put forward that we should look for jobs
- d. \*[women yinggai zhao gongzuo de] [ta ti de] jianyi  
APPOS. REL.
- (20)a. [ta shuo de] hua  
REL  
3sg say Comp words  
- the remark s/he made
- b. [women dou shi bendan de] hua  
APPOS  
we all be fool Comp words  
- the remark that we were all fools
- c. [ta shuo de] [women dou shi bendan de] hua  
REL. APPOS.  
3sg say Comp we all be fool Comp words  
- the remark s/he made that we were all fools
- d. \*[women dou shi bendan de] [ta shuo de] hua  
APPOS. REL.

To account for the compulsory word order REL-APPOS-N shown in (19-20), it is inadequate simply to give a context-sensitive representation such as "NP → S1 S2 N", where S1 = REL and S2 = APPOS. Moreover, this representation is defective if S1 occupies a higher node than S2 in relation to the N. In fact, a relative clause is more likely to occupy a higher node than an appositive clause, because this immediately accounts for the ill-formed word order \*APPOS-REL-N in contrast to REL-APPOS-N, as in (21a-b):



Given (21a-b), we thus reach (21c-d), which correspond to (9a-b). That is to say that the internal structure of NPs containing clauses is on a par with that containing APs. Both support the intermediate notation N'.

In addition to what we have observed in (19-20), Tang (1985a:150) noted that 'De' could be optional in appositive clauses, but is obligatory in relative clauses. Thus, summarising the parallels between NPs containing APs and those containing clauses, we have:

- |        |             |     |                      |
|--------|-------------|-----|----------------------|
| (22)a. | AP-N        | cf. | APPOS-(De)-N         |
| b.     | AP-De-N     | cf. | REL-De-N             |
| c.     | AP-De-AP-N  | cf. | REL-De-APPOS-(De)-N  |
| d.     | *AP-AP-De-N | cf. | *APPOS-(De)-REL-De-N |

(22) complements our analyses that NPs containing APs and clauses share

the same structure (compare (8a-b) and (14a-b), and (9a-b) and (21a-b)).

To summarise, evidence based on the internal structure of NPs suggests that an intermediate phrasal representation X' is feasible in Chinese, supporting the phrase structure schema in (1).

## 2.2 Government

I shall discuss three issues related to government in this section: INFL, the ECP and PRO positions in Chinese.

### 2.2.1 INFL

As stated in 1.1, INFL may contain AGR and TNS, as in English (cf. Chomsky, 1986a-b). In Chomsky (1980), TNS governs (nominative) [NP, S]. But a modification is made in Chomsky (1986b:170) that AGR should govern [NP, S]. Nevertheless, TNS may still be taken as the governor of [NP, S] in languages which express tense but not agreement, such as in Vata and Gbadi (Koopman, 1984:72ff).

In Chinese, which manifests neither agreement nor tense (see 2.1), it has been suggested that INFL itself is the governor of [NP, S] (Huang, 1982b, 1984, 1988). A problem with Chinese only arises in the case of [PRO, S], which should not be governed or Case-marked. That is, if every clause contains INFL, as generally agreed in the literature, why does INFL govern [NP, S] but leave [PRO, S] out? Note that this is not a serious problem so far with languages expressing agreement and/or tense, where AGR or TNS are taken as the governor of [NP, S]. In these languages, when AGR or TNS are absent in certain nonfinite clauses, these clauses normally contain [PRO, S].

Huang (1982b, 1984) suggested that aspect-marking might play a part in distinguishing between finite and nonfinite clauses in Chinese. Unfortunately, this is not true. Both [NP, S] and [PRO, S] may or may not occur with an aspect-marker, as we shall see in 2.2.3. In fact, since the government of [NP, S] in Chinese may be in the absence of AGR, TNS or even ASP(ect), and since INFL occurs with both [NP, S] and [PRO, S] in this language, a more fundamental issue should be addressed, i.e. the nature of INFL itself.

Here, I argue that INFL can be either nominal or non-nominal, marked as [+N]/[-N]. In the case of Chinese, clauses with an [NP/pro, S] contain an INFL[+N], but those with a [PRO, S] contain an INFL[-N]. INFL of the former type governs and Case-marks [NP/pro, S], but that of the latter type does neither. In what follows, I deduce evidence for this argument.

The point is never overlooked in Chomsky (1986a-b) that AGR is nominal and responsible for both governing and Case-marking [NP, S] in languages like English. The fact that AGR reflects the grammatical features of [NP, S] such as person, number and gender implies that AGR may be taken as the grammatical copy or identifier of [NP, S] and exists solely for the purpose of executing those features (by way of phonological rules). This view is all the more convincing by virtue of two facts. One, [NP, S] itself is the most nominal element in any clause, and secondly AGR is in parametric variations, ranging from none at all in languages like Chinese and Japanese to what Taraldsen (1978) called "not rich enough" in languages like English, and to being "rich enough" in languages like Italian and Spanish. This evidently shows that the nominal nature of [NP, S] may or may not be identified with the presence of AGR, though it is only too obvious that AGR should be

nominal if [NP, S] is nominal. But we may ask what other element [NP, S] is identified with when AGR is absent, or indeed whether [NP, S] is identified with any element other than AGR. There is evidence that [NP, S] is identified with INFL irrespective of the presence of AGR. Supposing that: <16>

(23) A nominative [NP, S] is governed by INFL[+N].

we then have the following combinations of [NP/PRO, S] with INFL[±N, ±AGR] drawn from a few languages on a basis of factual instances of clauses:

(24)	In Finite Clauses	In Nonfinite Clauses	Reference
Chinese	[NP [+N, -AGR]]	[PRO [-N, -AGR]]	this thesis
Vata & Gbadi	[NP [+N, -AGR]]	[PRO [-N, -AGR]]	Koopman, 1984
Portuguese	[NP [+N, +AGR]]	[PRO [-N, -AGR]]	
		[NP [+N, +AGR]]	Rouveret, 1980
		(some infinitives)	
Italian	[NP [+N, +AGR]]	[PRO [-N, -AGR]]	
		[NP [+N, -AGR]]	Rizzi, 1982
		(some infinitives)	
Turkish	[NP [+N, +AGR]]	[PRO [-N, -AGR]]	
		[NP(gen.) [-N, +AGR]]	George and
		(some gerund clauses)	Kornfilt, 1980
English	[NP [+N, +AGR]]	[PRO [-N, -AGR]]	
		[NP(gen.) [-N, -AGR]]	Chomsky, 1986b
		(gerund clauses)	

Based on (24), there are several reasons for adopting INFL[+N] rather than INFL[+AGR] as the governor of [NP, S]. Firstly, as far as finite clauses are concerned, INFL[+AGR] does not cover languages without AGR, whereas INFL[+N] covers all languages, with or without AGR. Besides, AGR is inherent to INFL (Chomsky, 1986a-b), so that where there is AGR which is nominal, INFL[+N] is legitimately taken as the governor of [NP(nominative), S]. But the core case should be where there is no AGR, and it is in these cases that taking INFL[+N] as the governor of

[NP(nominative), S] proves to be consistent with cases where AGR is present. Secondly, within the range of nonfinite clauses, although both INFL[-N] and INFL[-AGR] may cover the case of [PRO, S], INFL[-AGR] fails to account for a number of cases which fall within the grasp of INFL[-N]. For instance, Portuguese infinitives may take a [NP(nominative), S] and inflect in agreement with it; although one might argue that it is AGR in this case that governs [NP, S] (cf. Chomsky, 1986b:52), the argument collapses when meeting the case of one type of Italian infinitival clause, and that of Turkish gerund clauses. In the former case, AGR is absent, but there is a [NP(nominative), S]; in the latter case, though AGR is present, the [NP, S] is not nominative but genitive. Both cases are adequately accounted for if INFL[+N], but not INFL[+AGR], is taken as the governor of [NP(nominative), S], as shown in (24). Furthermore, English gerund clauses may have an [NP(genitive), S] without the presence of AGR. This complements the Turkish case that AGR may have nothing to do with [NP(genitive), S] either.

I must add that (24) primarily concerns the government of [NP, S]. Whether INFL[+N] also assigns nominative Case to [NP, S] is a separate issue. As far as Chinese is concerned, I assume that INFL[+N] also assigns nominative Case to [NP, S]. In other cases, for example, in English, we may be able to shift the original assumption that AGR governs as well as Case-marks [NP, S] to one in which INFL[+N] does both jobs. In Vata and Gbadi, we know that a main or auxiliary verb has to be in INFL in order to Case-mark [NP, S] (Koopman, 1984, chap. 5), and that in Italian, an auxiliary verb may move into COMP to assign nominative Case to [NP, S] (Rizzi, 1982). Whatever parametric variations there may be, I believe that the INFL[±N] solution is a solid one for Chinese, and is consistent with two further facts.

The first fact is to do with the so-called pro-drop parameter, which claims that AGR in pro-drop languages licenses (= governs and identifies) [pro, S] and may serve as a proper governor (Jaeggli, 1982; Picallo, 1984; Huang, 1984; van Riemsdijk and Williams, 1985). This parameter accounts for a cluster of properties attested in pro-drop languages, such as being able to have [pro, S] and exhibit no *that-t* effect (see next section). In contrast, non-pro-drop languages do not have such properties and AGR in these languages is believed not to be a proper governor (Kayne, 1980a). Although Rizzi (1982) and Borer (1984a) argued that AGR in Italian and in Modern Hebrew, which display pro-drop phenomena (Perlmutter, 1971), might not be a proper governor, the fact that AGR in these languages licenses [pro, S] remains intact. Now, consider Chinese which is a pro-drop language (examples are given in 2.2.3) and in which there is no AGR. Here, we should first separate the function of AGR governing [pro, S] from that of its identifying [pro, S]. The notion of 'identifying' is in turn based on a general assumption that the existence of a non-overt category is only possible if it is identifiable with an existing overt category. This is the basis for the 'recoverability condition' (Chomsky and Lasnik, 1977), which in essence says that an empty category has to be identified with an overt one if it is recoverable (= reinstated by an overt category). This accounts for a variety of phenomena ranging from coordination deletion to trace theory. As far as pro-drop is concerned, we know that [pro, S] is lexically replaceable by a NP (see 2.2.3). Thus, [pro, S] is recoverable and it has to be identified with an existing category. In a language like Italian, AGR governs [pro, S] just as it governs [NP, S]; at the same time it identifies [pro, S] by virtue of its rich morpho-syntactic realizations (Taraldsen, 1978; Chomsky, 1986b; Huang, 1984).

In Chinese, [pro, S] is identified with a NP either in a superordinate clause or in the context (see 2.2.3 & 2.4.3), because, understandably, there is no AGR. As for the government of [pro, S], with which we are primarily concerned at the moment, [pro, S] has to be governed by INFL, because, again, AGR is absent. This INFL is, presumably, nominal, because [pro, S] is in direct contrast to [PRO, S], i.e. while the former is lexically replaceable, the latter is not (see 2.2.3). Thus, the assumption that INFL[+N] governs and Case-marks [pro, S] and that [PRO, S] is under INFL[-N] fits very well in the case of pro-drop. Indeed, Rizzi (1982) held the view that INFL in Italian must be nominal since it contains an AGR rich enough to license [pro, S]. To this, we may add that when [pro, S] occurs in a language like Chinese in which there is no AGR at all, [pro, S] should be licensed equally by nominal elements, which in the case of Chinese are INFL[+N] and a NP. In other words, while [pro, S] may be licensed by a single nominal element in the Italian type of languages, it is licensed by two such elements in the Chinese type of languages. The reason for this is obvious in the light of our argument. Namely, a rich AGR as the identifier of [pro, S] is inherent to INFL which contains it; so, it appears that AGR both governs and identifies [pro, S], as in Italian. In Chinese where there is no AGR, the identifier of [pro, S] is a NP, which serves as the antecedent of [pro, S] (NB: in this sense, AGR also counts as the antecedent of [pro, S]. Cf. Taraldsen, 1978; Chomsky, 1986b; Huang, 1984), but the government of [pro, S] still rests on INFL. If an AGR is not rich enough, as in English, it cannot identify [pro, S], and perhaps prevents [pro, S] from being identified with another antecedent. So, English has no pro-drop, though AGR governs [NP, S] through INFL.

The second fact is related to one of the most intriguing topics in



(26) thus gives us a reason for believing that the marking INFL[±N] is sound.

To sum up, I have argued that INFL in Chinese is nominal in finite clauses and non-nominal in nonfinite clauses. This proposition seems not only feasible in terms of governing and Case-marking nominative [NP, S], but also possible in the licensing of [pro, S] and in determining finite and nonfinite clauses in Chinese.

### 2.2.2 The ECP

As demonstrated in (9) of 1.1 with English examples, the ECP focuses on trace government in [NP, S] position. When the so-called *that-t* effect (Chomsky and Lasnik, 1977) occurs, the ECP is violated because the trace in [NP, S] position fails to be governed by a co-indexed trace in COMP.

In Chinese, ECP violations have been investigated with abstract wh-movement in LF and NP-movement in Syntax, with the results being controversial. To see what the problems are, let us view them in the following two sub-sections.

#### 2.2.2.1 Wh-movement in LF

Consider the following Chinese sentences (cf. Huang, 1982b; Aoun, 1984:19, 1986:12):

(27)a. zhejian shi [<sub>s</sub> gen [<sub>s</sub> shei lai]] zui you guanxi?

this matter with who come most have relation

- With whose coming does the issue matter the most?

- b. zhejian shi [<sub>S</sub> gen [<sub>S</sub> ni xihuan shei]] zui you guanxi?  
 this matter with you like who most have relation  
 - \*With your liking whom does the issue matter the most?

Unlike the English data of the same nature in (9) of 1.1, the Chinese sentences in (27) do not exhibit subject-object asymmetry in grammaticality regarding wh-extractions, which in fact do not occur in (27).

However, as wh-items are assumed to be raised to COMP in LF (see 1.1), the abstract wh-extractions in (27) in LF are assumed to be as follows (irrelevant details omitted) (cf. Huang, 1982b; Aoun, 1984:19, 1986:13):

- (28)a. [[<sub>COMP</sub> shei<sub>i</sub>] [<sub>S</sub> ... [<sub>S</sub> t<sub>i</sub> gen [<sub>S</sub> t<sub>i</sub> lai]] ...]]  
 who with come  
 "who is the person x such that the issue matters the most with x's coming?"
- b. [[<sub>COMP</sub> shei<sub>i</sub>] [<sub>S</sub> ... [<sub>S</sub> gen [<sub>S</sub> ni xihuan t<sub>i</sub>] ]]] ...]]  
 who with you like  
 "who is the person x such that the issue matters the most with your liking x?"

As we see, (28a) shows a *that-t* configuration, which should result in a violation of the ECP (see 4.4.1.1 for the mechanism of this violation).

However, given that (27a), from which (28a) is derived, is grammatical, there is no reason to consider (28a) to be ill-formed. That is, (28a) is grammatical and does not violate the ECP. The question then becomes how we should account for the *that-t* configuration without the *that-t* effect in (28a).

Huang's (1982a) solution is to postulate that INFL in Chinese acts as a proper governor, so that the trace in (28a) is properly governed by

INFL within the embedded clause, and there is no violation of the ECP. This solution falls nicely within the pro-drop parameter (see 2.2.1).

But Aoun (1984, 1986) argues that Huang's (1982b) solution in fact overlooked a prominent phenomenon in Chinese - the absence of the nominative island condition (NIC), i.e. Chinese allows anaphoric subjects. The alternative solution to (28a) provided by Aoun (1984, 1986) is that the wh-trace should be treated as an empty anaphor, which is no longer subject to the ECP but to Condition A. In (28a), the trace is bound by its antecedent in the COMP of the matrix clause, so that no violation occurs, and (28a) is well-formed. In my view, this solution is a very neat one. (See 2.4.2 for detailed discussions of Aoun's approach.)

The fundamental difference between Huang (1982b) and Aoun (1984, 1986) is that the former considers the *that-t* effect to be effectively, though rather incidentally, suppressed by INFL in Chinese, and the latter sees it as being suspended in general in the language. The basis on which Aoun's (1984, 1986) theory is built is that due to the absence of the NIC in Chinese, anaphors, including wh-traces, are allowed in [NP, S] position, so that as long as they are bound, there will be no ill-formed effect even if they are in a *that-t* configuration.

I am in favour of Aoun's (1984, 1986) view that the *that-t* effect is suspended in Chinese, and that as a result, the ECP is irrelevant in the language. But I consider that Aoun's (1984, 1986) theory should be tested further with a much wider range of Chinese data than was appropriate in Aoun (1984, 1986) (in fact Aoun (1984, 1986) extracted very limited Chinese data from Huang (1982b) and A. Li (1985) and used them mainly on an illustrative basis). I shall return to Aoun's (1984, 1985) and other works of his later in 2.4.2, and apply his theory in the

remaining chapters.

#### 2.2.2.2 An Alleged Case of Raising

Having presented the essence of the issue of the ECP in Chinese in 2.2.2.1, we may now proceed to an alleged ECP violation in NP-movement. I shall show that previous investigations of this case did not produce valid results, because the data concerned were in fact mistaken for those displaying NP-movement.

In GB, NP-movement out of [NP, S] position (into a superordinate clause) is called raising. An English example of raising is in:

(29)a. np is likely [<sub>s</sub>.[John to run away]]

b. John<sub>i</sub> is likely [ t<sub>i</sub> to run away]

In (29), the subject of the infinitival clause *John* cannot get Case because this clause does not contain AGR governing and Case-marking subject position. Thus, *John* is raised for Case to subject position of the matrix clause, and its trace is properly governed by the matrix verb through a process of S'-deletion (Chomsky, 1986b:173), satisfying the ECP. S'-deletion in English is argued to be associated with the so-called raising predicates, such as *to be likely* in (29). By contrast, *to be probable*, for example, is not such a predicate. Moreover, S'-deletion is only possible if the COMP in the S' to be deleted is null, as in (29)

In Chinese, a raising case has been argued for on the basis of the type of data represented in (30) (cf. Tang, 1977; Mei, 1978; Huang, 1982b, 1988; C-R Huang and Mangione, 1985):

(30) ta ba wo<sub>i</sub> ma [<sub>s</sub> de [ t<sub>i</sub> hao shangxin]]

3sg ob.m me scold Comp very sad

- S/He scolded me until I was very sad.

in which the NP 'wo' (I/me) seems to be raised from subject position of the embedded clause to object position of the preposition BA (object-marker) in the matrix clause. The embedded clause is called 'subordinative clause' by Chao (1968:326) <5>.

Just as it is for (29) in English, the reason for raising in (30) in Chinese must also be for Case in terms of GB. Why subject position of the subordinative clause has no Case is the issue which we shall discuss as we proceed. But let us first consider the trace government in (30).

Given that (30) is grammatical, under the ECP, the trace must have been properly governed. However, because of the item 'De' in COMP, S'-deletion is impossible, preventing the trace from being properly governed by the verb of the matrix clause.\*The question arises as to how the trace is properly governed.

Huang (1982b) again argues that INFL in Chinese acts as a proper governor, so that the trace in (30) is properly governed by INFL, and the ECP is not violated.

But, unlike abstract movement in LF such as we have seen in (28), Huang's (1982b) approach toward the syntactic NP-movement in (30) raises a serious discrepancy. The *that-t* configuration in (30) resulting from syntactic NP-movement should be barred, because S-structure is mapped to PF (phonetic forms) as well as to LF. This is the essence of the *that-t* effect at S-structure, and is subsumed in the so-called empty subject filter, which requires a lexical complementiser to be followed by a lexical subject (Chomsky and Lasnik, 1977). In cases where a

lexical subject has to move, either for Case or to act as an operator, then it must take a null complementiser, so that there will be no *that-t* effect and the ECP will be satisfied (through S'-deletion if necessary). The English examples in (9) of 1.1 and in (29) of this section have demonstrated this point.

In (30), the subject of the embedded clause is raised for Case. Thus, in theory, the item 'De' should not occur in COMP of the embedded clause if raising takes place. As it is, (30) poses a violation of the empty subject filter. But, as (30) is grammatical, there is only one possibility: there is neither raising nor the occurrence of 'De' in COMP, because, even if there is no raising, the fact that (30) has still got an empty subject in the embedded clause in which 'De' occurs as a complementiser continues to violate the empty subject filter.

Nevertheless, one might ask whether raising is possible for (30) if 'De' is not in COMP so that the empty subject filter would not apply, and indeed, if so, S'-deletion could apply in order that the trace in subject position of the embedded clause can be properly governed by the matrix verb, as we see in (29). But the answer is still no, because 'De' appears to be a barrier to government. To demonstrate this, let us assume that if 'De' is not in COMP of the embedded clause in (30), then it must be attached to the matrix verb (see 8.2). Consider:

- (31)a. Ta ku mama.  
           V  NP  
           3sg cry mother  
           - S/He cried for Mother.
- b. \*Ta ku-de mama.  
           V  De  NP  
           3sg cry-De mother

c. Ta ku-de si mama.  
 V De V NP  
 3sg cry-De die mother

- S/He may cry to cause Mother to die.

d. ta ku-de mama [hen shangxin]  
 V De NP VP  
 3sg cry-De mother very sad

- S/He cried until Mother was very sad.

(31) shows that intervention of 'De' between a verb and its object results in ungrammaticality (31b), unless there is another verb preceding the object (31c), or the object is followed by a VP (31d). In GB, the ungrammaticality can be accounted for on the basis that 'De' prevents the verb from Case-marking its object, due to cessation of government from the verb to its object. This situation can be saved by an additional verb or VP (see 8.2).

This means that, returning to (30), even if 'De' is not in COMP of the embedded clause and S'-deletion may apply, raising is still not feasible because the trace cannot be properly governed by the matrix verb due to the fact that 'De' is a barrier to government.

But, following Huang (1982b), one might still say that the trace may be properly governed by INFL of the embedded clause:

(32) ta ba wo<sub>i</sub> ma-de [<sub>s</sub>[ t<sub>i</sub> INFL hao shangxin]] (cf. 30)  
 BA NP  
 3sg ob.m me scold-De very sad

- S/He scolded me until I was very sad.

(32) appears to be immune to the problems we have discussed so far, i.e. it does not violate the empty subject filter, nor does it need S'-deletion with INFL to be a proper governor of the trace.

Yet, we have not come to a major issue for raising, the issue of Case. If raising is true of (30/32), the subject of the embedded clause is raised for Case. This is to say that (30/32) are derived from a

structure in which the subject concerned has no Case, such as we see in (29) in English. The structure in question is said to be (33) below (cf. Tang, 1977; Mei, 1978; Huang, 1982b, 1988; C-R Huang and Mangione, 1985):

(33) ta ma [de [wo hao shangxin]] (cf. 30/32)

NP  
3sg scold Comp I very sad

- S/He scolded me until I was very sad.

(33), however, is grammatical on its own, indicating that the subject of the embedded clause apparently has Case, so that it does not have to move, suggesting that there is no motivation for raising from (33) to (30/32).

In addition, BA in (30/32) is generally taken as being inserted at S-structure to assign Case to an existing NP at D-structure (Koopman, 1984; Travis, 1984; Williams, 1984b; Sells, 1985; A. Li, 1985; also see 2.3.2.1 and 3.2). Since the marked NP in (33) is Case-marked in its position, there is no reason for BA-insertion or raising the NP to the object position of BA.

Given all the above evidence, we may conclude that (30/32) should not be treated as a case of raising. Consequently, there is no EDP violation in (30/32).

As for questions such as what the empty subject will be in (30/32) given that there is no raising, and how we should analyse this type of data, I shall return to these in chapter 8.

### 2.2.3 PRO and pro Positions

In 1.1, control theory stipulates that PRO occurs in a position where a pronominal is required but where it is ungoverned and Caseless.

So, lexical NPs are barred from PRO positions. In a language like English, as nonfinite clauses cannot take lexical subjects, the subject position of these clauses is therefore motivated for PRO, as we have seen in (26) of 1.1. In Chinese, which neither manifests tense nor has any overt marking for nonfinite clauses (see 2.2.1), the issue of how to determine a PRO position is largely an empirical one. However, as Chinese allows pro-drop, there are two types of empty subject in the language: [PRO, S] and [pro, S].

pro differs from PRO in that it is governed and Case-marked (see 2.2.1). In other words, [pro, S] can be replaced by a [NP, S]. Consider the sentences below, in which the [NP, S] in parentheses is optional:

(34)a. Ruguo ta sheng bing, (ta) jiu bie qu le.

if 3sg fall ill (3sg) thus not go p.

- If s/he is ill, s/he shouldn't go.

b. Yinwei (ta) mang, ta mei lai.

because (3sg) busy 3sg not come

- Because s/he was busy, s/he didn't come.

c. Suiran ta nianji da, (ta) haishi nuli gongzuo.

though 3sg age old (3sg) still hard work

- Though s/he is old, s/he works hard.

d. Chufei (ta) yuanyi, ta bu hui lai.

unless (3sg) willing 3sg not will come

- S/He won't come unless s/he is willing to do so.

e. Wanyi wo jintian mei qu, (wo) mingtian yiding qu.

in-case I today not go (I) tomorrow surely go

- In case I don't go today, I will certainly go tomorrow.

(35)a. (Ta) lai-le.

(3sg) come asp

- S/He has come.

b. (Ta) mai de shu hen duo.

(3sg) buy Comp book very many

- The books s/he bought are very many.

The [NP, S] in parentheses in (34-35) is thus identified as [pro, S]. We also observe from (34-35) that a [pro, S] must be semantically identified by an NP in the context, i.e. an NP outside the clause in which [pro, S] occurs. In (34), [pro, S] is identified by the [NP, S] of another clause which is discoursally related to its own; in (35), though the NP for identifying [pro, S] is not provided, it is apparent that [pro, S] is coreferential with an NP in the context in which these sentences are used.

If we define the distribution of [pro, S] in (34-35) as being in independent clauses, now consider [pro, S] in an embedded clause:

(36)a. Zhangsan<sub>i</sub> shuo [ pro<sub>i</sub> mingtian lai] <6>

... say tomorrow come

- Zhangsan said that he would come tomorrow.

(Zhangsan and pro must be in coreference.)

b. Zhangsan<sub>i</sub> shuo [ ta<sub>i</sub> mingtian lai]

... say 3sg tomorrow come

- Zhangsan said that he would come tomorrow.

(Zhangsan and 'ta' (he) may or may not be in coreference.)

First of all, [pro, S] in (36a) is determined by virtue of the fact that it is lexically replaceable by [NP, S] in (36b). But a Switch Reference phenomenon (Jacobsen, 1967) is observed between (36a) and (36b). Unlike [pro, S] in independent clauses in (34-35), in which [pro, S] does not

"switch" its reference if replaced by [NP, S], [pro, S] in an embedded clause in (36) may do so when reinstated by [NP, S]. The principles behind this phenomenon are: a) the so-called "minimal distance" or "the closest co-indexing" rule (Rosenbaum, 1967; Chomsky, 1980, 1986b; Huang, 1984), and b) the Avoid Pronoun Principle (Chomsky, 1986b) (cf. 1.1). These principles apply to both pro and PRO. In the case of [pro, S] in (36a), pro has to be identified by the [NP, S] of the matrix clause, as this NP is the closest to pro. Here, the notion of "closest" is defined in terms of c-commanding. Thus, in general, a pro in an embedded clause has to be identified by a NP in a superordinate clause, as Huang (1984) points out. As for (36b), a pronominal may or may not be identified by an antecedent; therefore, if the coreference between [pro, S] and the [NP, S] in the matrix clause is to be maintained, the pronominal should not be used, as predicted by the Avoid Pronoun Principle.

Returning to [pro, S] in independent clauses in (34-35) where there is no Switch Reference phenomenon, [pro, S] here involves neither the notion of "the closest co-indexing" nor the Avoid Pronoun Principle. The reference of [pro, S] is determined by a NP in the context. However, there is one thing in common between [pro, S] in independent clauses and [pro, S] in an embedded clause, i.e. they are both identified by a NP outside the clause in which they occur (further see 2.4.3).

It is worth noting that an anaphor can occur in the [pro, S] position in (36a) and has the same reference as [pro, S] does:

(37) Zhangsan shuo [ziji mingtian lai] (cf. 36a)

... say self tomorrow come

- Zhangsan said that he would come tomorrow.

(Zhangsan and 'ziji' (self) are in coreference.)

Given (36a), (37) shows that [pro, S] of an embedded clause behaves like

anaphors in the same position, namely, both must be identified by a NP in a superordinate clause. This parallel way of seeking reference by [pro, S] as well as anaphoric subjects is hardly surprising in Chinese where there is no AGR. As stated in 2.2.1, AGR identifies [pro, S] in a language like Italian. But in Chinese, which lacks AGR, [pro, S] has to be identified by a NP outside the clause in which [pro, S] occurs. This happens to be the same way in which anaphoric subjects are identified, for anaphors in general have to have an antecedent. The only difference between [pro, S] and [NP(+anaphoric), S] of an embedded clause is that the former is free and the latter has to be bound. I shall return to this issue in 2.4.1.1.

Having observed [pro, S] in Chinese which is characterised by being able to be lexically reinstated and semantically identified by a NP outside the clause in which it occurs, let us move on to the other category of empty subjects, [PRO, S]. Consider the empty subject in the following, written as *e* for the time being:

(38)a. wo qing ta<sub>i</sub> [ e<sub>i</sub> chi fan]

I invite 3sg eat meal

- I invite her/him to have a meal.

b. \*Wo qing ta<sub>i</sub> [ta<sub>i</sub> chi fan]

I invite 3sg 3sg eat meal

(39)a. ta<sub>i</sub> da dianhua [ e<sub>i</sub> jiao chuzuche]

3sg make telephone-call call taxi

- S/He telephoned to call a taxi.

b. \*ta<sub>i</sub> da dianhua [ta<sub>i</sub> jiao chuzuche]

3sg make telephone-call 3sg call taxi

(40)a. ta<sub>i</sub> zuo che [ e<sub>i</sub> hui jia]  
3sg sit bus return home  
- S/He goes home by bus.

b. \*ta<sub>i</sub> zuo che [ta<sub>i</sub> hui jia]  
3sg sit bus 3sg return home

(41)a. Lisi<sub>i</sub> xihuan [ e<sub>i</sub> kan shu]  
... like read book  
- Lisi likes to read.

b. \*Lisi<sub>i</sub> xihuan [ta<sub>i</sub> kan shu]  
... like 3sg read book

(42)a. Zhangsan<sub>i</sub> zhege ren hen nan [ e<sub>i</sub> gen ta<sub>i</sub> shuo hua]  
... this person very difficult with 3sg talk  
- This person, Zhangsan, is very difficult to talk to.

b. \*Zhangsan<sub>i</sub> zhege ren hen nan [ta<sub>i</sub> gen ta<sub>i</sub> shuo hua]  
... this person very difficult 3sg with 3sg talk

The fact that the empty subject in (38-42) is not replaceable by a lexical NP suggests that it is Caseless and should be ungoverned. Thus, it should be identified with [PRO, S]. [PRO, S] in (38-42) seems to fall into two sub-categories as far as its reference is concerned. As we have seen, while it is identified by a NP outside the clause in which it occurs in (38-41), [PRO, S] in (42) has an independent reference (= someone).

Thus, [PRO, S] differs from [pro, S] in Chinese in that the former is not replaceable by [NP, S] and may or may not be identified by a NP outside the clause in which it occurs. This observation is in agreement with that regarding [PRO, S] in general in Chomsky (1986a-b). As for what types of clause in Chinese may contain [PRO, S], this touches on the issue of how to define [PRO, S] in terms of government in Chinese.

As argued in 2.2.1, [PRO, S] occurs in nonfinite clauses in Chinese, which have an INFL[-N] unable to govern or Case-mark [PRO, S]. In contrast, INFL[+N] in finite clauses governs and Case-marks [NP/pro, S]. Note that aspects displayed in Chinese clauses do not differentiate between finite and nonfinite clauses, as [PRO, S] may also occur with an aspect marker, as shown in:

(43)a. wo qing ta, [PRO, INFL[-N] chi-guo fan] (cf. 38a)

I invite 3sg eat asp meal

- I invited her/him to have a meal.

b. ta, da dianhua [PRO, INFL[-N] jiao-le chuzuche] (cf. 39a)

3sg make telephone-call call asp taxi

- S/He telephoned to call a taxi.

Thus, I shall follow the proposition in the rest of this thesis that INFL[-N] marks PRO-clauses.

### 2.3 $\theta$ - and Case-Marking

As stated in 1.1,  $\theta$ - and Case-marking are under directionality (Williams, 1984b; Koopman, 1984; Travis, 1984; Sells, 1985; A. Li, 1985).  $\theta$ -marking, which follows the head-initial/final parameter in X-bar theory, is either to the left or right of the head (cf. (4) of 1.1); Case-marking, however, may or may not follow the head-initial/final parameter, depending on individual languages, as illustrated in (Koopman, 1984:121):<7>

(44) Head-initial: a) X ...  $\theta$  + Case      b) Case ... X ...  $\theta$   


Head-final: c)  $\theta$  + Case ... X      d)  $\theta$  ... X ... Case  


English, for example, in which the objects of verbs and prepositions occur to the right of V or P, is head-initial, and both  $\theta$ - and Case-marking are assumed to be to the right of the head (Chomsky, 1986a-b), i.e. the pattern in (44a).

In Chinese, the objects of verbs and prepositions also occur to the right of V or P, i.e. V/P-NP, as demonstrated elsewhere in this thesis. Should we therefore regard Chinese as being head-initial? The contradictory case seems to be NPs, which are strictly head-final in Chinese, as we see in 2.1.1, where it is demonstrated that adjectival and clausal complements to nouns precede the head rather than follow it. However, as far as  $\theta$ - and Case-marking are concerned, they apply mostly (or only) to NPs. So, to determine whether Chinese is head-initial or head-final, we must first examine cases where nouns take NPs as complement in order to decide whether NPs in Chinese are really head-final. If they are not, which means that NPs are underlyingly head-initial, then we may consider that Chinese is head-initial; but if they are, we have to examine whether VPs and PPs are really head-initial, or whether they are possibly underlyingly head-final.

### 2.3.1 Possessive NPs

In Chinese, NP complements to nouns must be in the possessive form.

E.g.

(45)a. Lisi-de mama

... 's mother

- Lisi's mother

b. \*Lisi-de mama <8>

... mother



In (47), the head  $\theta$ -marks and assigns inherent Case to 'Lisi' (= John) at D-structure (47a), and POSS-insertion occurs at S-structure to realise the Case (47b). There is no equivalent form in Chinese to *the mother of John* in English, as the non- $\theta$ -marking Case assigner, BA (= *of*, in this sense), in Chinese occurs only in VPs (see 2.3.2).

Considering which structure, (46) or (47), is more likely to reflect the state of possessive NPs in Chinese, we should bear in mind that other types of complement to nouns in Chinese, such as APs and appositive clauses, must precede the head (see 2.1.1). If we regard Chinese as being head-initial, it means that APs and appositive clauses, when occurring as complements to nouns, must undergo a transformation to appear before the head in surface form. But there seems to be little evidence for such a transformation.

In the case of possessive NPs, although a transformation is feasible if we take NPs in Chinese as being head-initial because POSS-insertion occurs to the left of the head, it is equally feasible that this transformation does not take place at all, if we take NPs in Chinese as being head-final, as in (47). If we eliminate, in theory, transformations that may or may not occur, it would have the effect that possessive NPs in Chinese are of the structure in (47) rather than that in (46). In fact, this principle is supported by the contrast between Chinese in which complements to nouns other than possessive NPs also precede the head, and English in which most complements to nouns, including possessive NPs, follow the head (cf. Radford, 1981). Therefore, we may conclude that there is no transformation in NPs in Chinese, and they are head-final.

If so, the analysis in (46) for English and that in (47) for Chinese constitute a contrasting case of  $\theta$ - and Case-marking

interaction. In English, which is head-initial, the fact that possessive NPs occur to the left of nouns argues for the feasibility of possessive NP movement in (46). Namely, given that  $\theta$ -marking occurs with the head-initial ordering, but possessive Case is only assigned to the left of the head, the NP-movement follows as the result of  $\theta$ - and Case-marking interaction.

In contrast, possessive NPs in Chinese, which are taken as head-final, need not move in (47), as they occur to the left of nouns. Thus, both  $\theta$ - and (possessive) Case-marking occur to the left of the head.

### 2.3.2 Head Ordering in VPs and PPs

If NPs in Chinese are head-final, it directly contradicts the fact that [NP, VP/PP] in the language occurs to the right of V or P. But it would be extremely unlikely that Chinese has two ways of structural ordering, head-final in NPs, but head-initial in VPs and PPs. If the head-final ordering in NPs is feasible, as I argued in 2.3.1, we then have to consider that VPs and PPs are also head-final, and that there is a transformation in VPs and PPs, i.e. NP-V/P  $\Rightarrow$  V/P-NP.

As stated earlier, transformation is as much a theoretical issue as an empirical one. If a predicted transformation is feasible, there must be solid empirical evidence in support of it. If we take VPs and PPs as being head-final, the crucial issue is whether there is evidence for the predicted transformation NP-V/P  $\Rightarrow$  V/P-NP. Let us examine the case of VPs first.

### 2.3.2.1 VPs

Previously, two facts were used to argue for the transformation NP-V => V-NP in VPs. Firstly, constituents which may be identified as modifiers in VPs almost exclusively occur before the head rather than after it in Chinese. This means that complements and modifiers in VPs are in different orders in relation to the head. E.g.

(48) Wo /zuotian/ /zai shangdian-li/ /gei ta/ mai-le /yiben shu/.  
ADVP PP PP V NP  
I yesterday at shop-in for 3sg buy asp one book

- I bought a book for him in the shop yesterday.

Presumably, the ADVP and two PPs in (48) are modifiers, and the NP a complement. As we see, the former occurs to the left of the head, but the latter to the right. Given this, we have to have categorial rules such as VP -> ADVP/PP V' and V' -> V NP (cf. Huang, 1982b:41). In these rules, V is either left or right in relation to other constituents. Although this may not be a serious problem, as the relative order of modifiers is not restricted in GB, the two ways of head ordering can be easily solved if we take VPs as being head-final. That is, instead of V' -> V NP, a rule V' -> NP V will operate at D-structure, and a transformation NP-V => V-NP will apply at S-structure (Koopman, 1984: 122-125).

Secondly, [NP, VP] in Chinese frequently occurs after the preposition BA, which is semantically inert and functions as the object marker of a verb. E.g.

(49)a. Wo chi-le fan.  
V NP  
I eat asp meal

- I have eaten.

b. Wo ba fan chi-le.  
BA NP V  
I ob.m meal eat asp

- I have eaten.

c. \*Wo fan chi-le.  
NP V  
I meal eat asp

(49a) and (49b) have exactly the same interpretation, but differ from each other in that [NP, VP] in (49a) appears after the verb, but after BA in (49b). And (49c) shows that without BA, [NP, VP] cannot occur before the verb, i.e. \*NP-V.

In terms of GB, BA, being semantically inert and able to take an object, is a non- $\theta$ -marking Case assigner. Given (49), it appears that [NP, VP] gets Case either from the verb or from BA. The question is why the NP should appear after BA in (49b) since it can get Case from the verb in (49a). To be more specific, there is no reason to assume that (49b) is derived from (49a) by NP-movement, since the NP has Case in (49a) so that it does not have to move.

If we take VPs in Chinese as being head-final, then the BA occurrence in (49b) seems to have a principled account on the basis of interactions between  $\theta$ - and Case-marking. That is, given the head-final ordering,  $\theta$ - and Case-marking in Chinese would have to be by the pattern of (44d), i.e.  $\theta$ -marking is to the left of the head because it goes with head-initial/final ordering; but Case-marking is to the right, because in surface form Chinese only allows V-NP but not \*NP-V, as shown in (49a) and (49c).

Thus, for (49a), the NP occurs before the verb at D-structure, and is  $\theta$ -marked; but it occurs after the verb at S-structure by means of transformation - V or NP movement, as illustrated in (50a). The purpose of such movement, it is assumed, is for the NP to get Case,

given that Case is assigned to the right of the verb. As for (49b), the above-assumed movement does not take place; the NP remains before the verb, but BA is inserted before the NP and assigns Case to it, as illustrated in (50b) (cf. Williams, 1984b; Koopman, 1984; Travis, 1984; Sells, 1985; A. Li, 1985; Huang, 1988):

(50)a. [wo fan chi-le] => NP/V movement => [wo chi-le fan]  
           NP    V  V    NP  
           I meal eat-asp                                  I meal eat-asp  
   - I have eaten.

      b. [wo fan chi-le] => BA-insertion => [wo ba fan chi-le]  
           NP    V  BA NP    V  
           I meal eat-asp                                  I ob.m meal eat-asp  
   - I have eaten.

Whether V or NP movement should apply in (50a) will be discussed in the next section, and the mechanism of BA-insertion in (50b) in 3.2.

Apart from the findings in the above from previous research, there are other facts which argue for VPs in Chinese being head-final. One of them is passivisation.

It has long been observed that the so-called notional passives (a term from L. Wang, 1957) exist in Chinese. E.g.

(51)a. Ta zhua-qilai le.  
       NP    V  
       3sg arrest up p.  
       - S/He has been arrested.

      b. Ta fang-chulai le.  
       NP    V  
       3sg release out p.  
       - S/He has been released.

The sentences in (51) entail passive interpretations but do not contain a passive marker. But they may take a passive marker without any change in their interpretations, e.g.

(52)a. Ta /bei/ zhua-qilai le. (cf. 51a)

NP            V  
3sg p.m arrest up p.

- S/He has been arrested.

b. Ta /bei/ fang-chulai le. (cf. 51b)

NP            V  
3sg p.m release out p.

- S/He has been released.

The sentences in (52) with a passive marker are thus called "structural passives" (L. Wang, 1957).

But given the comparison between (51) and (52), it appears that whether or not they contain a passive marker does not decide the passive nature of the so-called notional passives. Or in other words, the existence of such passive sentences in Chinese, and the fact that they optionally take a passive marker, suggest that investigations on passivisation in Chinese must be pinned down to sentences like (51) which do not contain a passive marker, rather than to those like (52) which do <9>.

The question is what determines the passive nature of the notional passives in (51), or how we should account for them.

Consider the active forms of (51) as well as (52) in:

(53)a. (Women) zhua ta qilai le.

          V    NP  
we arrest 3sg up asp

- We have arrested her/him.

b. (Women) fang ta chulai le.

          V    NP  
we release 3sg out asp

- We have released her/him.

And the active forms with the preposition BA in:

(54)a. (Women) ba ta zhua-qilai le.

NP V  
we ob.m 3sg arrest up asp

- We have arrested her/him.

b. (Women) ba ta fang-chulai le.

NP V  
we ob.m 3sg release out asp

- We have released her/him.

The major difference between the passives in (51-52) and the actives in (53-54) is that [NP, VP] appears as [NP, S] in the former, but occurs after the verb or after BA in the latter.

Thus, it seems that it is the fact that [NP, VP] occurs as [NP, S] of a sentence, that determines the passive nature of that sentence, both notional and structural passives alike.

Now, to give an account of the notional passives in (51), we may ask how [NP, VP] becomes [NP, S] in these sentences. To answer this question within GB, we first assume that [NP, VP] is not in [NP, S] position at D-structure, but moves into the latter at S-structure. There are two possible positions from which [NP, VP] may move into [NP, S] position. Firstly, if VPs in Chinese are head-initial, i.e. V-NP, then [NP, VP] moves into [NP, S] position from a postverbal position. But, given that NP-movement is motivated by Case (see 1.1), the fact that the NP in the sequence V-NP in Chinese is well-formed (see (49a) and (53a)), suggests that the NP is assigned Case by the V and does not have to move. In other words, the NP-movement in question is not from a postverbal position.

The second position, naturally, is preverbal. It means that we take VPs as being head-final in Chinese, i.e. NP-V. In this position, the NP gets no Case (i.e. \*NP-V at S-structure; see (49c)), and has to move. When the NP moves into [NP, S] position, we then have the so-called

notional passives in (51), as illustrated in:

(55) [np, S]-NP-V => [NP, S]-Ø-V

One piece of evidence in support of the analysis in (55) may be derived from the following type of data:

(56) Ji chi-le.  
NP V  
chicken eat-asp

- a. - The chicken has eaten.
- b. - The chicken has been eaten.

It is straightforward to posit that the NP in (56) is [NP, S], if the sentence is active. But if the sentence is passive, the NP has to be [NP, VP], and has presumably moved into [np, S] position as illustrated in (55). The ambiguity arises because both the passive sentence and the active sentence share the same surface form: NP-V.

Now, if we put the current and previous findings together (see (55) and (50)), we find that if VPs are head-final, the NP in an underlying sequence NP-V may get Case in three ways: a) by moving into an empty [np, S] position, b) by means of BA-insertion, and c) from the verb through a transformation NP-V => V-NP. The first way yields passive sentences and the next two active sentences.

The next issue to consider is whether the V or the NP is moved in the transformation NP-V => V-NP.

#### 2.3.2.2 V-movement

It has been suggested that NP-movement may apply in the transformation NP-V => V-NP (Koopman, 1984; Sells, 1985), but little evidence

has been given so far for this suggestion. For the reasons that follow, we shall see that V-movement seems more appropriate.

Given an underlying sequence NP-V in which the NP is not Case-marked, we wish to have the results in (57a-b), but not (57c), if the NP moves for Case:

- (57)a. [np, S]-NP-V => [NP, S]-Ø-V (= passive)
- b. [NP, S]-NP-V => [NP, S]-Ø-V-NP (= active)
- c. [np, S]-NP-V => \*[np, S]-Ø-V-NP

(57) suggests that if subject position is empty, i.e. [np, S], the NP of the verb will automatically move into this position, yielding a passive clause <10>, and that if subject position is not empty, i.e. [NP, S], the NP will move to a postverbal position (by adjunction as suggested in Koopman (1984)). The point at issue is what will guarantee the NP-movement into [np, S] position, so that we will have (57a) rather than (57c).

As stated in 1.1, clauses must satisfy the  $\theta$ -Criterion that one A-position must have a  $\theta$ -role and one  $\theta$ -role only. It is a standard assumption that a NP carries its  $\theta$ -role with it when moving into another position. Thus, when a NP from an A-position moves into another A-position, e.g. [NP, VP] moves into [np, S] position,  $\theta$ -marking to the latter must be suspended, so that the moved NP will not end up having two  $\theta$ -roles - a violation of the  $\theta$ -Criterion. The question is of course how  $\theta$ -marking to an A-position receiving a NP that already has a  $\theta$ -role is suspended.

In a language like English, it is argued that the past participle morpheme *en* performs this task when [NP, VP] moves into [np, S]

position (see (18) of 1.1). In Chinese, as we see in the case of notional passives in (51), which (57a) represents, there is no morpho-syntactic marker which we may pin down as doing this job. The only significant fact in these sentences is that [NP, VP] occurs as [NP, S] (cf. (51) vs. (53)). Thus, it appears that if we assume a NP-movement into [np, S] position in these sentences, we then have to consider that this NP-movement also causes suspension of  $\theta$ -marking to [np, S] position.

Because NP-movement is due to lack of Case, we may thus propose the following for Chinese:

- (58) A verb suspends  $\theta$ -marking to [np/NP, S], if it does not Case-mark [NP, VP] and if [NP, VP] moves for Case.

Under (58), when [NP, VP] moves into [np, S] position for Case, the verb will suspend its  $\theta$ -marking to [np, S] position, so that the outcome of the NP-movement, [NP, S]- $\emptyset$ -V, does not violate the  $\theta$ -Criterion.

Note that (58) is by no means a random proposition, but has significant consequences in Chinese. First of all, it produces the desired effect on the output of NP-movement from an underlying sequence [np, S]-NP-V. Under (58), once the NP moves, the verb will suspend its  $\theta$ -marking to [np, S] position; unless this NP moves into [np, S] position, this position will be left without a  $\theta$ -role, violating the  $\theta$ -Criterion in that an A-position must have a  $\theta$ -role. This is to say that (58) provides just the guarantee under which NP-movement out of [np, S]-NP-V will yield (57a), but not (57c).

Secondly, when we have BA sentences in the form of [NP, S]-BA-NP-V (49b and 54), BA assigns Case to the NP (cf. (50)). Thus, although the verb does not Case-mark the NP, the NP does not move for Case either.

Under (58), [NP, S] in [NP, S]-BA-NP-V remains  $\theta$ -marked, and the  $\theta$ -Criterion is satisfied.

Thirdly, under (58), V-movement instead of NP-movement is necessary for an underlying sequence [NP, S]-NP-V, because if the NP moves,  $\theta$ -marking to [NP, S] will be suspended, violating the  $\theta$ -Criterion. So, after modifying (57b), we have:

(59) [NP, S]-NP-V => [NP, S]-V-NP- $\emptyset$

The V-movement in (59) is presumably by sister-adjunction, as illustrated in: <17>



In cases where verbs take a clausal complement, we may assume that the head-initial head ordering also applies, though a clausal complement does not need Case.



However, for simplicity of presentation, structural representations (trees and brackets) that follow in this thesis may not show the trace in (60-61).

### 2.3.2.3 Ditransitives

Let us examine one case of Chinese ditransitives in the light of VPs in the language being head-final. Consider the following:

(62)a. ta huan [wo] [qian]  
V NP1 NP2  
3sg return me money

- S/He returns me money.

b. \*ta huan [qian] [wo]  
V NP2 NP1  
3sg return money me

c. ta huan [qian] [gei wo]  
V NP2 P NP1  
3sg return money to me

- S/He returns money to me.

d. ta ba [qian] huan [gei wo]  
BA NP2 V P NP1  
3sg ob.m money return to me

- S/He returns money to me.

e. \*ta [gei wo] huan [qian] <11>  
P NP1 V NP2  
3sg to me return money

In (62), the verb takes two NPs as complement, marked as NP1-NP2. NP1 is the indirect object, and NP2 the direct object. NP1 always precedes NP2 (62a-b), unless NP1 appears after the preposition GEI (dative) which follows NP2 (62c), or NP2 appears after BA before the verb (62d). Also note that in (62a-d), NP1 retains the same argument with respect to the verb. We may call this argument "the Goal" (cf. Jackendoff, 1972). (62e) shows that NP1 (the Goal) with its preposition GEI (dative) are not allowed preverbally (see footnote <11> for further discussion).

Given that VPs in Chinese are head-final, we would expect that, for (62a), the constituent ordering in the VP at D-structure is:

(63) NP1-NP2-V

which in comparison with NP2-NP1-V seems more desirable in that (63) is in agreement with cases like (62c) where the indirect object NP1 occurs

in a PP. That is, for (62c) at D-structure, we will have:

(64) PP-NP2-V, where PP = [NP1 P(dative)]

which is more feasible than NP2-PP-V, because NP2 (= direct object) is adjacent to the verb.

In GB, NP2 in (63) is assigned inherent Case and NP1 should receive structural Case from the verb (see 1.1). But NP1 in (63) cannot receive Case from the verb because Case is assigned to the right of the head in Chinese. Thus, the question is whether NP1 should move rightwards to acquire Case, or the verb should move leftwards to achieve the same result. There is a technical issue that needs to be resolved. When we say "the verb moving leftwards", we mean that the verb moves leftwards across both NP2 and NP1, not just across NP2; if it were to move just across NP2, the result would be the same as if NP1 had moved rightwards, that is:

(65) \*ta [qian] huan [wo]  
      NP2 V NP1  
      3sg money return me

As we see, movement of NP1 to the position after the verb is barred.

But before we consider the proposed V-movement, we should study the ungrammaticality of (65) first. In (65), NP1 can receive Case from the verb, because structural Case is assigned so long as the relevant context is right (see 1.1). So, the ungrammaticality is caused by something else. There is only one factor for this, i.e. the inherent Case assigned to NP2 has not yet been realised. Recall that genitive Case-realisation is by insertion of a non- $\theta$ -marking Case-assigner (cf. 1.1). This in Chinese is POSS-insertion (cf. 2.3.1), and either POSS- or *of*-insertion in English (cf. 1.1). But little has been said so far in

the literature about objective Case-realisation, such as in the case of (63) which we are dealing with now. In Chomsky (1986a:194), it is only said that inherent Case must be realised on NP at S-structure under government by the head that  $\theta$ -marks NP at D-structure. As we see in 2.3.1, genitive Case is realised via the POSS-marker to NP on the left of the marker, e.g. both in English and in Chinese (*of*-insertion in English should be regarded as a special case). But, objective Case in both languages is assigned uniformly to the right, as by verbs and prepositions. Thus, my interpretation of Chomsky's (1986a) notion of Case-realisation with respect to objective Case is that (inherent) objective Case should be realised at S-structure with respect to the direction in which this Case is assigned in individual languages. This view immediately accounts, for example, for a case of ditransitives in English such as:

(66) John gave [Bill] [a book]  
       V      NP1   NP2

in which NP2 is said to be assigned inherent Case and NP1 structural Case (Chomsky, 1986b:171). But, to implement Chomsky's (1986a) notion of Case-realisation in (66), we have to assume that inherent Case to NP2 is realised along with structural Case-assignment to NP1 at S-structure. This implementation is opaque in (66) because inherent Case-assignment and its realisation happen to be in the same direction.

But, returning to the case of (65) in Chinese, we find a different as well as contrasting situation. NP2 in (65) is assigned inherent Case, which occurs with  $\theta$ -marking to the left of the head, given that Chinese is head-final. In our current view, inherent Case to NP2 has to be realised at S-structure along with (structural) Case-assignment which is to the right of the verb. In (65), this has not yet happened, hence the

ungrammaticality. More importantly, this view offers an account for the data of a vital nature in:

(67) \*ta ba [qian] huan [wo]  
BA NP2 V NP1  
3sg ob.m money return me

The preposition BA (= an objective Case-assigner in GB terms) has been inserted into (65), resulting in (67). But (67) is still ill-formed, suggesting that the ungrammaticality of (65) is not caused by NP2's lacking Case, but presumably by its Case-realisation, which has to be in the same direction as (structural) Case-assignment, i.e. to the right of the verb. Thus, (67) serves as a piece of crucial evidence for our current view on Case-realisation. (A seeming counterexample to (67) will be discussed later.)

Given that moving NP1 in (63) rightwards did not yield well-formed sentences (cf. (65)), the alternative is that the verb in (63) moves leftwards to assign Case to NP1, i.e.

(68) NP1-NP2-V => V-NP1-NP2-Ø

The outcome of the derivation in (68) is exactly the surface form of (62a). Besides, the well-formedness of (62a) as the output of (68), in contrast to (65) and to (67), provides yet another piece of evidence for our view on Case-realisation, namely, that inherent (objective) Case assigned to NP is only realised when NP occurs in a position which respects structural (objective) Case-assignment.

Given (68), it also seems that V-movement instead of NP-movement should apply in ditransitives in Chinese for Case-assignment. This result is consistent with that in (59) derived from mono-transitive verbs.

Now, let us consider (64), the constituent ordering for (62c) at D-structure. Because the (dative) PP must occur postverbally in (62c) (see (62e)), we expect that (64) should undergo certain transformations. Two of these are presumably:

- (69)a. [NP1 P(dative)]-NP2-V => Ø-NP2-V-[NP1 P(dative)]  
 b. NP-P => P-NP-Ø

(69b) presumes that PPs in Chinese are also head-final at D-structure, an issue to which I shall return in the next section.

However, the results produced by (69) are not yet correct, e.g.

- (70) \*ta [qian] huan [gei wo] (cf. 62c)  
           NP2  V      P  NP1  
       3sg money return to me

(70) does not involve inherent Case-assignment (see Chomsky (1986b:171) for a similar case in English). So, presumably, its ungrammaticality is due to NP2's lacking (structural) Case. There are two ways of resolving this: a) BA-insertion as demonstrated in (50), or b) by moving the verb, so that it precedes NP2. As a result, we have:

- (71)a. Ø-NP2-V-[P NP1] => BA-insertion => BA-NP2-V-[P NP1]  
 b. Ø-NP2-V-[P NP1] => V-NP2-Ø-[P NP1]

The output of (71a) is then (62d), and that of (71b), (62c). Thus, we have feasibly deduced all the possible derivations which yield correct surface forms in (62) exemplifying Chinese ditransitives.

One might still ask, though, whether it is possible to move NP2 in (70), instead of the verb, as in:

(72)  $\emptyset$ -NP2-V-[P NP1]  $\Rightarrow$   $\emptyset$ - $\emptyset$ -V-NP2-[P NP1]

Unfortunately, neither the NP-movement in (72) nor the V-movement in (71b) is directly testable. But, as we have argued in 2.3.2.2, NP-movement should cause suspension of  $\theta$ -marking to [NP, S] position (see (58)). This proposition has some most significant consequences in passivisation in Chinese, and should be pursued systematically in analysing this language. Thus, I consider that (72) is barred.

Finally, we return to the data in (67) showing that BA-insertion into a string \*NP2-V-NP1 yields no well-formed result, i.e. \*BA-NP2-V-NP1. However, there is one seeming counterexample to this:

(73) ta ba qian gei wo (cf. 67)  
BA NP2 V NP1  
3sg ob.m money give me  
- S/He gave me money.

The verb in (73) is 'gei' (to give), which is the only ditransitive verb in Chinese which allows the surface form BA-NP2-V-NP1. Why? Or does the existence of (73) oppose our proposition that inherent Case-realisation is in the same direction as Case-assignment in Chinese (or in any other language)? The answer is No. In fact, unlike (67), (73) does not involve inherent Case assignment or realisation, but rather is a special case of those ditransitives which take a postverbal dative PP (= P-NP1).

As has been demonstrated in the above, ditransitives taking a postverbal dative PP have the following constituent ordering at D-structure:

(74) [NP1 P(dative)]-NP2-V

Then, the PP, after the transformation NP-P  $\Rightarrow$  P-NP (cf. (69b)), moves rightwards to produce:

(75)  $\emptyset$ -NP2-V-[P(dative) NP1]

And then V-movement or BA-insertion apply:

(76)a. V-NP2- $\emptyset$ -[P(dative) NP1] (cf. 62c)

b. BA-NP2-V-[P(dative) NP1] (cf. 62d)

Now, consider further data related to the verb 'gei' (to give):

(77)a. ta gei qian [gei wo] (cf. 76a)

V NP2 P NP1  
3sg give money to me

- S/He gave money to me.

b. \*ta ba qian gei [gei wo] (cf. 76b and 73)

BA NP2 V P NP1  
3sg ob.m money give to me

The sentence in (77a) shows that the verb 'gei' (to give) takes a postverbal dative PP, so that it belongs to the category of verbs that undergo the derivational processes listed in (74-76). But why does the derivation yield (73) rather than (77b)? The reason is, as we see in (77b), that the verb 'gei' (to give) has the same phonetic form as the preposition (dative) 'gei' (to). It has been suggested that 'gei' (to) in (77b) undergoes deletion and the resultant sentence is (73) (Chao, 1968:318; J. Li, 1969:125; Tang, 1985b:204). Thus, we may assume that for the verb 'gei' (to give), there is an additional derivation to those in (74-76) - one which deletes the adjacent, phonetically identical P, when BA-insertion in (76b) applies:

(78) BA-NP2-V-[P(dative) NP1] => BA-NP2-V-[ $\emptyset$  NP1]

In fact, it seems universal in Chinese that a functional item X deletes under phonetical identity with a lexical item Y, if X immediately follows Y. E.g. see Zhu (1984:133) for deletion of the particle 'De' when immediately following the verb 'De'(to gain/obtain), and Chen (1978) for deletion of the preposition ZAI(at) when immediately following the progressive aspect marker Zai.

#### 2.3.2.4 PPs

Just as VPs show the head-initial surface form V-NP, PPs taking a NP complement have the surface form P-NP in Chinese.

In (69b), I have assumed with the case of VPs (and with the case of NPs presented earlier in 2.3.1) that PPs in Chinese are in fact underlyingly head-final, and should undergo the transformation NP-P => P-NP. But evidence for such assumptions needs to be sought in future research.

Similar to the case of VPs, the head-final ordering of PPs should apply not only to NP complement, but also to other types of complement. It is observed, for example, that apart from NP, prepositions in Chinese take clauses and APs as complement (He, 1987). E.g.

(79)a. wo [chen [ta bu zhuyi]] chi-le san-ge mianbao.

          P          S  
I while 3sg not notice eat-asp three-m.p bread

- I ate three rolls while he did not notice.

b. zhe-ben shu [dui [ni xuexi Hanyu]] hen you yong.

          P          S  
this-m.p book to you learn Chinese very have use

- This book is very useful for your study of Chinese.

c. ni [chen [zaol] zou ba.  
     P    ADV  
 you while early go cl.p

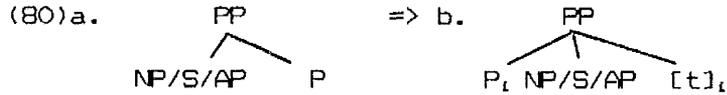
- You'd better go while it is still early.

d. ta [cong [hen xiao]] shuo Yingyu.  
     P    ADV  ADJ  
 3sg from very young speak English

- S/He has spoken English from an early age.

(79a-b) show a P followed by a clause, and (79c-d) a P followed by an adjective with or without a modifier.

Thus, assuming P-movement in PPs by sister-adjunction, we then have:



Note that in comparison with verbs taking clausal complements, which are marked as S' (see (61)), when prepositions take clausal complements, the clausal complements are marked as S. This is because when prepositions take clausal complements, they are assumed to function as complementisers of these clauses, i.e. if PP → P S, then PP = S' (cf. Emonds, 1985:295; Muysken and van Riemsdijk, 1986:16).

But in the chapters that follow, where PPs are structurally represented (in trees and brackets), the trace in (80) may not be shown, for the sake of simplicity of presentation.

### 2.3.3 Case Adjacency

As stated in 1.1, Case-adjacency is parametrical, and applies, for example, in languages like English (see (17) of 1.1). To see whether it applies in Chinese, consider:

(81)a. Ta hen xihuan huar./ \*Ta xihuan hen huar.  
 ADV V NP V ADV NP  
 3sg very like flower

- S/He likes flowers very much.

b. Ta gang-gang chi-wan fan./ \*Ta chi-wan gang-gang fan.  
 ADV V-V NP V-V ADV NP  
 3sg just-now eat-finish meal

- S/He has just finished eating.

c. Ta [zai Beijing] shang xue./ \*Ta shang [zai Beijing] xue.  
 PP V NP V PP NP  
 3sg at ... go school

- S/He goes to school in Beijing.

d. Ta jie [gei wo] qian.  
 V PP NP  
 3sg lend to me money

- S/He lends me money.

(81a-c) seem to show that Case-assignment in Chinese is also under adjacency, as adverbial elements cannot be admitted between the verb (= Case-assigner) and its object (= Case-assignee) <12>.

However, (81d) appears to contradict this. But as I demonstrated in He (1987), the NP in (81d) has actually shifted from a position before the PP. Compare (81d) with (82) below:

(82) Ta jie qian [gei wo]  
 V NP PP  
 3sg lend money to me

- S/He lends me money.

which has exactly the same interpretation as (81d), suggesting a derivation.

According to Chomsky (1982, 1986a), Case-assignment to a shifted NP occurs before the shifting, and when a NP shifts, it carries its Case with it. This analysis is in agreement with the so-called NP-trace condition (Chomsky, 1986b), which states that a NP-trace left by NP-movement should not carry Case. A supplement to this analysis is made

under the chain theory (Chomsky, 1986a:95ff, 135ff). Recall that a moved category and its trace(s) form a chain [  $\alpha_i$ ,  $t_i$  ]. A chain is Case-marked if one of its members is so marked (see 1.1). Thus, in the case of (81d-82), a chain [  $NP_i$ ,  $t_i$  ] should be created by the NP-shift from (82) to (81d), and the chain is Case-marked because the moved NP is so marked. Therefore, the NP after the PP in (81d) still has Case through the chain, hence its grammaticality (in contrast to (81c)).

## 2.4 Binding Conditions

In this section, I discuss binding of anaphoric and pronominal subjects in clauses and NPs in Chinese.

### 2.4.1 Binding of Anaphors

#### 2.4.1.1 SUBJECT and Accessibility

As demonstrated in 1.1, in a language like English where the nominative island condition (NIC) applies, there is no anaphoric subject in clauses.

In Chinese, anaphors do occur as [NP, S], e.g.

(83)a. Ta shuo ziji qu.

3sg say self go

- S/He says that s/he will go her/himself.

b. Lisi shuo xiwang ziji qu.

... say wish self go

- Lisi says that he wishes to go himself.

c. Ta mei jiao wo, ziji xiaowu zou-le.

3sg not call me self afternoon leave asp

- S/He did not call me, and left her/himself in the afternoon.

Thus, the NIC seems irrelevant in Chinese.

Recall Condition A on binding: an anaphor must be bound in its governing category, which contains an accessible SUBJECT and a governor of the anaphor (see 1.1). The key issue concerning anaphoric binding in Chinese is that of accessible SUBJECT. Firstly, a SUBJECT is defined as AGR (see 1.1), which however does not exist in Chinese. So we must determine what element functions as SUBJECT in Chinese. Secondly, as a result of lack of AGR, the accessibility of a SUBJECT to an anaphor in Chinese is not conditioned in the same way as it is in a language like English which takes AGR as SUBJECT. Let us clarify these matters by examining the binding of an anaphor in the sentences in (83) one by one.

First, the binding of the anaphor in (83a) is construed in:

(84) [ta<sub>i</sub> shuo [[ziji<sub>i</sub> qu]]]

3sg say self go

- S/He says that s/he will go her/himself.

In (84), the only element which is related to the anaphor 'ziji' (self) is the antecedent of this anaphor. This alludes to the conclusion that the antecedent of an anaphor serves as a SUBJECT in Chinese, if the notion of SUBJECT is to be maintained for Chinese (cf. Huang, 1982b).

As stated in 1.1, if an anaphor does not have an accessible SUBJECT in its own clause, it takes one in a higher domain, which then counts as the governing category for the anaphor. In the case of (84), the anaphor does not have a SUBJECT (= antecedent) in its own clause, so that it has to take one in a higher domain, i.e. [NP, S] of the matrix clause. As this SUBJECT is the only one available, it has to be accessible. Thus,

the governing category for the anaphor in (84) is the matrix clause, which contains an accessible SUBJECT (= the antecedent) of the anaphor, and the governor (= INFL, unshown) of the anaphor. In this governing category, the anaphor is bound by its antecedent, satisfying Binding Condition A.

Now, consider the binding of the anaphor in (83b) in:

(85) [Lisi<sub>i</sub> shuo [[pro<sub>i</sub> [xiwang [[ziji<sub>i</sub> qu]]]]]]

... say wish self go

- Lisi says that he wishes to go himself.

First of all, the subject of the second embedded clause in (85) is identified as a *pro*, following the observation that empty subjects of embedded clauses in Chinese are [*pro*, S] (see (36) of 2.2.3).

As far as the binding of the anaphor in (85) is concerned, again, the anaphor does not have a SUBJECT in its own clause and has to take one in a higher domain. There are two superordinate clauses in relation to the clause in which the anaphor occurs. Each of them contains an antecedent, thus SUBJECT, of the anaphor. Namely, [*pro*, S] of the second embedded clause, and [NP, S] of the matrix clause. This means that there are two SUBJECTs available for the purpose of binding the anaphor. The question is which of them is accessible to the anaphor. The answer to this question will tell us what determines the accessibility of a SUBJECT in Chinese.

As illustrated in (23b) of 1.1 with English in which AGR counts as SUBJECT, the accessibility of a SUBJECT is based on whether the co-indexing of a SUBJECT with an anaphor will cause a violation of the *i*-within-*i* condition. But, as a SUBJECT in Chinese is at the same time the antecedent of an anaphor, there is no question of violation of the *i*-within-*i* condition by the co-indexing of a SUBJECT with an

anaphor, as we see in (85). Thus, the factor determining accessibility in Chinese is the scope of antecedency, or the governing category in which an anaphor is bound.

Suppose that we take [pro, S] in (85) as the accessible SUBJECT. It means that the second embedded clause will be the governing category for the anaphor, i.e. the anaphor is bound by [pro, S]. But if we take [NP, S] of the matrix clause as the accessible SUBJECT, the matrix clause will be the governing category for the anaphor, which is then bound by [NP, S]. To decide in which governing category the anaphor is bound, compare (85) with (86) below:

(86) [Lisi<sub>i</sub> shuo [[ta<sub>i,j</sub> xiwang [[ziji<sub>i,j</sub> qu]]]]]

... say 3sg wish self go

a. - Lisi says that he wishes to go himself.

b. - Lisi says that he (not Lisi) wishes to go himself.

Instead of containing [pro, S] in the second embedded clause, (86) has a [NP, S] in this position. As a result, (86) is ambiguous. Now, let us mark the NPs in three subject positions in (86) as [NP(R), S], [NP(+p), S] and [NP(+a), S] respectively, where R stands for R-expression, +p for pronominal and +a for anaphoric. To spell it out, [NP(R), S] is 'Lisi' (a person's name), [NP(+p), S] is 'ta' (he), and [NP(+a), S] is 'ziji' (self), the anaphor. If we take [NP(+p), S] as the accessible SUBJECT to [NP(+a), S], then [NP(+a), S] is bound in the second embedded clause, and we get the reading in (86b), i.e. [NP(+a), S] is disjoint in reference with [NP(R), S]. But if we take [NP(R), S] as the accessible SUBJECT to [NP(+a), S], [NP(+a), S] will be bound in the matrix clause, and we get the reading in (86a), where [NP(+a), S] is coreferential with [NP(R), S]. Both cases are illustrated in:

(87)a. [Lisi<sub>i</sub> shuo [[ta<sub>i</sub> xiwang [[ziji<sub>i</sub> qu]]]]]

... say 3sg wish self go

- Lisi says that he wishes to go himself.

b. Lisi<sub>i</sub> shuo [[ta<sub>j</sub> xiwang [[ziji<sub>i</sub> qu]]]]]

... say 3sg wish self go

- Lisi says that he (not Lisi) wishes to go himself.

Apparently, (87a) shares the same reading as (85). Thus, returning to (85), we should take [NP(R), S], rather than [pro, S], as the accessible SUBJECT, and the matrix clause is then the governing category for [NP(+a), S]. In this governing category, [NP(+a), S] is bound, hence meeting Condition A.

As for the reason why [pro, S] in (85) does not raise any ambiguity as [NP(+p), S] in (87) does, we have already explained similar cases in 2.2.3, viz. it is due to the Avoid Pronoun Principle (Chomsky, 1986b), under which we assume that [pro, S] is internally preferred by grammar to [NP(+p), S], if they share the same reference. However, once [NP(+p), S] is used in an embedded clause, it may or may not be in coreference with an NP in a superordinate clause, so ambiguity arises. A related fact is that since [pro, S] has to be coreferential with a NP in a superordinate clause, it may not serve as a binder to an anaphor, as shown in (85-87a).

To sum up, a SUBJECT in Chinese is at the same time the antecedent of an anaphor. To decide whether a SUBJECT is accessible (among those available) is to see whether this SUBJECT binds the anaphor. That is to say that while a (non-accessible) SUBJECT is only an antecedent of the anaphor, an accessible SUBJECT is the binder of that anaphor.

#### 2.4.1.2 Empty-topic Binding

Now we come to (83c), which is a special case for anaphoric binding. In appearance, the anaphor 'ziji' (self) is coreferential with the subject of the preceding clause, which is (structurally) independent of the clause in which the anaphor occurs. As it is defined, binding is under c-commanding, which does not extend from one independent clause to another. So, how is the anaphor bound in (83c)?

To work on a solution to the problem we are facing, I hereby mention the discourse-oriented vs. sentence-oriented parameter, which is independently initiated in Tsao (1977, 1978), and tentatively brought into the GB framework in Huang (1984). This parameter subsumes a cluster of properties of the so-called discourse-oriented languages. The first of these properties is that this type of language contains a topic in each independent clause, and topics in a series of clauses in a discourse form a topic chain. According to Tsao (1977, 1978), the antecedency between the topics of a topic chain works under a Topic Deletion Rule, which operates across a discourse to delete topic(s) under identity with the first topic of a topic chain. But, because the first topic of a topic chain is often absent, it has been suggested that a missing topic should be treated as being empty, i.e. as a 'zero topic', and that a co-indexation rule be adopted which operates across a topic chain to co-index the related topics. This co-indexation rule will operate after LF and be part of the module of discourse grammar added to the existing GB (cf. Huang, 1984).

The notion of 'zero topic' also seems to have empirical grounds. Huang (1984:551) mentions that languages like Chinese, Japanese, Korean and Portuguese all seem to lack the *that-t* effect in standard

subject-object asymmetry, and to be able to sustain long extraction of a subject/object. Such properties, according to Huang following a suggestion of Osvaldo Jaeggli (personal communication to Huang (1984)), are plausibly related to the possibility of these languages having an empty topic binding a variable in subject/object position.

To complement Huang (1984), we find that an empty topic seems to be unable to recover. Consider the following in which the symbol "O" represents a zero topic:

(88)a. [Lisi<sub>i</sub>, [piqi hen huai]], [ O<sub>i</sub> [qian hen duo]],  
... temper very bad money very much  
[ O<sub>i</sub> [fangzi da]].  
house big

- As for Lisi, he has got a bad temper, a lot of money and a big house.

b. ??[Lisi, [piqi hen huai]],  
... temper very bad  
- Lisi, his temper is bad;  
[Lisi, [qian hen duo]],  
... money very much  
- Lisi, he has a lot of money;  
[Lisi, [fangzi da]].  
... house big  
- Lisi, his house is big.

(89)a. [nachang qiu<sub>i</sub>, [xingkui ni lai-le]], [ O<sub>i</sub> [women mei mai piao]]  
that game fortunately you come asp we not buy ticket  
- That game, fortunately you came; we did not buy tickets.

- b. ??[nachang qiu, [xingkui ni lai-le]],  
     that game       fortunately you come asp  
     - That game, fortunately you came;  
     [nachang qiu, [women mei mai piao]].  
     that game       we     not buy ticket  
     - That game, we did not buy tickets.

(88b) and (89b) are unacceptable each as a single discourse. As deletion under identity is normally free to recover, such as coordinate deletion, the missing topic(s) in (88-89) are better treated as being empty rather than deleted.

Now consider the case of (83c). The phenomenon displayed here is that an [NP(+a), S] appears to be discursively bound. This in fact is not a new observation of its kind. Yang (1983) made a similar observation in Korean, another discourse-oriented language. According to Yang (1983), binding between independent clauses across the discourse can be resolved by extending the existing binding theory. Huang (1984) further speculates that "discoursal binding" may be a property of the discourse-oriented languages. In this study, however, I intend to adopt a different approach, i.e. empty-topic binding. Resuming the example in (83c), the key issue involved is, as stated earlier, that binding is under the principle of c-commanding, which does not operate across independent clauses. Thus, there has to be a way of solving this problem.

Assuming along with Huang (1984) the existence of a zero topic in independent clauses in Chinese, I shall first argue that a zero topic may also bind a [NP(+a), S], and then examine the assumption further.

As it is, neither clause in (83c) has an overt topic. So, we assume that each of them contains a zero topic, and that the zero topics form a

topic chain. In this topic chain, the second zero topic is in coreference with the first one, as all topics in a chain should be identified by the first one (Tsao, 1977, 1978). Besides, unlike an overt topic which may obtain an independent reference (cf. Li and Thompson, 1976, 1981), a zero topic has to be identified by an element of its own clause, owing to the recoverability principle (Chomsky and Lasnik, 1977). In the case of (83c), suppose that the first zero topic is identified by the following [NP, S]. Consequently, the second zero topic is also identified by the [NP, S], and becomes an antecedent of the [NP(+a), S], as shown in:

(90) [ O<sub>i</sub> [ta<sub>i</sub> mei jiao wo]], [ O<sub>i</sub> [ziji<sub>i</sub> xiaowu zou-le]]

3sg not call me self afternoon leave asp

- S/He did not call me, and left her/himself in the afternoon.

Being an antecedent of the [NP(+a), S], the second zero topic is an accessible SUBJECT, as there is no other SUBJECT in this clause. Thus, [NP(+a), S] is bound in its own root clause serving as the governing category, hence meeting Condition A.

Though a relatively simple execution, the binding of a [NP(+a), S] in (90) is by no means inadequate, if the assumption that there is a zero topic in each independent clause is sound. If this assumption stands, the mechanism used in (90) seems to have captured a basic fact regarding binding a [NP(+a), S] in discourse-oriented languages. Consider more cases in (104) in which the first topic of a topic chain is not missing:

(91)a. [ni didi<sub>i</sub>, [ta<sub>i</sub> mei jiao wo]], [ O<sub>i</sub> [ziji<sub>i</sub> xiaowu zou-le]]

your brother 3sg not call me self afternoon leave asp

- Your brother did not call me, and left himself in the afternoon.

- b. [Zhangsan zhege ren<sub>i</sub>, [ta<sub>i</sub> bu yao bieren bang mang]],  
 ... this person 3sg not want others help business  
 keshi [ O<sub>i</sub> [ziji<sub>i</sub> you bu hui]]  
 but self even not able  
 - This person Zhangsan, he does not want people to help him  
 with his business, but he himself is not able to do it.
- c. [Lisi<sub>i</sub>, [piqi hen huai]], [ O<sub>i</sub> [qian hen duo]],  
 ... temper very bad money very much  
 [ O<sub>i</sub> [fangzi da]], [ O<sub>i</sub> [ziji<sub>i</sub> juede hen liao-bu-qi]]  
 house big self feel very complacent  
 - As for Lisi, he has got a bad temper, a lot of money and  
 a big house, and he is very complacent himself.

Again, the [NP(+a), S] in each case of (91) is construed in such a way that it is bound by an adjacent zero topic. This means that although a [NP(+a), S] in sentences like (91a-c) may appear to be discursively bound by its antecedent, it is in fact still locally bound.

If valid, the analysis in (91) endorses the assumption of there being a zero topic in each independent clause. I shall examine this assumption in the following section by looking at topic position in a given language.

#### 2.4.1.3 Topic Position

The sentences in (91) exemplify what Li and Thompson (1976, 1981) call the typical topic-prominent feature for the discourse-oriented languages. That is, sentences of this type seem to be organised on a topic-comment basis, rather than on a subject-predicate basis, which may be called subject-prominence (Huang, 1984:549-551; Emonds, 1985:132ff).

The crucial point about topic-prominence is that a topic may or may not be identified by an element of the clause that accompanies the topic, such as we see in (88-89) and (91). In terms of  $\theta$ -marking, it means that a topic in a topic-prominent language may have an independent  $\theta$ -role. This is exactly what we have seen in (88-89), and it makes a basic distinction between topic-prominence and subject-prominence. In a subject-prominent language such as English, a topic is normally derived from another position such as subject/object position; therefore, the topic carries the same  $\theta$ -role as in its original position. The fact that a topic in a topic-prominent language may have an independent  $\theta$ -role leads to a further deduction that topic position in such a language is base-generated rather than being a derived position (also see Huang (1984:549-551) for a different line of argument). If so, the notion that every independent clause in such a language may contain a zero topic is plausible.

It is worth emphasizing the distinction between a topic holding an independent  $\theta$ -role and one that carries the same  $\theta$ -role as another element does in the clause in which the topic occurs. Note that the former type of topic occurs, in my view, only in topic-prominent languages, but the latter type may occur in both topic- and subject-prominent languages. Thus, whether a topic has an independent  $\theta$ -role serves as a criterion for a base-generated topic. This criterion thus excludes such an argument as left dislocation for a base-generated topic. In left dislocation, a topicalised element leaves a resumptive pronoun in its original position. This configuration may appear to argue for a base-generated topic, as Chung (1978:19) suggested. But the topic in this case does not hold an independent  $\theta$ -role, unlike the cases we have seen in (88-89).

If a given language has a base-generated topic position, where should this position be? How is it governed,  $\theta$ - and Case-marked? These questions do not seem to have clear answers. I shall briefly discuss them below.

It is first of all necessary to clarify whether a topic-prominent language also requires a subject, or in GB terms, whether it obeys the Extended Projection Principle (EPP). Although it is a stipulation, the EPP captures two facts. One, it accounts for pleonastic elements such as *it* and *there* in a subject-prominent language like English; secondly, it is in agreement with the fact that there are very strict lexical restrictions on what  $\theta$ -role the subject of a particular verb may assume, i.e. subject bears a  $\theta$ -role decided by a chosen verb (Jackendoff, 1972). Emonds (1985:134ff) suggests that some topic-prominent languages may violate the EPP, so that topic in these languages may occur in the position normally assigned to subject, though the distinction remains that topic may assume any  $\theta$ -role with respect to the verb, and subject has to take a given  $\theta$ -role from the verb.

As far as Chinese is concerned, though it may be topic-prominent (Li and Thompson, 1976), it certainly obeys the EPP in that subject in Chinese has to assume a  $\theta$ -role determined by a chosen verb. The fact that the topic and the subject in a Chinese sentence may have different  $\theta$ -roles demonstrates this point (see (89)). Besides, it has been argued that although Chinese does not have pleonastic subjects, when a subject is empty, it is *pro*, or it could be viewed as a variable bound by a zero topic (Huang, 1984), so that an empty subject in this case still occupies a structural position. Thus, topic and subject in Chinese cannot be in the same position.

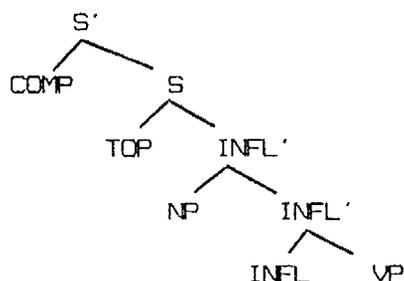
It is a standard assumption that topic position is in COMP in a

subject-prominent language, e.g. English, for a topic in this type of language is derived by Move  $\alpha$  and has no independent  $\theta$ -role. Therefore, COMP position is putatively taken as an  $\bar{A}$ -position. However, a topic derived from other position(s) may also occur in Chinese, or in any other topic-prominent language. COMP remains an  $\bar{A}$ -position (= non- $\theta$ -marking position) in Chinese. The point at issue is that if Chinese has a base-generated topic position which may receive an independent  $\theta$ -role, this topic position must not be in COMP. We may also look at this from the government point of view.

Given that a topic in Chinese may have an independent  $\theta$ -role (see (89)), and given that it may be a NP (also see (89)), this topic NP is therefore Case-marked. In theory,  $\theta$ - and Case-marking should both be under government. Huang (1984) suggests that INFL in Chinese might also govern topic position, e.g. a zero topic. The technical problem, though, is that if this topic position in question is in COMP (which Huang (1984) does not say), it cannot in fact be governed by INFL, because, under the standard clausal structure (see (3) of 2.1.1), INFL is unable to govern the COMP position, for S as a maximal projection is a barrier to this government.

One way of solving this problem on the basis of the standard clausal structure is to assume that the categorial rule  $X' \rightarrow M X'$  (M = modifier) is recursive (cf. Andrews, 1983). Then we may have the following, where TOP stands for topic:

(92)



Thus, INFL in (92) governs both [NP, S] and [TOP, S]. When [TOP, S] is a NP, it also receives a Case from INFL. Presumably, this Case is inherent. Just as verbs may assign inherent Case to their direct objects at D-structure and structural Case to their indirect objects at S-structure, INFL assigns inherent Case to [TOP, S] where [TOP, S] = NP, and structural Case to [NP, S]. As far as the  $\theta$ -marking of [TOP, S] is concerned, because [TOP, S] may assume any  $\theta$ -role with respect to the verb, the  $\theta$ -assignment to [TOP, S] may have to do with the nature of a topic. Unlike subject, which is a syntactic notion, topic is a discursal notion. This means that while topic may have a semantic domain containing more than one clause, subject does not (Tsao, 1977, 1978). In other words, [TOP, S] is bound to a discourse, but [NP, S] is bound to a clause. If we assume that verbs in discourse-oriented languages may assign two external  $\theta$ -roles, one to [NP, S] and the other to [TOP, S], the  $\theta$ -role assigned to [TOP, S] by a given verb is therefore not subject to any lexical restrictions, which apply, as Jackendoff (1972) points out, to the  $\theta$ -role assigned to [NP, S]. But exactly what conditions the  $\theta$ -assignment to [TOP, S] is subject to is beyond the scope of our discussion here.

It is stated in 2.2.1 that [NP, S] in Chinese is assigned nominative Case, though Chinese verbs do not inflect to identify their subjects. It is unlikely that [TOP, S] is also assigned nominative Case. There are two reasons for this. Firstly, if the Case assigned to [TOP, S] is inherent as assumed above, it cannot be nominative because inherent Case is either oblique or genitive (see 1.1). Secondly, Tsao (1977, 1978) found that [TOP, S] plays no role in such syntactic processes as reflexivisation, passivisation, imperativisation,

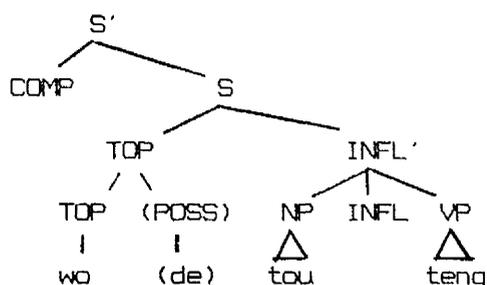
verb-serialisation and Equi-NP deletion; but [NP, S] does. This means that although [NP, S] in Chinese is not identified as being nominative by way of inflections of verbs, its nominative nature is exhibited in the above-mentioned syntactic processes.

It is possible that the Case assigned to [TOP, S] is either oblique or genitive. The topic in (89), for example, may well carry an oblique Case. Data which show a [TOP, S] of genitive Case may come from the following sentences, once known as "double-nominatives" (Teng, 1974, 1975) and then "pseudo-possessives" (Huang 1988):

- (93)a. Wo (de) tou teng.  
NP NP V  
I ('s) head ache  
- My head aches.
- b. Lisi (de) gongzuo hen mang.  
NP NP V  
... ('s) work very busy  
- Lisi is busy at work.
- c. Zhangsan (de) baba si-le.  
NP NP V  
... ('s) father die asp  
- Zhangsan's father is dead.

The fact that the POSS-marker 'De' may follow the first NP in (93a-c) serves as a strong proof that this NP is genitive, as POSS-insertion is triggered by genitive NP. The key issue here is how to account for the optional presence of 'De'. As we have seen in 2.3.1, a genuine possessive NP is followed by an obligatory 'De'. Thus, it is highly plausible that the optional presence of 'De' in (93a-c) is due to the fact that the first NP, though genitive, is not really in a possessive NP position in relation to the second NP, but rather in a topic position, such as in:

(94)



To consolidate the analysis in (94), we may further compare the data in (93) with those in (95) below:

(95)a. Wo, (\*de) tou teng./Wo (\*de), tou teng.

NP NP V  
I ('s) head ache

- As for me, my head aches.

b. Lisi, (\*de) gongzuo hen mang./Lisi (\*de), gongzuo hen mang.

NP NP V  
... ('s) work very busy

- As for Lisi, he is busy at work.

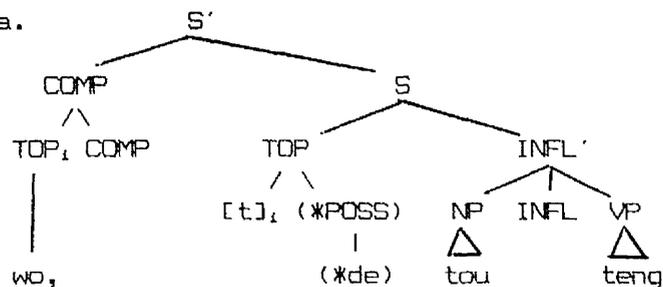
c. Zhangsan, (\*de) baba si-le./Zhangsan (\*de), baba si-le.

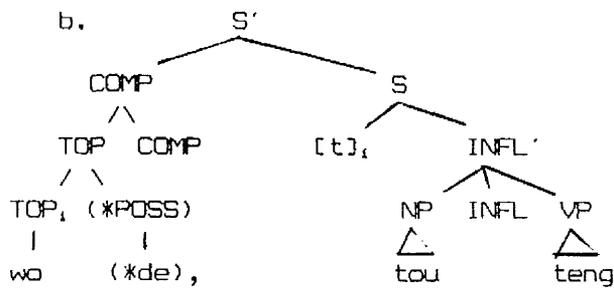
NP NP V  
... ('s) father die asp

- As for Zhangsan, his father is dead.

The fact that when the first NP is topicalised, the insertion of 'De' becomes impossible, further supports the analysis in (94). As shown in (16c) of 1.1, the NP that receives POSS-insertion must be within the same maximal projection as the head noun. In (95a-c), the first NP has in fact moved into COMP, so that the context for POSS-insertion no longer exists, hence the ungrammaticality, as illustrated in:

(96)a.





Now, given the analyses in (94) and (96), I would like briefly to discuss two related issues: movement of [TOP, S] into COMP and government of its trace. As we see in (96), the topic NP moves out of the S into COMP. This accounts for the fact that while a topic with an independent  $\theta$ -role must be treated as a base-generated element, this topic may also be separated from the rest of the clause by a pause or a pause particle (Tsao, 1977, 1978). So far, we have seen a pause which separates a topic from its clause in the examples given in this section. Consider a pause particle which does this job in the following:

(97)a. Wo a, tou teng.

NP NP V  
I p.p. head ache

- As for me, my head aches.

b. Lisi me, gongzuo hen mang.

NP NP V  
... p.p. work very busy

- As for Lisi, he is busy at work.

c. Zhangsan ya, baba si-le.

NP NP V  
... p.p. father die asp

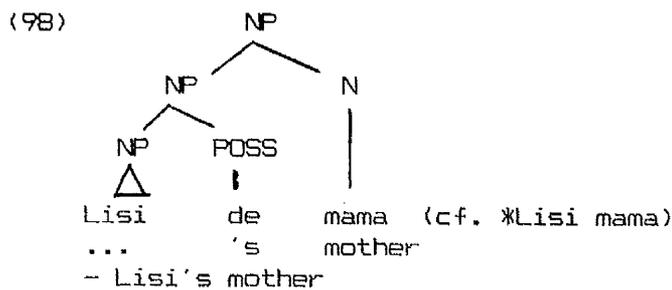
- As for Zhangsan, his father is dead.

According to Tsao (1977, 1978), the most reliable way to identify a topic is to see whether it can be separated by a pause particle (there are four of them in Chinese). Thus, (97) provides yet another piece of evidence that the first NP in (93) and (97) is a topic.

As it stands, the trace of the moved topic NP in (96) is governed

by INFL. If we adopt the ECP approach to topic position as Huang (1984) does, this trace should also be properly governed by INFL. But, as we stated in 2.2.2, we intend to follow Aoun's (1984, 1986) generalised binding theory in the present study. Under Aoun's approach, the detail of which will be presented in 2.4.2, the trace in (96) is treated as an anaphor, and it needs no proper government but to be bound by its antecedent. As we see in (96), this condition is fulfilled.

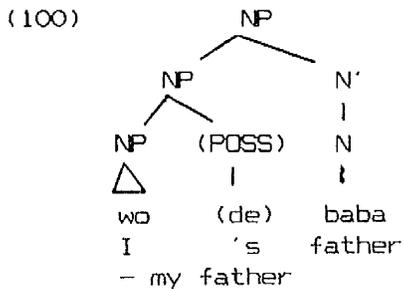
Finally, it is worth clarifying further about the optional POSS-marker 'De' in (93a-c). As demonstrated in 2.3.1, 'De' is obligatory in a genuine possessive NP structure, repeated in:



But it has been a long-standing observation that in some cases 'De' can be optional, as in:

- (99)a. ta (de) mama  
 3sg ('s) mother  
 - his/her mother
- b. wo (de) baba  
 I ('s) father  
 - my father

In my view, the cases in (99) represent a different structure from that in (98). The structure in question is:



In (100), the possessive NP 'wo'(I) is a sister to N', rather than to N as it is in (98). But it still allows an optional POSS-insertion because it is genitive. One piece of evidence in support of the structural difference between (98) and (100) is as follows:

(101)a. Wo kanjian-le ta mama he ni mama.  
 I see asp 3sg mother and you mother  
 - I saw his mother and your mother.

b. \*Wo kanjian-le ta \_\_ he ni mama.  
 I see asp 3sg and you mother

(102)a. Wo kanjian-le ta-de mama he ni-de mama. (cf. 101a)  
 I see asp 3sg-'s mother and you-'s mother  
 - I saw his mother and your mother.

b. Wo kanjian-le ta-de \_\_ he ni-de mama. (cf. 101b)  
 I see asp 3sg-'s and you-'s mother  
 - I saw his mother and your mother.

The fact that the peripheral, identical noun 'mama'(mother) in (101b) does not delete indicates that this noun is not immediately dominated by the conjunct. This clearly supports the structure in (100) when it does not contain 'De' (as it is optional). Furthermore, the fact that this noun deletes in (102b) when the POSS-marker 'De' is present, suggests that it is immediately dominated by the conjunct, hence the structure in (98). The obligatoriness of 'De' in (102) is indirectly demonstrated through (101b), which shows that the deletion is blocked if

'De' is missing.

Note again that the possessive NP in (100) is a sister to the N', in comparison with that in (98), which is a sister to the N. In other words, a genuine possessive NP can be either an internal or an external complement to the head noun within an NP. The structural difference between an internal and an external complement in this case is rightfully reflected by the contrast between the obligatory and the optional presence of the POSS-marker 'De'.

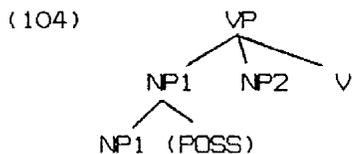
Returning to the optional POSS-marker 'De' in (93a-c), there are thus two points to be made. Firstly, because this 'De' is optional, the NP taking 'De' is structurally not a sister to the following NP, hence supporting the analysis in (94).

Another example is the behaviour of NP complements in some ditransitive constructions, which are in line with the following type of data:<13>

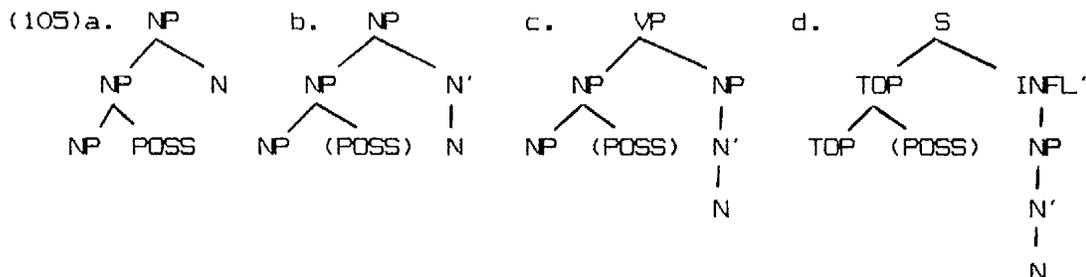
- (103)a. Ta huan wo (de) qian.  
          V NP1       NP2  
          3sg return me ('s) money  
          - He returns my money to me.
- b. Ta jie wo (de) qian.  
          V NP1       NP2  
          3sg borrow me ('s) money  
          - He borrows money from me.

In (103), both NPs are considered complements to the verb (cf. Zhu, 1984:118-119; Tang, 1985c:201), rather than NP1 being a complement to NP2, such as the NPs in the possessive NP construction (cf. 2.3.1).

Presumably, (103) can be analysed as follows (before V-movement) (cf. 2.3.2.3):



If we put the structures in (98) and in (100), and the relevant part of (94) and of (104) together, we then have:



These structures seem to reveal the way in which optional POSS-insertion behaves in Chinese, i.e. NP-NP => NP-(POSS)-NP, if the first NP is not structurally a sister to the second NP.

Secondly, it is easy to see the difference between the genuine possessive NP in (105a-b) and those so-called "pseudo-possessives" in (105c-d). The former is within a NP, but the latter is not; the former is in the argument structure of a NP, but the latter belongs to another argument structure, such as VP or S. However, the structural difference between (105a-b) and (105c-d) is difficult to read off surface forms, whose linear order is NP-(POSS)-NP for all these structures. This in fact contributes to what is probably one of the most intriguing issues in Chinese grammar, i.e. interaction of genuine possessive NPs with "pseudo-possessives", an issue whose full investigation is beyond the scope of the present discussion. But if we accept such a notion as "pseudo-possessives", there should be a criterion for it. This criterion is that a pseudo-possessive NP is not necessarily an argument of the following NP. I have already shown this point with data in (93) and (95) regarding [TOP, S] in (105d), as well

as with data in (103) regarding the indirect object of a ditransitive verb in (105c).

#### 2.4.1.4 Binding [NP(+a), NP]

Consider the [NP(+a), NP] in the following:

(106)a. ta<sub>i</sub> na [<sub>NP</sub> ziji<sub>i</sub> -de shu]

3sg take self 's book

- S/He took her/his own book.

b. ta<sub>i</sub> shuo [<sub>NP</sub> ziji<sub>i</sub> -de shu] bu hao

3sg say self 's book not good

- S/He said that her/his own book was not good.

c. ta<sub>i</sub> shuo pro<sub>i</sub> bu xihuan [<sub>NP</sub> ziji<sub>i</sub> -de shu]

3sg say not like self 's book

- S/He said that s/he did not like her/his own book.

In (106), the anaphor 'ziji' (self) has no binder - its antecedent and at the same time an accessible SUBJECT - in the NP in which it occurs. Thus, it has to take a binder in a higher domain. A higher domain which contains a binder is, respectively, the clause itself in (106a), the matrix clause in (106b), and the embedded as well as the matrix clause in (106c).

In the case of (106a) and of (106b), it is straightforward that the binder of the anaphor is the subject of the clause and of the matrix clause, as shown in:

(107)a. [ta<sub>i</sub> na [<sub>NP</sub> ziji<sub>i</sub> -de shu]]

3sg take self 's book

- S/He took her/his own book.

b. [ta<sub>i</sub> shuo [<sub>S</sub>[<sub>S</sub>[<sub>NP</sub> ziji<sub>i</sub> -de shu] bu hao]]

3sg say self 's book not good

- S/He said that her/his own book was not good.

As stated in 2.4.1.1, the domain which contains the binder of an anaphor is the governing category for the anaphor. It is clear that the [NP(a), NP] in (107a-b) is bound in its respective governing categories.

In the case of (106c), the anaphor has two antecedents: 'ta' (s/he) of the matrix clause and [pro, S] of the embedded clause. We have to determine which binds the anaphor. If the anaphor is bound by [pro, S] of the embedded clause, we then have:

(108) ta<sub>i</sub> shuo [<sub>S</sub>[pro<sub>i</sub> bu xihuan [<sub>NP</sub> ziji<sub>i</sub> -de shu]]

3sg say not like self 's book

- S/He said that s/he did not like her/his own book.

(108) means that the governing category for the anaphor is the embedded clause. As a result, the subject of the matrix clause may be disjoint in reference with the anaphor. But this is not what the sentence means, as its interpretation shows. In fact, as we have seen in 2.4.1.1, a [pro, S] of an embedded clause must be identified by the subject of its matrix clause, otherwise, when it is recovered, there may be a disjoint reference between this [pro, S] and its original antecedent. Taking (108) as an example, we may have:

(109) ta<sub>i</sub> shuo [ta<sub>i//</sub> bu xihuan [<sub>NP</sub> ziji<sub>i//</sub> -de shu]]

3sg say not like self 's book

- S/He said that s/he did not like her/his own book.

(The first 's/he' may not be the same as the second 's/he'.)

Thus it is clear that in order to maintain the original reading of (106c), i.e. where the [pro, S] is identified by the subject of the matrix clause, we have to take the subject of the matrix clause as the

binder of the anaphor, as in:

(110) [ta<sub>i</sub> shuo [pro<sub>i</sub> bu xihuan [<sub>NP</sub> ziji<sub>i</sub> -de shu]]]

3sg say not like self 's book

- S/He said that s/he did not like her/his own book.

According to the above results, we see that the binding of [NP(+a), NP] in Chinese is subject to the same conditions as the binding of [NP(+a), S] is (see 2.4.1.1).

#### 2.4.2 Generalised Binding

As we have seen in 2.2.2, there is a difference between Huang (1982b) and Aoun (1984, 1986) in their approaches to the issue of the *that-t* effect in Chinese.

It has been observed that a *that-t* configuration in Chinese does not exhibit any ill-formed effect in LF. Huang (1982b) argues that this is due to the variable in [NP, S] position being properly governed by INFL (see (28) of 2.2.2.1).

Aoun (1984, 1986), however, suggests that the *that-t* effect in Chinese is in fact suspended owing to the absence of the NIC in this language. He discovers that there is a difference in binding a variable in [NP, S] position between a language to which the NIC applies and one in which the NIC is absent. That is, the variable in the former type of language, such as English, has to be locally bound, but the variable in the latter type of language, such as Chinese, does not have to be so bound. Therefore, a configuration like [ t<sub>i</sub> that [ x<sub>i</sub> VP]] is ill-formed in English because the presence of *that* prevents the trace from binding the following variable, given that the variable has to be locally bound (see 4.4.1.1 for the mechanism involved). But such a

configuration is not ill-formed in Chinese, because the variable can have a binder outside this configuration, e.g. in a higher domain (see (28) of 2.2.2.1). Moreover, the presence or absence of the NIC in a given language also has to do with whether [NP(+a), S] is allowed in that language. According to Aoun (1984, 1986), this is the reason behind the above-mentioned difference in binding a variable in [NP, S] position between NIC-present and NIC-absent languages. Namely, the NIC-present languages do not allow [NP(+a), S] but the NIC-absent languages do. So, if we regard a variable in [NP, S] position as an empty [NP(+a), S], it is obvious that it has to be locally bound in NIC-present languages because it is not supposed to be in this position; the fact that it requires to be locally bound imposes a condition on its occurrence in this position. On the other hand, this condition of local binding does not apply to an empty [NP(+a), S] in NIC-absent languages, because [NP(+a), S] is allowed in these languages, though it still has to be bound for being an anaphor. Thus, following Aoun's approach, we in effect have a systematic account both for the fact that there is no *that-t* effect in Chinese and for the fact that [NP(+a), S] is allowed in this language, i.e. both of these are due to the absence of the NIC. Aoun (1984, 1986) terms his approach "generalised binding".

The major consequence of Aoun's (1984, 1986) approach is, as stated in 2.2.2, that the ECP is irrelevant in Chinese, and that it is treated as a parameter in general. This, in my view, is not problematic itself, because if we adopt the ECP as a universal principle, we have to stipulate INFL to be a proper governor in Chinese as Huang (1982b) did. But to the best of my knowledge this stipulation has not yet had any empirical justification. Aoun's (1984, 1986) approach, on the other hand, seems to have a certain empirical justification, i.e. the NIC,

which has an impact on Chinese as well as on other languages. Suppose that the ECP and the NIC form a binary feature such as  $[\pm\text{ECP}, \pm\text{NIC}]$ . Then, in a language which is  $[\text{+ECP}, \text{+NIC}]$ ,  $[\text{NP}(+a), \text{S}]$  is barred; if the *that-t* effect occurs, the binding of  $[\text{t}, \text{S}]$  is not locally satisfied. But in a language which is  $[\text{-ECP}, \text{-NIC}]$ ,  $[\text{NP}(+a), \text{S}]$  is allowed, and because  $[\text{t}, \text{S}]$  need not be locally bound, there is no *that-t* effect.

I make no comment on Aoun's (1984, 1986) approach to an integrated theory of generalised binding, but only consider its application to Chinese a preferable alternative to Huang's (1982b) approach. As I stated in 2.2.2.1, Aoun's approach needs to be tested with a wider range of Chinese data than has already been used. I shall adopt this approach in this thesis wherever binding applies.

A brief outline of Aoun's (1984, 1986) generalised binding approach is as follows. The major shift of this approach away from Chomsky's (1982, 1986a-b) binding theory is that variables become bound in the same way as anaphors do. Aoun (1981, 1985) defines two types of anaphors: a) A-anaphor, which has an antecedent in A-position, such as NP-trace, and b)  $\bar{\text{A}}$ -anaphor, which has an antecedent in  $\bar{\text{A}}$ -position, such as variables. These two types of anaphor hold two types of binding relation: A- and  $\bar{\text{A}}$ -binding. Aoun (1984:14, 1986:6), following Finer (1984) and Borer (1984b), formulates the following binding conditions:

- (111) Given  $X = \text{A}$  or  $\bar{\text{A}}$ :
- A. An anaphor must be X-bound in its governing category;
  - B. A pronominal must be X-free in its governing category;
  - C. An R-expression must be A-free.

Given (111), I am mainly concerned with  $\bar{\text{A}}$ -anaphors, i.e. variables. According to Aoun (1986), variables must satisfy both the Binding Conditions A and C. What this means exactly is that a variable needs a c-commanding  $\bar{\text{A}}$ -binder in its governing category. To illustrate this,

resume the examples in (28) of 2.2.2.1, reproduced in:

(112)a. [<sub>S</sub>[<sub>COMP</sub> shei<sub>i</sub> ] [<sub>S</sub> ... [<sub>S</sub> t<sub>i</sub> gen [<sub>S</sub> t<sub>i</sub> lai]] ...]]

who with come

"who is the person x such that the issue matters the most  
with x's coming?"

b. [<sub>S</sub>[<sub>COMP</sub> shei<sub>i</sub> ] [<sub>S</sub> ... [<sub>S</sub> t<sub>i</sub> gen [S ni xihuan t<sub>i</sub> ]] ...]]

who with you like

"who is the person x such that the issue matters the most  
with your liking x?"

In (112a), the variable in [NP, S] position of the embedded clause has an  $\bar{A}$ -antecedent, the co-indexed trace, which, however, does not count as an  $\bar{A}$ -binder because it cannot bind the variable in the presence of the complementiser 'gen' (with). Thus, it has to take an  $\bar{A}$ -binder in a higher domain. The higher S is excluded because it contains no such binder. So the still higher S' is taken, which contains the wh-item 'shei' (who), the required  $\bar{A}$ -binder of the variable. Again, because the variable need not be locally bound, the presence of the *that-t* configuration is irrelevant. For (112b), the same reasoning for (112a) applies, except that the variable is in [NP, VP] position.

Note that the co-indexed trace in COMP of the embedded clause in (112) is in effect redundant, because the variable is directly bound by its antecedent (= accessible SUBJECT) in a higher domain. Consequently, if there is no co-indexed trace, there could be no successive cyclic wh-movement in (112). The implication is therefore that the governing category for a variable determines whether the relevant wh-movement is successive cyclic or not: if a variable is locally bound, the relevant wh-movement is successive cyclic; if it is not, the wh-movement need not be successive cyclic. To illustrate this further, consider the following

examples in English:

- (113)a.  $who_i$  do you think [  $t_i$  [  $t_i$  AGR left]]
- b. \* $who_i$  do you think [  $t_i$  that [  $t_i$  AGR left]]
- c.  $who_i$  do you AGR think [  $t_i$  [John saw  $t_i$  ]]
- d. [ $who_i$  do you AGR think [  $t_i$  that [John saw  $t_i$  ]]]

For the variable in (113a), it has to be locally bound (because English obeys the NIC). Thus, the COMP of the embedded clause has to be empty to allow a co-indexed trace to bind the variable. But if the COMP is filled as in (113b), the co-indexed trace fails to bind the variable, hence the ungrammaticality of (113b). The variable is locally bound, so that the wh-movement is successive-cyclic. Consider further (113c-d), in which the variable appears to be able to be bound either locally or not locally. In (113c), the variable is locally bound by the co-indexed trace, but is unable to be so bound in (113d) because of the presence of the complementiser. This latter result, however, has no ill-formed effect, because the NIC is irrelevant to [NP, VP] position. Again, the variable is locally bound in (113c) so that the wh-movement is successive cyclic; but the variable is not locally bound in (113d), therefore, the wh-movement need not be successive cyclic. Besides, (113a-d) also show that cyclicity of wh-movement may be conditional upon the absence of complementiser(s).

To sum up, a variable in [NP, S/VP] position in Chinese need not be locally  $\bar{A}$ -bound in generalised binding. This also suggests that there may not be successive cyclicity of wh-movement in these cases.

Finally, according to Aoun (1984, 1986), a variable in an adjunct position obeys the specified subject condition (SSC) (see 1.1), so that it has to be locally bound. I shall test this case with data of wh-quantifiers in 4.4.2.

### 2.4.3 Pronominals

In 2.4.1.1, we have seen that an anaphor must contain a binder (= accessible SUBJECT) in its governing category. Thus, to satisfy Binding Condition B that a pronominal must be free in its governing category, this means that a pronominal must not have a binder in its governing category. E.g.

(114) [<sub>s</sub> Lisi<sub>i</sub> xihuan ta<sub>j</sub> ]/\*[<sub>s</sub> Lisi<sub>i</sub> xihuan ta<sub>i</sub> ]

... like 3sg

- Lisi likes him.

Moreover, we have also seen in 2.4.1.1 that the antecedent of an anaphor acts as a SUBJECT in Chinese. How does this work in the case of pronominals? Consider:

(115)a. [<sub>s</sub> Lisi<sub>i</sub> shuo [<sub>s</sub>.[<sub>s</sub> ta<sub>j</sub> qu]]]

... say 3sg go

- Lisi says that he (not Lisi) will go.

b. [<sub>s</sub> Lisi<sub>i</sub> shuo [<sub>s</sub>.[<sub>s</sub> ta<sub>i</sub> qu]]]

... say 3sg go

- Lisi says that he will go.

In (115a), it appears that either the matrix or the embedded clause could be the governing category for the pronominal, as neither domain contains a binder of the pronominal, which is disjoint in reference with the subject of the matrix clause. In (115b), however, in which the pronominal is co-indexed with and c-commanded by the subject of the matrix clause, the only way for the pronominal to be free is to take the embedded clause, in which it does not have a binder, as its governing category. Returning to (115a), we may thus decide in agreement with (115b) that the embedded clause, not the matrix clause, should be taken

as the governing category for the pronominal. So, the governing category for a pronominal in Chinese need not contain a SUBJECT (= antecedent) (cf. Aoun, 1986).

If we consider (114) further, the principle that (114-115) demonstrate is that in Chinese the minimal clause in which a pronominal occurs must at the same time be the governing category for the pronominal.

In the following, I shall briefly examine [pro, S] (in relation to binding) and pronominals in NPs.

[pro, S] as an empty pronominal should be subject to Condition B. Consider the following discourse:

(116) A: Lisi qu-bu-qu?

... go-not-go

- Will Lisi go or not?

B: Wangwu shuo [(ta) yao qu]

... say (3sg) want go

- Wangwu said that he (= Lisi) would go.

As we see, [NP(+p), S] of the embedded clause in (116B) is optional, suggesting that when it is missing, it is a [pro, S]. Apparently, this [pro, S] is disjoint in reference with the subject of the matrix clause, because its reference is determined by the context. In other words, [pro, S] in (116) identifies with its overt counterpart, the pronominal 'ta' (he).

Another case in which the reference of [pro, S] is also determined by the context is as follows:

(117) A: Lisi chi-le ma?

... eat asp c.p

- Has Lisi eaten?

B: [(ta) chi-le]

eat asp

- He has eaten.

Again, if 'ta'(he) in (117B) is missing, it is a [pro, S] <14>. Thus, we have seen one more case in which [pro, S] identifies with its overt counterpart.

Now, consider the following:

(118) Lisi<sub>i</sub> shuo [(ta)<sub>i</sub> yao qu] (cf. 116B)

... say want go

- Lisi said that he (= Lisi) would go.

There will be a [pro, S] in (118) when 'ta'(he) is missing. The [pro, S] will be coreferential with the subject of the matrix clause, just as its overt counterpart is (see also (115b)). Yet again, [pro, S] identifies with its overt counterpart.

Thus, we have seen in (116-118) that [pro, S] identifies with every single case of overt pronominals. This means that [pro, S] is also subject to Condition B, viz. the minimal clause in which a [pro, S] occurs is the governing category for this [pro, S], as (116-118) demonstrate.

In 2.2.3 and 2.4.1.1, we saw that [pro, S] of an embedded clause has to be identified by (= coreferential with) the subject of a superordinate clause. But we have seen in (116) that this does not have to be so if (and only if) the [pro, S] can be identified by a NP in the context. For this latter result, the context has to be available. However, no matter by which NP a [pro, S] is identified, one in a superordinate clause or one in the context, the fact that it has to be identified by a (nearby) NP is, as stated in 2.2.1, the prime condition under which pro-drop occurs in Chinese, which does not have AGR.

Finally, let us look at pronominals in NPs. (I am not concerned with the complementary distribution or the break-down of such distribution between anaphors and pronominals in NPs. For discussions on this topic, see Chomsky (1982, 1986a) and Huang (1982b).)

Consider the following, in which the brackets represent a NP:

(119)a. Lisi<sub>i</sub> xihuan [<sub>NP</sub> ta<sub>i/j</sub> -de che ]

... like 3sg 's car

- Lisi likes his car.

( 'Lisi' and 'his' may or may not be in coreference.)

b. Lisi<sub>i</sub> shuo [<sub>NP</sub> ta<sub>i/j</sub> -de che] bu hao

... say 3sg 's car not good

- Lisi says that his car is not good.

( 'Lisi' and 'his' may or may not be in coreference.)

c. Lisi<sub>i</sub> shuo Wangwu<sub>j</sub> xihuan [<sub>NP</sub> ta<sub>i/j</sub> -de che ]

... say ... like 3sg 's car

- Lisi says that Wangwu likes his (= Lisi) car.

- Lisi says that Wangwu likes his (= Wangwu) car.

In order to be free, [NP(+p), NP] in each case of (119) has to take the NP in which it occurs as its governing category. This is because in each case the [NP(+p), NP] can be coreferential with a NP in a higher domain. In order not to be bound by that coreferential NP, the NP which contains the [NP(+p), NP] has to serve as the governing category for this [NP(+p), NP].

To summarise, the governing category for a [NP(+p), S/NP] in Chinese is the very S or NP that contains that [NP(+p), S/NP].

Notes:

- <1> In Chomsky (1986b:28, 220), a 'root clause' is defined as the governing category for an anaphor. In this thesis, I shall adopt Aoun's (1984, 1986) generalised binding framework, in which the term 'root clause' is used against that of a 'minimal clause', namely, while the former refers to a S', the latter is a bare S.
- <2> Huang (1982b) gives a tense marker 'hui'(can/will). But as 'hui' is the only possible tense marker in Chinese, and as it in fact expresses modality, I include it in the class of modals, as other authors have done (see Ding et al, 1964; Lu et al, 1979; Hu et al, 1981; Zhu, 1984; etc.).
- <3> As stated in 1.2, the syntax of subcategorised constituents (complements) vs. non-subcategorised constituents (modifiers/adjuncts) is a highly complex one, and has not yet been fully investigated in GB. The reader may refer to the more recent findings in Sag and Pollard (1987) and in Huddleston (1988).
- <4> Although CD was widely assumed in transformational grammar, it has been under some criticism by grammarians adopting non-transformational approaches. E.g. Gazdar (1982:145) thinks that CD is a convenient way of getting away with the issue of context-sensitive subcategorisation in TG. However, I employ CD in the present study only as a means of determining constituent structure and issues beyond this do not concern me.
- <5> C. Ross (1984) uses the term "postverbal adverbial clause constructions", to which I prefer Chao's (1968) term, because the clause concerned is a complement to the verb, and adopting Chao's (1968) term also enables us to distinguish this type of complement clause

from those which do not follow 'De' (see 8.1).

<6> See the section 2.4. .3 for conditions under which [pro, S] may not be identified by the subject of a superordinate clause.

<7> Koopman (1984:129) mentions a point made by Chomsky (personal communication to Koopman (1984)), that an alternative to the assumption that  $\theta$ -marking follows the head-initial/final parameter is that  $\theta$ -marking is not under any direction at all. Koopman (1984) disfavours this idea because it is inconsistent with the notion that D-structure should be maintained as an independent level of grammatical representation. I agree with Koopman (1984), because lexical projections at D-structure, though not yet phonetically realised, have to be in a certain order, which is then directional; furthermore, if D-structure represents the grammatical relations between lexical items, as is generally assumed (e.g. Horrocks, 1987: 150), a directionalised word order (not in the phonetic sense) has to be maintained at D-structure.

<8> There are cases where the POSS-marker 'De' is optional with a genitive NP in Chinese. But these cases involve a different structure from the one where 'De' is obligatory, which we discuss here. See the section 2.4.1.2 for discussion of genitive NPs with an optional POSS-marker.

<9> One analysis might be that the passive marker is subcategorised and then deletable at S-structure. This appears plausible as the deletion complies with the recoverability condition in general (Chomsky and Lasnik, 1977). But, as there are cases where the passive marker is obligatory (see 3.3), the analysis of deletion becomes context-sensitive. For this reason, it seems more satisfactory to take the occurrence of a passive marker as the

result of a syntactic operation, e.g. it is inserted into D-structure, triggered by, for example, movement of [NP, VP] into [np, S] position. See 3.3 for detailed discussion of passive marker insertion.

<10> See footnote <3> of chapter 1 and 3.5.

<11> (62e) is acceptable if 'gei' means *for*(benefactive) rather than *to* (dative). E.g.

(i) wo [gei ta] huan qian  
P NP1 V NP2  
I for 3sg return money

- I return money for him (on his behalf).

In fact, only a few verbs in Chinese permit a preverbal dative PP (= GEI-NP). In those cases, an ambiguity arises because the preposition GEI can be also used as a benefactive marker, which occurs preverbally only. E.g.

(ii)a. wo [gei ta] ji qian  
P NP1 V NP2  
I to/for 3sg post money

- I remit money to him.

- I remit money for him.

b. wo ji qian [gei ta]  
V NP2 P NP1  
I post money to 3sg

- I remit money to him.

(iii)a. wo [gei ta] xie xin  
P NP1 V NP2  
I to/for 3sg write letter

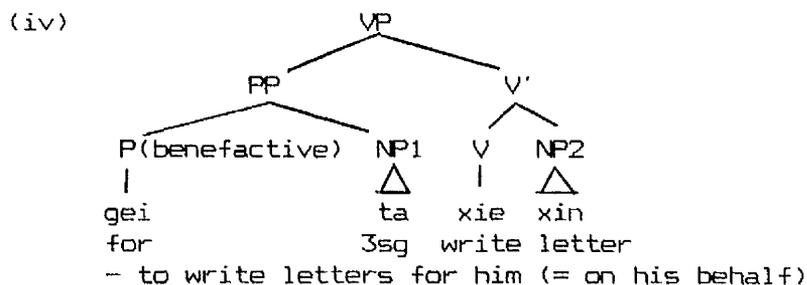
- I write to him.

- I write letters for him.

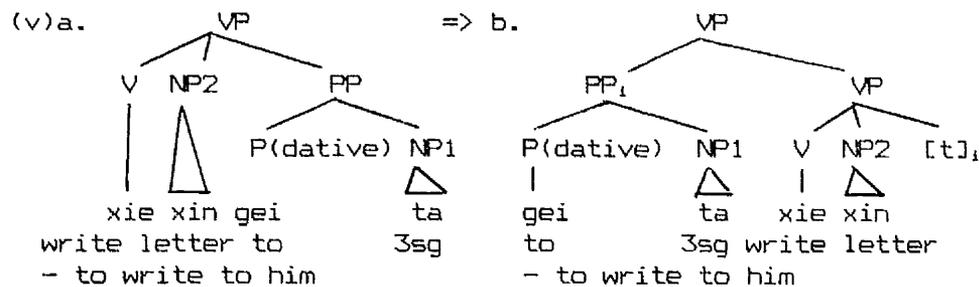
b. wo xie xin [gei ta]  
V NP2 P NP1  
I write letter to 3sg

- I write to him.

It is argued in He (1987) that the predicate of those sentences in (i-iii) containing a benefactive PP represents the following (modifier) structure:

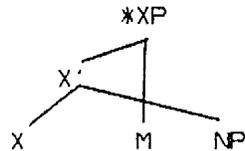


And the predicate of those containing a dative PP represents the following (complement) structure:



(v)a represents the cases where the dative PP is postverbal, and (v)b those where the dative PP is preverbal. The ambiguity we see in (ii-iii) is thus accounted for by the structural contrast between (iv) and (v)b. The PP-shift in (v)b is further justified by the fact discovered in He (1987) that (v)b has the same constituent structure as (iv) does.

<12> Whether or not a language complies with Case-adjacency presumably depends on whether that language is configurational (in the sense that while a configurational language conforms to a certain structural hierarchy, e.g. X-bar theory, a non-configurational language does not), since the so-called violation of Case-adjacency in (81a-c) is due to the structural disorder as follows:



However, X-M-NP (M = modifier) is allowed in a non-configurational language, e.g. Japanese, in which the adjacency problem is solved by employing a topic/subject/object marker suffixed to, thus Case-marking, a relevant NP (Kato, 1989:28-44). It therefore seems to me that the parameter of Case-adjacency has a greater explanatory value than the traditional peripherality analysis, which accounts for the string \*X-M-NP by stating that peripheral elements such as modifiers cannot intervene between the head and a non-peripheral element like an object. This analysis, though feasible to the string \*X-M-NP from Chinese - a configurational language, will fail to capture the well-formed string X-M-NP in a non-configurational language.

- <13> Ditransitive verbs in Chinese are classified into several groups, of which only one group allows the V-NP1-(POSS)-NP2 construction (cf. Zhu, 1984; Tang, 1985c; He, 1987).
- <14> Huang (1982b) treated (116B) as a case of empty operator movement akin to that in a purpose clause that contains an obligatory empty object (Chomsky, 1980; also see 6.4). But, as Aoun (1986:45-48) points out, Huang's (1982b) analysis results from the view that the governing category for a pronominal contains a SUBJECT. In the present study, I, following Aoun (1986), dismiss this.

<15> (9a) can be alternatively treated as a nominal compound, since *De*-insertion results in a change of entailment, as in (9b). (A similar contrast is found in (6a-b) and (10a-b)). However, in cases where *De*-insertion does not alter entailment of an A-N, as in:

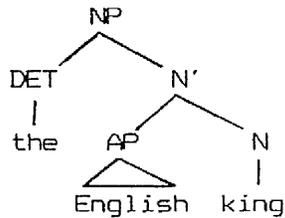
- (i)a. bai (de) gou  
    A      N  
    white dog  
      - white dog(s)
- b. da (de) fangzi  
       A      N  
       big house  
       - big house(s)
- c. gao (de) shan  
       A      N  
       high mountain  
       - high mountain(s)
- d. congming (de) ren  
       A          N  
       clever people  
       - clever person(s)

it seems still necessary to opt for the complement vs. modifier analyses in (9a-b) in order to account for the contrast in word order between A-de-A-N and \*A-A-de-N illustrated in (7-8).

The problem with (9a) is, however, lack of apparent s-selection between the complement AP and the head N. Two solutions to this are: a) to treat all APs in Chinese, either in the form of A or A-de, uniformly as a modifier, or b) to treat a complement AP as a pseudo-argument (following the notion of "quasi-argument" in Chomsky (1986b:325ff)). The first approach is hardly satisfactory, as it will fail to explain the contrast between A-de-A-N and \*A-A-de-N. The second approach, though obscure of its theoretical

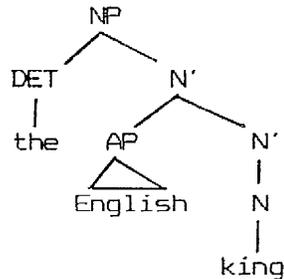
status, is practically plausible. Compare (9a-b) with the following English example (Radford, 1981:96):

(ii)a.



(= the king of England)

b.



(= the king who is English)

Similar to (9a), there is no apparent s-selection between the complement AP and the head N in (ii)a. However, the structural difference between (ii)a and (ii)b, as it is between (9a) and (9b), seems to capture the semantic contrast they display.

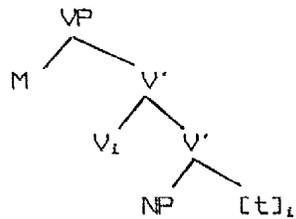
<16> Pending further research, the claim that INFL in Chinese is nominal rests ultimately on independent evidence from the language. As Chinese does not contain AGR, the identifying of INFL as nominal in this language is likely related to syntactic rather than morphological evidence. One approach may be to study the way in which [NP, S] relates itself to the verb in syntactic processes like imperativisation, reflexivisation, pronominalisation, verb-serialisation, and so on, so as to filter any relevant features. Because of its complexity, the issue will remain, in my view, under scrutiny for some time to come before we fully understand it.

<17> There are further two issues that need to be noted concerning the V-movement in (60). Firstly, what is the formal status of X<sup>0</sup>-adjunction to XP? According to the theory of movement (Chomsky, *Barriers*, MIT, 1986:4-6), only X<sup>0</sup> and XP can move: X<sup>0</sup>-substitution to a head position, and XP-substitution to a SPEC position and adjunction to a (non-argument) XP position. It is left unspecified

whether  $X^0$  can adjoin to a (non-argument) XP position. In my view, such an option should be included in the theory, as I believe that there is empirical motivation for it, such as what I have argued for in (60) in Chinese.

Secondly, if a VP contains a modifier, the V-adjunction to VP in (60) will have to be to  $V'$  instead, as in:

(i)



The problem with (i) is that, as stated above, adjunction is normally taken to a (non-argument) XP position. Nevertheless, as  $V'$  qualifies as a non-argument position, (i) does not seem to result in any other undesirable effect.

### Chapter 3 BA and BEI Constructions

When examining  $\theta$ - and Case-marking in VPs in 2.3.2, I mentioned BA-insertion and BEI (passivising) sentences. In this chapter, I discuss in detail BA and BEI positions in related constructions.

#### 3.1 Introduction

BA and BEI are both prepositions, with BEI being able to take an optional object. E.g.

(1)a. wo [ba fangzi] mai-le.  
P NP V  
I ob.m house sell-asp

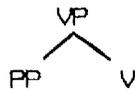
- I sold the house.

b. fangzi [bei (wo)] mai-le.  
P NP V  
house p.m me sell-asp

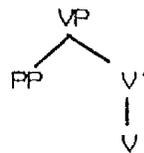
- The house was sold (by me).

For (1), the basic issue prior to any others is what position the PP (= BA/BEI-NP) holds in relation to the verb. Is the PP a sister to the verb or to the V', as in (2a) or (2b)?

(2)a.



b.



(2a) means that the verb subcategorises for the PP, which may then be an obligatory constituent (cf. Hornstein and Lightfoot, 1981; Radford, 1981). Consider:

(3)a. wo [ba shu] huan-le.  
PP  
I ob.m book return-asp

- I returned the book.

b. \*wo huan-le.

I return-asp

(4)a. wo [bei ta] pian-le  
PP

I p.m 3sg cheat-asp

- I was cheated by her/him.

b. \*wo pian-le.

I cheat-asp

The PP (= BA/BEI-NP) in (3-4) seems obligatory, and this appears to be in favour of the structure in (2a).

However, one major factor we should not overlook is that the verbs in (3-4) are transitive. This means that the ungrammaticality in (3b) and (4b) is not necessarily a result of the missing PP, but can be caused by a missing object, because, as they are, (3b) and (4b) may simply be lacking an object, as in:

(5)a. Wo huan-le shu. (cf. (3b))

I return-asp book

- I returned the book.

b. Wo pian-le ta. (cf. (4b))

I cheat-asp 3sg

- I cheated her/him.

Given (5), it seems that the ungrammaticality in (3b) and (4b) may arise either from (3a) and (4a) or from (5a-b). Thus, it is not appropriate to draw a conclusion based merely on (3a) and (4a) that the PP (BA/BEI-NP) in these sentences is a sister to the verb, as in (2a).

In fact, a BEI phrase is optional in some cases. Compare (1b) with (6) below:

(6) Fangzi mai-le.

house sell-asp

- The house was sold.

Thus, we should rely on other facts to determine the structural position of a BA/BEI phrase in relation to the verb, and return to the obligatoriness of a BA phrase and a BEI phrase in some later cases.

One piece of evidence for a BA/BEI phrase being a sister to the V' in (2b) is derived from coordination deletion (CD). Consider the following BA/BEI sentences containing a postverbal PP:

(8)a. Ta ba shu huan gei wo, ba bao huan gei wo.

3sg ob.m book return to me ob.m newspaper return to me

- He returns the books and newspapers to me.

b. \*Ta ba shu huan \_\_, ba bao huan gei wo.

3sg ob.m book return ob.m newspaper return to me

c. Ta ba shu \_\_ \_\_, ba bao huan gei wo.

3sg ob.m book ob.m newspaper return to me

- He returns the books and newspapers to me.

(9)a. Shu bei wo reng zai di-shang, bei ta reng zai di-shang.

book p.m me throw at ground-on p.m 3sg throw at ground-on

- The books were thrown onto the ground by me and by him.

b. \*Shu bei wo reng \_\_, bei ta reng zai di-shang.

book p.m me throw p.m 3sg throw at ground-on

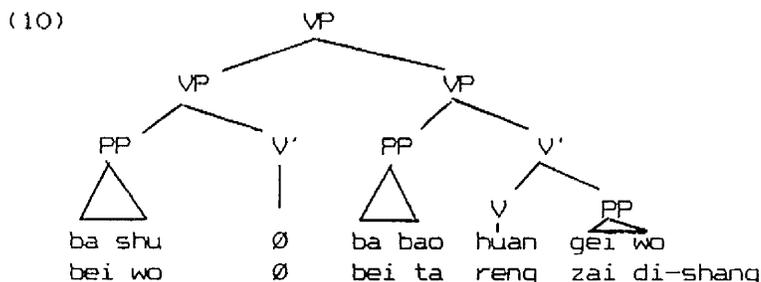
c. Shu bei wo \_\_ \_\_, bei ta reng zai di-shang.

book p.m me p.m 3sg throw at ground-on

- The books were thrown onto the ground by me and by him.

The postverbal PP (GEI/ZAI-NP) in (8-9) is not deletable unless deleted together with the preceding verb, suggesting that the sequence V-PP is of one constituent, which must be a V' as it is within a VP. Thus, we

may have the following structure showing the deletion in (8c) and (9c):



Apparently, (10) observes the structure in (2b), i.e. the PP (BA/BEI-NP) is a sister to V'.

Another piece of evidence for the PP (= BA/BEI-NP) being a sister to V' comes from the fact that additional elements such as PPs may intervene between the PP (BA/BEI-NP) and the verb, as in:

(11)a. wo [ba maozi] xi-le.

PP      V  
I ob.m hat wash asp

- I washed the hat. \*

b. wo [ba maozi] [gei ni] xi-le.

PP      PP      V  
I ob.m hat for you wash asp

- I washed the hat for you.

c. wo [ba maozi] [cong jia-li] [gei ni] na-lai-le.

PP      PP      PP      V  
I ob.m hat from home-in for you bring-come-asp

- I have brought the hat for you from home.

(12)a. yifu [bei wo] reng-le.

PP      V  
clothes p.m me throw asp

- The clothes were thrown away by me.

b. yifu [bei wo] [gei ni] reng-le.

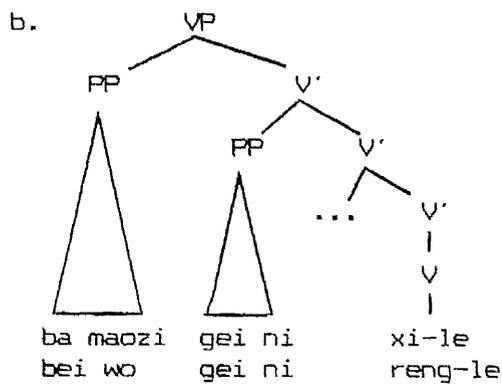
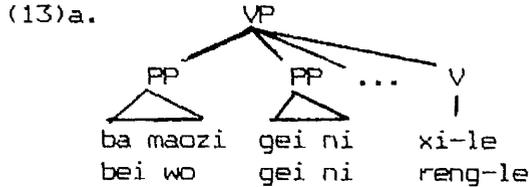
PP      PP      V  
clothes p.m me for you throw asp

- The clothes were thrown away by me for you.

c. yifu [bei wo] [cong jia-li] [gei ni] na-lai-le.  
 clothes p.m me from home-in for you bring-come-asp

- The clothes have been brought by me for you from home.

If the PP (BA/BEI-NP) in (11-12) is a sister to the verb, we would have the structure in (13a), but (13b) if the PP (BA/BEI-NP) is a sister to V':



In (13b), the categorial rule  $V' \rightarrow PP V'$  is recursive as the head has more than one modifier (cf. Andrews, 1983).

(13a) is not satisfactory, because there is no evidence that any Chinese verb subcategorises for a number of adverbial constituents (cf. C. Ross, 1984; He, 1987), and because it wrongly predicts that the V is deletable - being peripheral and immediately dominated by a potential conjunct. To illustrate this, consider:

(14)a. Wo ba maozi gei ni xi-le, ba wazi gei ni xi-le.

I ob.m hat for you wash asp ob.m socks for you wash asp

- I washed the hat and the socks for you.

b. \*Wo ba maozi gei ni \_\_\_\_, ba wazi gei ni xi-le.

I ob.m hat for you ob.m socks for you wash asp

c. Wo ba maozi \_\_ \_\_, ba wazi gei ni xi-le.

I ob.m hat ob.m socks for you wash asp  
 - I washed the hat and the socks for you.

(15)a. Yifu bei wo gei ni reng-le, bei ta gei ni reng-le.

clothes p.m me for you throw asp p.m 3sg for you throw asp  
 - The clothes were thrown away by me and him for you.

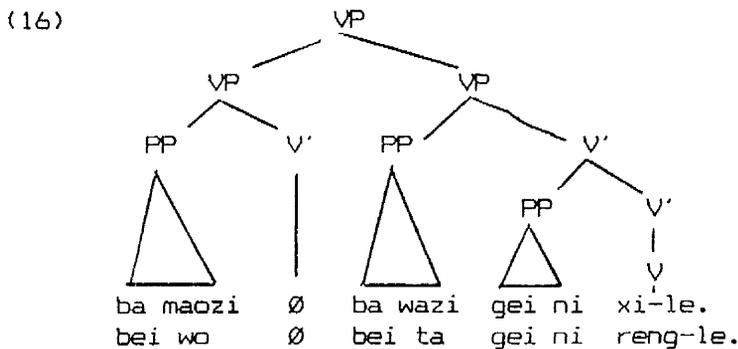
b. \*Yifu bei wo gei ni \_\_, bei ta gei wo reng-le.

clothes p.m me for you p.m 3sg for me throw asp

c. Yifu bei wo \_\_ \_\_, bei ta gei ni reng-le.

clothes p.m me for you throw asp p.m 3sg for you throw asp  
 - The clothes were thrown away by me and him for you.

The fact that the peripheral, identical verb in (14b) and (15b) does not delete indicates that this verb is not immediately dominated by the conjunct, so that the structure in (13a) is not valid. Furthermore, as this verb deletes together with the preceding PP (= GEI-NP), as shown in (14c) and (15c), this suggests that the sequence PP-V is of one constituent immediately dominated by the conjunct, as illustrated in:



(16) further supports the structure in (13b).

Based on the evidence given in the above, we may thus conclude that the structure in (2b) in which the PP (= BA/BEI-NP) is a sister to V' is preferable to that in (2a) in which the PP is a sister to the verb.

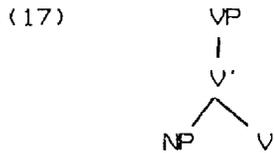
Now we may return to the issue of the obligatory presence of a BA phrase (see (3b)) in BA sentences, and of a BEI phrase in some passive sentences (see (4b), (1b) and (6)). I shall examine them in turn in the following sections.

### 3.2 BA-insertion

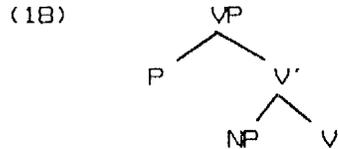
The fact that a BA phrase is obligatory but at the same time unlikely to be a subcategorised constituent of any verb indicates that there is a transformation involved. This transformation is called BA-insertion, referring to the process in which BA is inserted at S-structure to assign Case to [NP, VP], because Chinese is head-final (Koopman, 1984; Travis, 1984; Williams, 1984b; Sells, 1985; A. Li, 1985; Huang, 1982b, 1988; Aoun and A. Li, 1989). The empirical basis for BA-insertion is that BA so often takes the object of a transitive verb (see (1a) and (3a)), and this is exactly the reason why the PP (= BA-NP) is obligatory in a BA sentence; because if BA-NP is missing, the verb has no object, hence the ungrammaticality (see (3b)). Thus it is in fact not BA but rather its object (= the object of a verb) that is obligatory, because when the verb has its object, as in (5a), there is neither ill-formedness nor the presence of BA.

Although BA-insertion is widely assumed in the literature, little has been said about the actual process of this transformation, which I examine in this section.

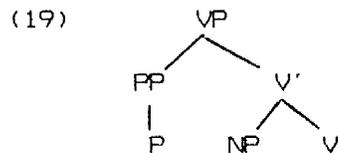
Consider a maximally-projected VP containing a verb and its object in:



When BA-insertion takes place, it has to be at the level of VP or V', since BA is not subcategorised by the verb, i.e. it is not a complement to the verb. Assuming that the insertion happens at the level of V', e.g. BA (= P) sister-adjoins to the V' on its left, we then may have:



(18), however, is certainly not adequate because the P as a head-of-phrase category cannot occur in a VP, in which the V is the head. Thus, we have:



(19) is still inadequate because the P cannot govern, thus is unable to Case-mark, the NP, as the PP stands as a barrier to government (see (6-8) of 1.1). To solve this problem, I hereby refer to the theorem called  $\bar{A}$ -transparency (van Riemsdijk and Williams, 1985).

$\bar{A}$ -transparency refers to a situation in which an  $\bar{A}$ -position as a maximal projection becomes a non-maximal projection, so that it is no longer a barrier to government. E.g. it is suggested in Chomsky (1986b: 173) that S'-deletion in raising (see (29) of 2.2.2.2) could be instead a process of S'-transparency, which changes S' into S. Another example is given by van Riemsdijk and Williams (1985:298), who, using Dutch as data, suggest that a PP node becomes transparent when it is "closely linked to the verb". By "closely linked to the verb", van Riemsdijk and

Williams mean that the PP concerned is either a complement to the verb, or acting as an instrumental adverbial.

In the case of (19), the PP (= BA-NP) is not a complement to the verb. But, incidentally, BA has been regarded as an instrumental marker in classical and pre-modern Chinese by many authors (see J. Li, 1924; L. Wang, 1943, 1944; Lu, 1944, 1952; M. Zhu, 1957; H. Wang, 1959; Chao, 1948, 1968; Hu et al, 1981; D. Zhu, 1984). In fact, it was L. Wang (1943, 1944) who first proposed that BA sentences in modern Chinese inherited a meaning of "disposing the object of a verb", and claimed that this was the instrumental use of BA in modern Chinese.

In modern Chinese, BA is semantically inert, but its instrumental function has not totally disappeared. In some cases, BA is preferred when the verb has postverbal constituents, e.g.

(20)a. Ta ba shu fang zai zhuozi-shang.

3sg ob.m book put at table-on

- S/He put the book on the table.

b. ??Ta fang shu zai zhuozi-shang.

3sg put book at table-on

(21)a. Wo ba tang liu gei ta he.

I ob.m soup leave for 3sg drink

- I leave the soup for him to drink.

b. ?Wo liu tang gei ta he.

I leave soup for 3sg drink

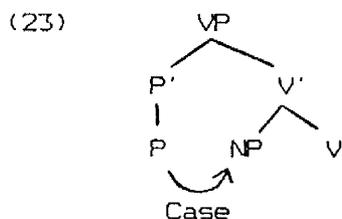
Presumably, the verbs in (20-21) project the structure in:

(22) [<sub>VP</sub>[<sub>PP</sub> BA NP][<sub>V</sub> V PP/S']]

Given (22), the preference for BA in (20-21) may be due to the balance

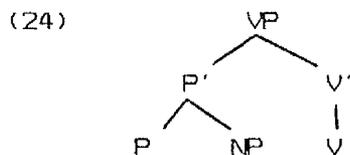
between Case-marked and non-Case-marked complements. That is, when both types of complement co-occur, the former tend to occur preverbally, but the latter postverbally (1). If so, the PP (BA-NP) in (22) is grammatically acting as an instrumental adverbial.

Thus, we may argue that the PP in (19) is "closely linked with the verb", so that the PP is transparent - technically changed into a P'. Given this result, the P' is no longer a barrier to government, so that the P can assign Case to the NP in the V':



### 3.2.1 Restructuring

(23) appears to be adequate except for one last issue. Recall that we have argued in 3.1 that BA-sentences represent the structure in (2a), reproduced in:



which in comparison with (23) puts the NP in the P' instead of V'. Further facts show that BA-NP in a sequence BA-NP-V seem to belong to one single constituent. E.g.

(25)a. Wo ba yifu xi-le, ba yifu yun-le.

I ob.m clothes wash asp ob.m clothes iron asp

- I washed and ironed clothes.

b. \*Wo ba yifu xi-le, \_\_ yifu yun-le.

I ob.m clothes wash asp clothes iron asp

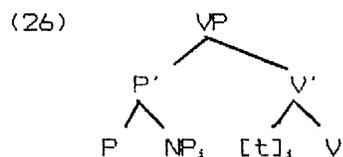
c. Wo ba yifu xi-le, \_\_ \_\_ yun-le.

I ob.m clothes wash asp iron asp

- I washed and ironed clothes.

In (25), BA, though peripheral, does not delete, suggesting that it is not immediately dominated by the conjunct; more importantly, BA has to be deleted together with the following NP. This indicates that BA-NP is a single constituent (= P' in (24)).

One way of mapping (23) onto (24) is to assume that the NP has moved out of the V' into the P', such as in:



But (26) is defective in several ways. Firstly, such movement is too opaque to be empirically tested ("opaque" means that there is no additional element between the launching and the landing sites of the movement). Secondly, under the structure of (24), the NP can get Case from the P; so, there is no reason for movement. Thirdly, other cases similar to (24) also show that movement is not feasible. For instance, it seems universal that languages have prepositional complementisers. Consider the examples of English and of Chinese below:

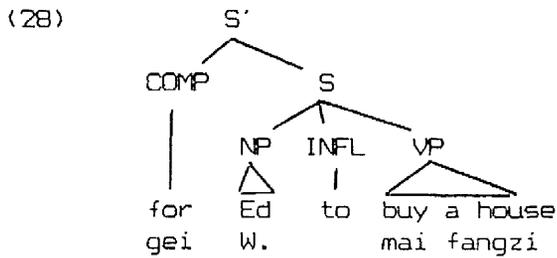
(27)a. John borrows money [for [Ed to buy a house]]

b. Lisi jie qian [gei [Wangwu mai fangzi]]

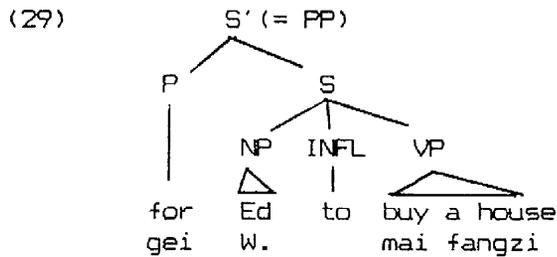
... borrow money for ... buy house

- Lisi borrows money for Wangwu to buy a house.

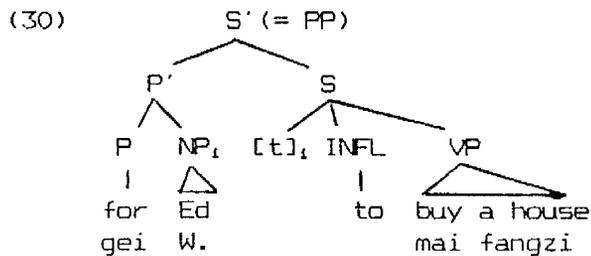
Further details showing the structure of the relevant part of (27) are:



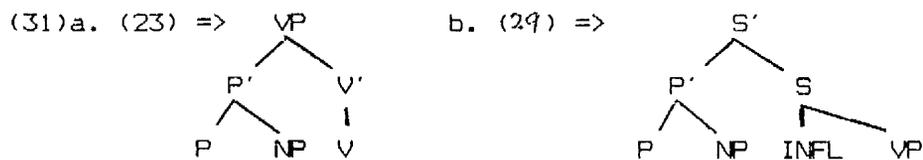
Although *for*/*'gei'* (for) is under COMP in (28), it can be alternatively analysed as follows (cf. Emonds, 1985):



Furthermore, we can show that the P and the [NP, S] in (29) are in fact within one single constituent, i.e. [<sub>PP</sub> P NP] (data showing this are omitted here). Thus, (29) is, in effect the same as (23). Similarly, however, it is difficult to prove an opaque movement such as in:



In order to solve the problem in (23) or in (29) alike, I propose that instead of Move  $\alpha$ , there is restructuring between the P' node and the NP in the V' in (23), and between the P node and the NP in the S in (29). That is:



If the restructuring in (31) is correct, as I believe it is, structures

like (23) and (29) or of similar nature are thus accounted for with respect to the fact that a NP complement of a head-of-phrase category may be at the same time a member of another argument structure. This argument structure in question is the VP in (31a) and the S in (31b). In my view, the so-called restructuring phenomenon (Rizzi, 1978; Weinberg and Hornstein, 1978; Rouveret and Vergnaud, 1980; Burzio, 1981; Chomsky, 1986b) is better understood along the lines expressed above. For example, it is said that restructuring applies to the following in English (cf. Radford, 1981:136-138, 346-348):

- (32)a. to speak [to NP]                   => to speak-to NP  
       b. to talk [about NP]               => to talk-about NP  
       c. to take advantage [of NP] => to take-advantage-of NP

It should be obvious in English that the NP in each case in (32) is a complement of the related preposition and at the same time an argument to the verb. Thus, though different from each other in the way they are restructured, (32) and (31) are of similar nature.

Having argued that restructuring instead of Move  $\alpha$  applies in BA-insertion, let us examine two seeming counterexamples. Consider:

- (33)a. wo ba yifu [gei ni]/[hen kuai] xi-le.  
       BA NP       PP       ADVP       V  
       I ob.m clothes for you/quickly wash-asp  
       - I washed the clothes for you/quickly.
- b. tamen ba fan [dou] chi-wan-le.  
           BA NP       ADVP       V  
       they ob.m food all eat-finish asp  
       - They ate up all the food.

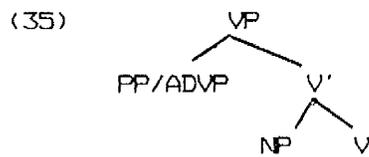
In (33), there is a PP or an ADVP intervening between BA-NP and the verb, so that restructuring does not seem to be possible in these cases.

However, on close examination, we find that this is not so.

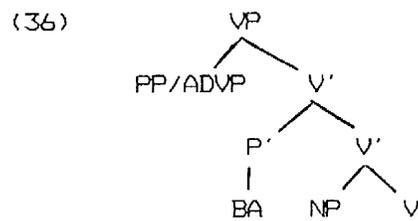
Let us look at (33a) first, which in fact can have the alternative surface form as in:

- (34) wo [gei ni]/[hen kuai] ba yifu xi-le.  
 PP ADVP BA NP V  
 I for you/quickly ob.m clothes wash-asp  
 - I washed the clothes for you/quickly.

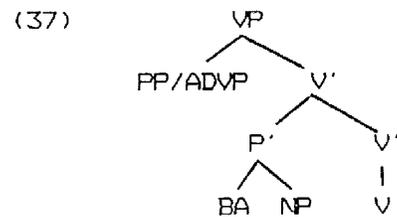
Therefore, (33a) can be a derivation of (34). As demonstrated in the footnote <1j> of chapter 2, a VP containing a benefactive PP represents the following structure before BA-insertion:



Applying BA-insertion, we have:

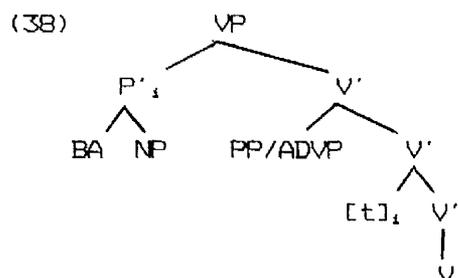


After restructuring, we reach:



(37) represents the surface form of (34), from which (33a) is derived.

The derivation in question is presumably achieved by moving the P' (= BA-NP) to a position before the benefactive PP, as in:



The P'-movement in (38) thus represents a P'-extraposition. The reason why such a P'-extraposition is possible is that both the P' and the PP/ADVP are in a modifier position in relation to the head, and an interchangeable word order between them is therefore permitted (whereas constituents in a complement position normally do not enjoy such a change in word order; cf. Hornstein and Lightfoot, 1981; Radford, 1981; Sag and Pollard, 1987).

I shall discuss the sentence in (33b) in the following section.

### 3.2.2 Quantificational Phrases (QP)

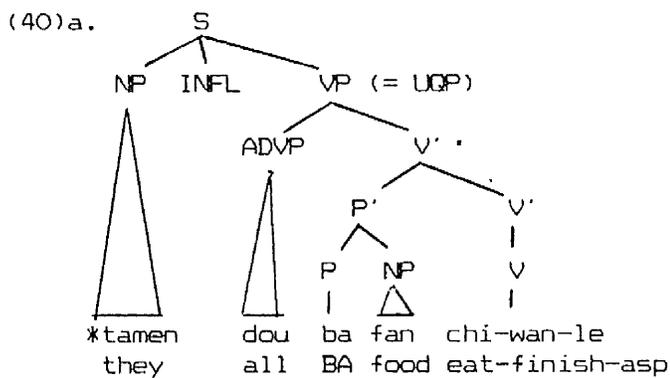
The sentence in (33b) involves an independent principle in Chinese: Move  $\alpha$  out of a universal quantificational phrase (UQP), where  $\alpha$  = a quantified item. I shall investigate this principle in depth in chapter 4, but present only the relevant facts concerning (33b) here.

I have just argued in (37-38) that there is a P'-extraposition in BA sentences like (33a). The fact that there is no change in meaning as the result of P'-extraposition supports this argument (see (33a) and (34)). But if we change the word order of BA-NP-ADVP in (33b) into ADVP-BA-NP, we have:

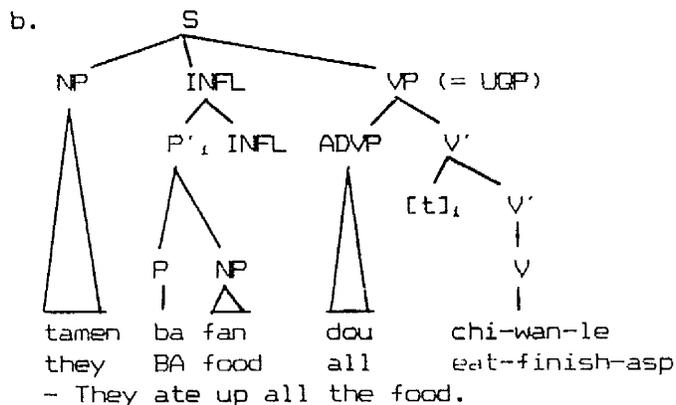
- (39) tamen [dou] ba fan chi-wan-le (cf. 33b)  
 ADVP BA NP V  
 they all ob.m food eat-finish-as  
 - They all finished eating their food.

As we see, the meaning of (39) differs from that of (33b). Why?

The BA phrase in (33b) is in fact not within the VP of the verb, but is believed to be in a category between [NP, S] and [VP, S], presumably in INFL (see 4.3.2). This follows the principle that a UQP must follow the NP it quantifies (this will become apparent as we proceed). In (33b), the VP becomes a UQP by containing the quantifying adverb 'dou' (all), and the UQP quantifies [NP, VP] as we see from the interpretation of (33b). Because a UQP must follow the NP it quantifies, if the NP is within the UQP, it must then move out of the latter. In the case of (33b), [NP, VP] is assigned Case by BA, so the BA phrase moves, as illustrated in:



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Given the analyses in (40), we may now clarify some relevant points one

by one below.

Firstly, as far as restructuring after BA-insertion is concerned, we have seen in (40) that the sentence in (33b) poses no counterexample to restructuring at all. What happens is that the BA phrase moves out of the VP after restructuring, so that in the surface form BA-NP appears before the quantifying adverb 'dou'(all).

Secondly, justifying the analyses in (40), we have seen that the word order at D-structure in (40a) is ungrammatical in respect of the interpretation this sentence is supposed to have. This means that the movement of the BA phrase in (40b) is obligatory, and is attributed to the quantificational construction in which it occurs. As stated in 1.1, movement of a quantificational nature is an operator movement, and syntactic operator movement depends on language-specific conditions, e.g. wh-movement in English vs. wh-in-situ in Chinese. The syntactic operator movement in (40b) in Chinese occurs as a result of the scope of a UQP. The basic principle is, as said earlier, that a UQP must follow the NP it quantifies. As far as (40a) is concerned, this implies that if the scope of the UQP changes, [NP, VP] does not have to move. Indeed, we find that (40a) can be grammatical if it has a different meaning from (40b) (= (33b)). The sentence in question is (39). Repeating both (33b) and (39), we then get a clear idea of the scope of a UQP:

(41)a. tamen ba fan [dou chi-wan-le] (quantifying [NP, VP])  
      BA NP      UQP(= VP)  
      they ob.m food all eat-finish-asp

- They ate up all the food.

b. tamen [dou ba fan chi-wan-le] (quantifying [NP, S])  
      NP          UQP(= VP)  
      they all ob.m food eat-finish-asp

- They all finished eating their food.

In (41), either [NP, VP] or [NP, S] is within the scope of the UQP

identified by the item 'dou'(all).

Clearly, the pattern of a UQP scope is that the UQP identified by 'dou'(all) must follow the NP it quantifies. The contrast in interpretation as well as in word order between (41a) and (41b) evidently supports the analyses in (40) that the P' (= BA-NP) moves out of the UQP in order for [NP, VP] to be quantified. In the case of (41b), [NP, S] instead of [NP, VP] is quantified, so that [NP, VP] within the BA phrase remains after 'dou'(all) (cf. (40a)). The reason for the UQP being a VP in both (41a) and (41b) is that the universal quantifier 'dou'(all) in Chinese is an adverb (I shall not demonstrate this point here; see amongst others Ding et al (1961), Lu et al (1981) and Zhu (1984) for discussion).

Another implication from the scope of the UQP in (41) is that, given its nature of operator movement, [NP, VP] has to move regardless of the presence of BA, provided that it can get Case from somewhere else. We know that [NP, VP] can get Case from its verb (cf. 2.3.2.2). Taking (41b) as an example, if [NP, VP] occurs after the verb, we have:

(42) tamen [dou chi-wan-le fan] (cf. 41b)  
NP UQP(= VP)  
they all eat-finish-asp food

- They all finished eating their food.

Presumably, [NP, VP] in (42) gets Case from the verb. Furthermore, (42) shares the reading with (41b), suggesting that the UQP focuses on [NP, S], so that [NP, VP] does not move. But if the UQP needs to focus on [NP, VP], the latter then has to move, e.g.

(43) tamen fan [dou chi-wan-le] (cf. 41a)  
NP UQP(= VP)  
they food all eat-finish-asp

- They ate up all the food.

The contrast between (42) and (43) is essentially the same as that

between (41b) and (41a), and supports further the operator movement analysis in (40).

Note that because of the existence of (43) as an alternative expression to (41a), or because of the overlapping between (43) and (41a), BA in (41a) becomes redundant, hence optional as shown again in:

(44) tamen (ba) fan [dou chi-wan-le] (quantifying [NP, VP])  
      (BA) NP      UQP(= VP)  
      they (ob.m) food all eat-finish-asp

- They ate up all the food.

In fact, the landing site for [NP, VP] movement out of a UQP can be either in INFL as indicated in (40), or in COMP. For example, compare (44) with (45) below:

(45) fan, tamen [dou chi-wan-le] (quantifying [NP, VP])  
      NP              UQP(= VP)  
      food they all eat-finish-asp

- They ate up all the food.

A separate principle that (45) reveals is that a UQP always quantifies a NP that moves out of that UQP, whether that NP is adjacent to the UQP (e.g. (44)) or not (e.g. (45)). More details of this will be discussed in chapter 4.

### 3.2.3 External Complement

Further data which may involve a GP containing a BA phrase are the following type:

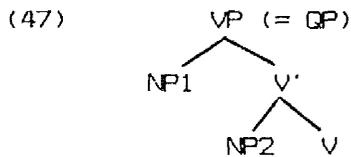
(46)a. Ta ba wuge juzi chi-le sange.  
      BA      NP1      V      NP2  
      3sg ob.m five oranges eat-asp three

- S/He ate three oranges out of five.

- b. Ta ba chuanghu da-le yige dong.  
 BA NP1 V NP2  
 3sg ob.m window hit-asp one hole  
 - S/He broke a hole in the window.
- c. Ta ba fangzi shua-le youqi.  
 BA NP1 V NP2  
 3sg ob.m house brush-asp paint  
 - S/He painted the house.

There are two NPs in each sentence of (46), NP1 is after BA and NP2 after the verb. NP2 is known as the "retained" object (Thompson, 1973; Chu, 1976, 1983).

As Chu (1976, 1983:211) pointed out, the semantic relationship between NP1 and NP2 in sentences like those in (46) is a whole-part relation. To me, this whole-part relation reflects a partial quantification in which one "part" quantifies the "whole". If so, NP2 in each case of (46) can then be regarded as a quantifier and the domain which contains it is a QP, as in:



In (47), NP1 is treated as an external object rather than a sister to NP2, because the verbs in (46) are not ditransitive, i.e. they do not take NP1 and NP2 as direct and indirect objects (cf. ditransitives in 2.3.2.3). But NP1 remains an argument to the verb.

Two separate issues concern (47): Case-assignment and quantification. As they are, neither NP in (47) has Case. Two ways of assigning Case to these NPs would be V-movement across both NP2 and NP1, or BA-insertion to assign Case to NP1 and V-movement to assign Case to NP2. Applying V-movement, the results based on (46a-c) are in (48) (irrelevant details omitted):

(48)a. \*ta [<sub>QP</sub> chi-le [wuge juzi] sange]  
          V          NP1      NP2

b. \*ta [<sub>QP</sub> da-le chuanghu [yige dong]]  
          V          NP1      NP2

c. \*ta [<sub>QP</sub> shua-le fangzi youqi]  
          V          NP1      NP2

To find out the reason why (48a-c) are barred, let us compare (46) and (48) with (49) below:

(49)a. Wo ba Lisi da-le yidun./Wo da-le Lisi yidun.  
      BA NP1 V      NP2      V      NP1 NP2  
      I ob.m ... beat-asp a-while

- I smacked Lisi.

b. Ta ba Zhangsan xia-le yitiao./Ta xia-le Zhangsan yitiao.  
      BA NP1 V      NP2      V      NP1 NP2  
      3sg ob.m ... frighten-asp a-jump

- S/He frightened Zhangsan.

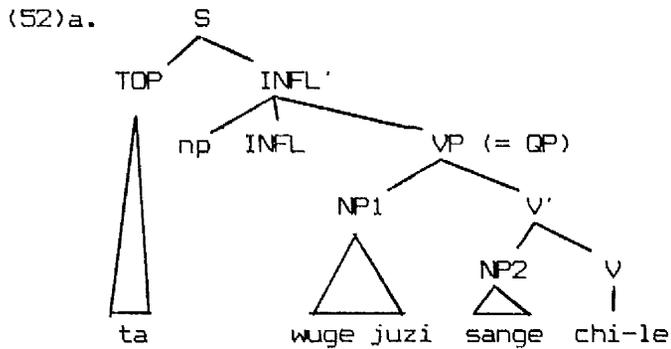
In contrast to (46 + 48), (49) allows both BA-NP1-V-NP2 and V-NP1-NP2. But as we observe in (49), there is no whole-part relationship between NP1 and NP2, as it exists in (46). Therefore, the VP of the verb(s) in (49) cannot be identified as a QP in (47). As a result, V-movement crossing both NP2 and NP1 to assign Case to the NPs yields straightforwardly well-formed strings.

But why does V-movement from (47) in which the VP is a QP not yield well-formed strings, as shown in (48)? Recall that a QP must follow the NP it quantifies (cf. 3.2.2). In (47), as the QP should quantify NP1, this NP, after receiving Case, should occur outside the QP in order to be quantified. Thus the reason why V-NP1-NP2 in (48) is barred is because NP1 still remains in the QP. Suppose that NP1 in (48) moves out of the QP, as in (50) (irrelevant details omitted):

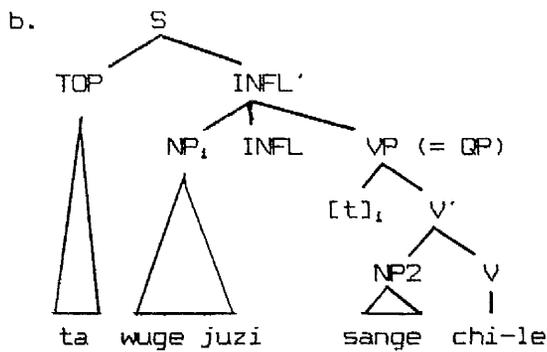


and the other by V-movement, which applies before NP1-movement, because the latter is an operator movement in which NP1 needs Case before it moves, as we see in the contrast between (48) and (50).

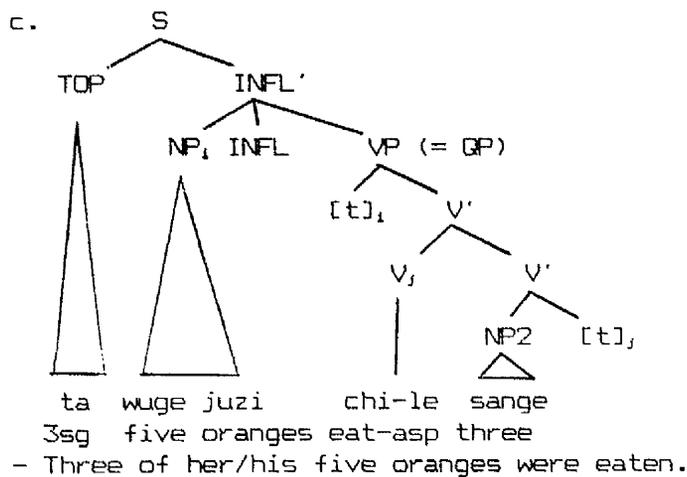
However, if we need to account for the passive reading of the sentences in (50), we would have the following process of derivation:



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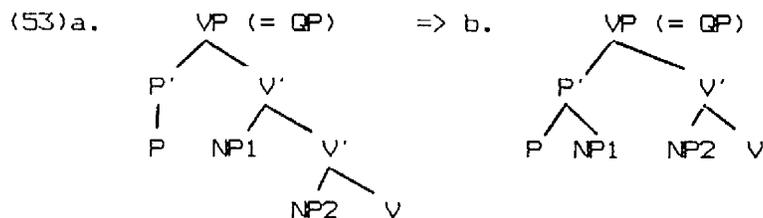


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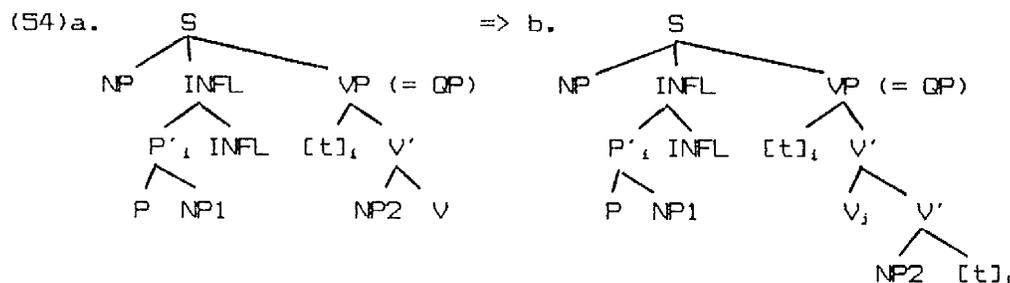


Note that, when (52a) => (52b), NP1 moves into [np, S] position for Case; as a result, the sentence becomes passive and NP1 is out of the QP, i.e. the operator movement is achieved through NP-movement for Case. When (52b) => (52c), the verb moves to assign Case to NP2. Passivisation will be discussed further in the next section.

Now, let us return to the structure in (47) and examine the result of BA-insertion. If BA-insertion instead of V-movement applies, we presumably have (53a), and (53b) after restructuring:



Then the P' (= BA-NP1) should move out of the QP, and V-movement takes place to assign Case to NP2:



The relevant data for the structures in (54) have been shown in (46), and I need not repeat them here apart from mentioning one point.

We have seen that BA-NP1-[V NP2] in (46) and NP1-[V NP2] in (50) are both results of an operator movement (see (54) and (51)). This means that BA in (46) is in effect optional because of the existence of (50), and implies that in cases where there is no such operator movement, BA is obligatory. We have already seen in (49) that if the VP of the verb is not a QP, both BA-NP1-V-NP2 and V-NP1-NP2 are acceptable, because NP1

is not an operator and remains in the VP. Thus, we predict that BA in (49) is obligatory. Compare (49) with (55) below:

- (55)a. \*Wo Lisi da-le yidun.  
      NP1 V NP2
- b. \*Ta Zhangsan xia-le yitiao.  
      NP1 V NP2

(55) shows that our prediction is correct.

To sum up, BA-insertion may apply to the external object of a verb. But the external object must move out of the VP if the VP is a GP. In such cases, the external object in a GP is in complementary distribution with that in a non-GP:

- |        |                |    |                  |
|--------|----------------|----|------------------|
| (56)a. | non-GP         | b. | GP               |
|        | [BA-NP1 V NP2] |    | (BA)-NP1-[V NP2] |
|        | [V NP1 NP2]    |    | *[V NP1 NP2]     |
|        | *[NP1 V NP2]   |    | NP1-[V NP2]      |

where NP1 is the external object, and [...V...] = non-GP/GP under the respective headings. A GP contains a quantifier, which is NP2. NP2 in a GP is related to NP1 in a whole-part entailment (see (46)).

### 3.3 BEI-insertion

In 3.1, we have seen that a BEI phrase is obligatory in some passive sentences (see (4)), but optional in others (see (1b) and (6)). Besides, BEI occurs in passives with or without an agent (see (1b) and H. Wang, 1959; W. Wang, 1964; Chao, 1968; Cheung, 1973; Zhu, 1984; etc.). I shall study these issues in this section.

Compare (57) and (58) below:

(57)a. Fan chi-wan-le.

rice eat-finish-asp

- The rice has been eaten up.

b. Jiu he-guang-le.

wine drink-finish-asp

- The wine has been drunk.

(58)a. Fan /bei/ chi-wan-le.

rice p.m eat-finish-asp

- The rice has been eaten up.

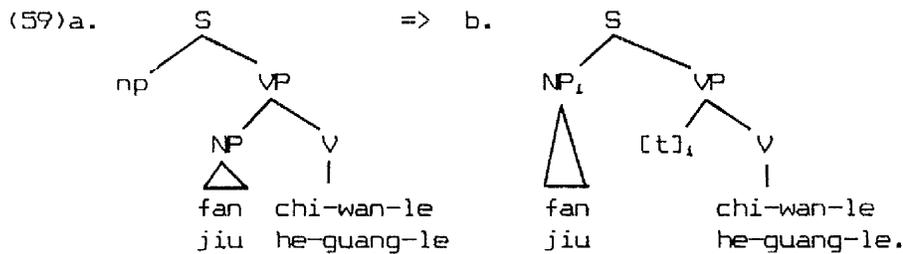
b. Jiu /bei/ he-guang-le.

wine p.m drink-finish-asp

- The wine has been drunk.

The sentences in (57) share the same readings as those in (58), suggesting that BEI is not base-generated but inserted into these sentences <2>. The question is how BEI-insertion takes place.

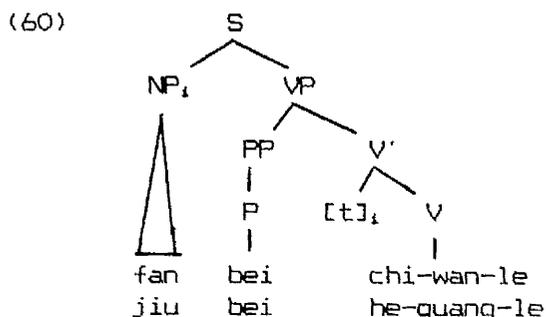
First of all, we have already argued in 2.3.2.1 and 2.3.2.2 that passivisation in Chinese is by NP-movement from [NP, VP] position into [np, S] position. Thus, for (57) without the presence of BEI, we may have:



in which [NP, VP] is forced to move, as it cannot get Case from the verb. The [np, S] position is available as a result of the Extended Projection Principle (EPP). One reason we take it to be empty at D-structure is based on the fact that the sentences in (57) do not

contain any extra lexical NPs, except [NP, VP] (see 3.5 for further discussion). Besides, I have argued in (58) of 2.3.2.2 that movement of [NP, VP] will cause suspension of  $\theta$ -marking to [np/NP, S] position. So, the  $\theta$ -Criterion is satisfied.

Now, consider BEI in (58). Assuming that it is inserted into (59b), we may then have:



Unlike BA-insertion which is realised as a P' (see 3.2.1), BEI-insertion in (60) is a PP. This is because BEI-insertion in (60) does not need to assign Case. Cases where BEI-insertion assigns Case are discussed shortly. There are reasons for believing that the structure in (60) is adequate, as the investigation of its constituency shows in 3.1.

Although BEI-insertion appears to be optional in (57-58) (also see (6)), there are cases where BEI is obligatory. E.g.

(61)a. Ta bei qiang-le.

3sg p.m rob asp

- S/He was robbed.

b. \*Ta qiang-le.

3sg rob asp

It seems therefore that, for (61a), when the object of the verb moves into subject position to form a passive, BEI-insertion must follow as part of passivisation, otherwise ungrammaticality results.

So, the point at issue is whether BEI-insertion should be

obligatory in passivisation in Chinese. The answer is yes, because it is obvious that obligatory insertion will cover passives both obligatorily and optionally taking BEI, but optional insertion will result in ill-formed strings such as in (61b). Having said this, we do have to account for cases like (57-58) where BEI-insertion is optional. For these cases, I assume that the relevant verbs are marked in the lexicon to the effect that movement of their objects into subject position is sufficient for passivisation (see 3.5 for further discussion). This assumption may be supported by the fact that while the language learner (a child or a second-language learner) can apply BEI, as a rule, to any passive sentence in his speech, he has to learn individually about which passive sentences may have an optional BEI.

Now we come to passives with an agent. Consider:

(62)a. Xin bei wo shao-le. ' .

letter p.m me burn-asp

- The letter has been burned by me.

b. Fangzi bei wo mai-le.

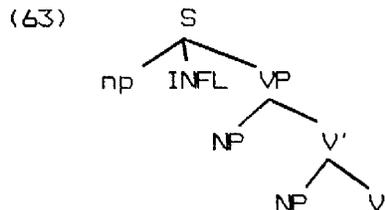
house p.m me sell-asp

- The house has been sold by me.

(62) shows that BEI has a complement - the agent of the action identified by the verb(s).

In Chomsky (1965), the agent-NP was base-generated at [NP, S] position and subsequently moved into an [NP, PP] position. In GB, this analysis is inadequate for at least one reason. If the agent-NP is base-generated as [NP, S], it should also be Case-marked and should not move, and the resultant sentence will be active. Therefore, the agent-NP in a passive sentence should not be generated in [NP, S] position at all (see further discussions in 3.5). An alternative is to treat the agent-NP as

an external complement to the verb. As far as Chinese is concerned, we may then have the following:

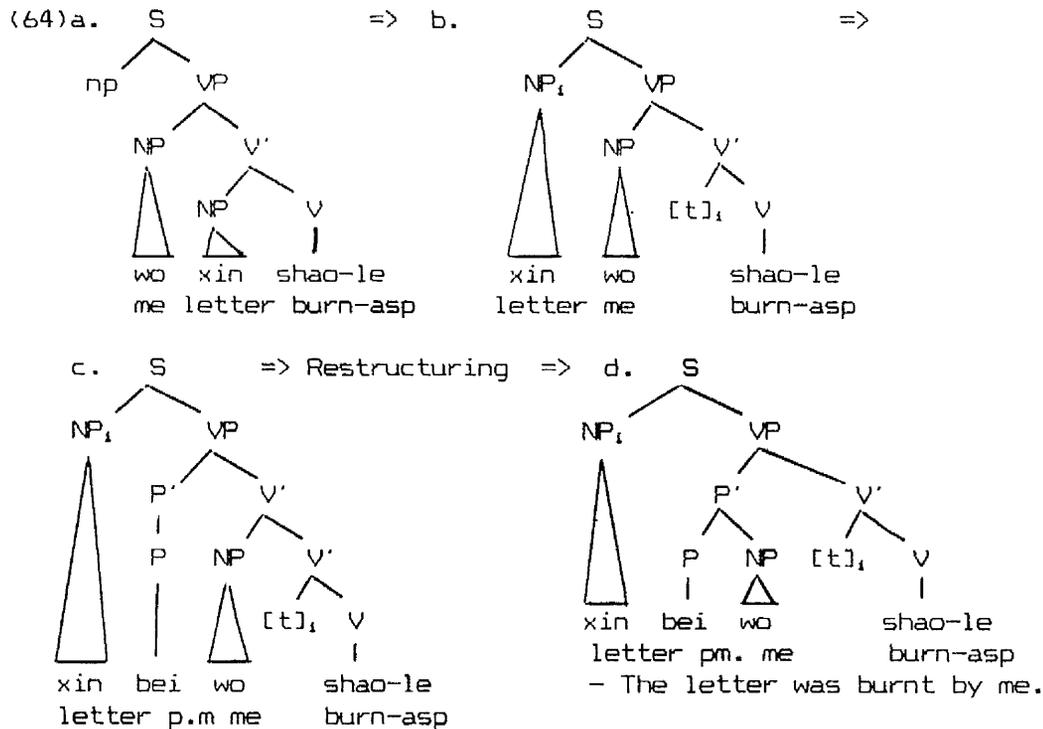


As stated in 1.1, a verb assigns a  $\theta$ -role to its subject, and this  $\theta$ -role is assigned to subject position only. Suppose that this is the case in (63), and that the verb also assigns a  $\theta$ -role to its object (= the internal complement, which we may write as [NP(in.), VP]). Then the external complement, written as [NP(ex.), VP], is not  $\theta$ -marked. In fact, Emonds (1985) argues that within a VP, the verb  $\theta$ -marks [NP(in.), VP] only, and the other complement(s) are  $\theta$ -marked by preposition(s). Adopting this approach, it means that [NP(ex.), VP] in (63) may receive a  $\theta$ -role from a preposition.

Consider Case-assignment in (63). Neither NP in the VP has Case, and either of them can move into [np, S] position for Case. But if [NP(ex.), VP] does so, the resultant sentence will be active (NB: such a movement is possible also because this NP carries no  $\theta$ -role) <3>. Instead, [NP(in.), VP] moves to yield a passive sentence. Given that movement of [NP(in.), VP] causes suspension of  $\theta$ -marking to [np/NP, S] position (see (58) of 2.3.2.2), as a result, the  $\theta$ -Criterion is not violated (NB: although I did not specify [NP, VP] = [NP(in.), VP] in (58) of 2.3.2.2, it should be clear by now that this is the case). [NP(in.), VP] movement is illustrated in (64a-b).

Furthermore, I have just argued in the above that BEI-insertion should apply following movement of [NP(in.), VP] into [np, S] position and is part of passivisation. Thus, BEI is inserted and assigns Case as

well as a  $\theta$ -role to [NP(ex.), VP], as illustrated in (64c-d):



There are two further points about BEI-insertion in (64c-d). Firstly, it is realized as a P', rather than as a PP such as in (60). This is because BEI needs to assign Case to the following NP, and a process of PP-transparency has presumably applied (cf. 3.2). The empirical basis for PP-transparency in this case is that the P' (= BEI-NP) functions as an agent/instrumental adverbial to the verb (cf. 3.2). (62) shows the agent use of a BEI phrase, and the instrumental use is shown in:

- (65)a. Fangzi bei feng gua-dao-le.  
 house p.m. wind blow-down-asp  
 - The house was blown down by the wind.
- b. Ta bei qiche zhong-dao-le.  
 3sg p.m. car knock-down-asp  
 - S/He was knocked down by the car.

Secondly, the basis for assuming that BEI also assigns a  $\theta$ -role (= agent or instrumental) to its complement, is that BEI is traditionally

considered an agent/instrumental marker (cf. Y. Li, 1971; Tang, 1972; Teng, 1975; Chang, 1977).

There is reason to believe that the final structure in (64d) is sound, as we have demonstrated in 3.1. Further empirical facts that show that BEI-NP should be treated as one single constituent are:

(66)a. Xin bei ta tou-le, bei ta shao-le

letter p.m 3sg steal asp p.m 3sg burn asp

- The letter has been stolen and burned by him.

b. \*Xin bei ta tou-le, \_\_ ta shao-le

letter p.m 3sg steal asp 3sg burn asp

c. Xin bei ta tou-le, \_\_ \_\_ shao-le

letter p.m 3sg steal asp burn asp

- The letter has been stolen and burned by him.

(67)a. Fangzi bei ta mai-le, bei ta zu-le.

house p.m me sell asp p.m. 3sg rent asp

- The houses have been sold and rented out by him.

b. \*Fangzi bei ta mai-le, \_\_ ta zu-le.

house p.m me sell asp 3sg rent asp

c. Fangzi bei ta mai-le, \_\_ \_\_ zu-le.

house p.m me sell asp rent asp

- The houses have been sold and rented out by him.

Thus, summarising, BEI-insertion is part of passivisation in Chinese. Agentless passives differ at D-structure from those with an agent, and an NP-agent is treated as an external complement to the verb. BEI-insertion to a passive with an agent  $\theta$ - and Case-marks this external NP.

### 3.4 BA- and BEI-insertions

Having examined BA and BEI insertions separately in 3.2 and 3.3, let us study the following constructions containing both BA and BEI:

(68)a. Nage ren bei wo ba ta gan-zou-le.

that person p.m. me ob.m res.p drive-leave-asp

- That man was sent packing by me.

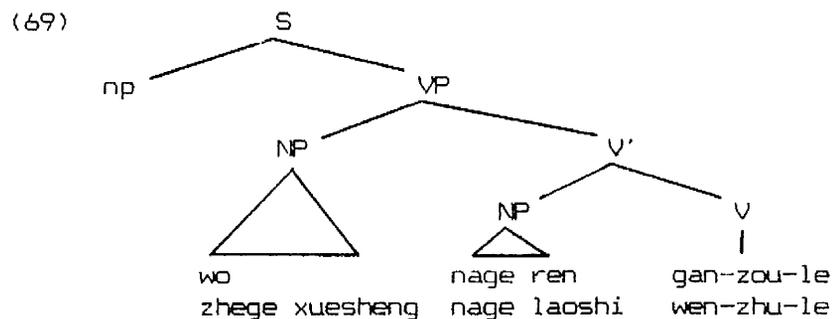
b. Nage laoshi bei zhege xuesheng ba ta wen-zhu-le.

that teacher p.m this student ob.m res.p ask-stop-asp

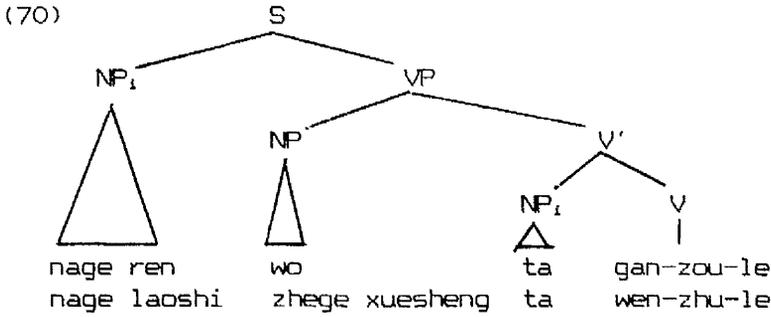
- That teacher was stumped by the student ('s question).

In (68), the [NP, S] and the [NP, BA] have to be coreferential, and the [NP, BA] has to be in pronominal form. These suggest that the latter is a resumptive pronoun of the former.

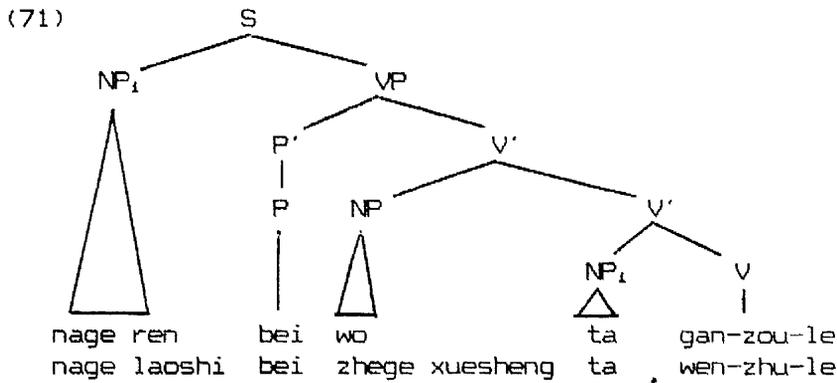
Based on the structure in (63) for passives with an agent, we may first have a D-structure for (68) in:



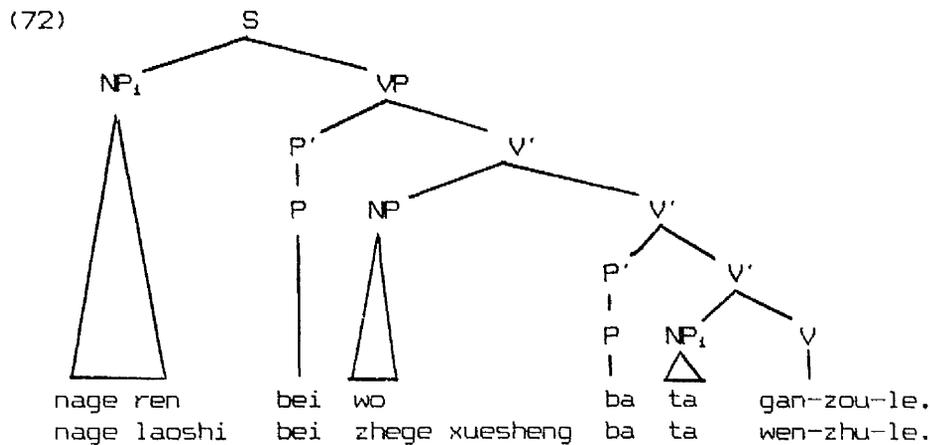
Assuming that NP-movement leaves either a trace or a resumptive pronoun behind (cf. van Haaften and Vat, 1983; Cinque, 1983; van Riemsdijk and Williams, 1985) <4>, the [NP(in.), VP] in (69), when moving into [np, S] position, leaves a resumptive pronoun, as in:



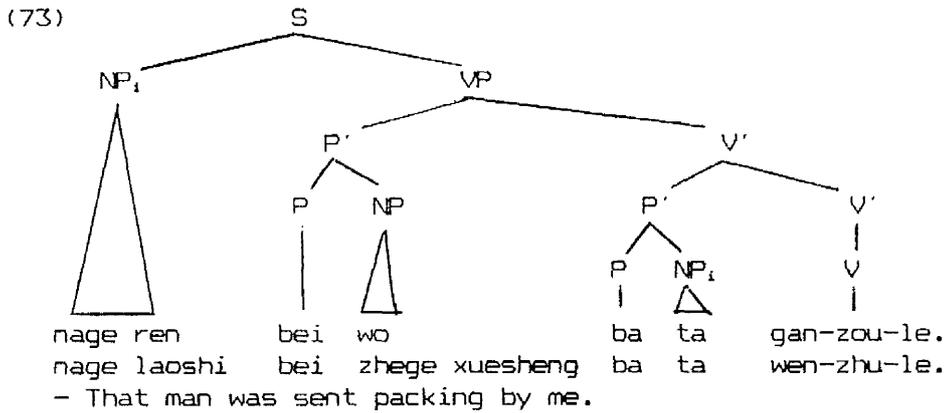
As a result of the [NP(in.), VP] movement in (68), BEI-insertion should also apply as part of passivisation to assign Case and a  $\theta$ -role to the external NP (= agent). Thus, we have:



Then BA-insertion applies to assign Case to the resumptive pronoun at the [NP(in.), VP], as in:



After restructuring, we finally reach the following structure:



The structure in (73) proves to be sound as to its constituency. Under CD, (73) predicts that the P' (= BEI-NP) and the V' (BA-NP-V) will delete, but not the V. Consider:

(74)a. Zhangsan bei Lisi ba ta pian-le, bei Wangwu ba ta pian-le.  
 ... p.m ... ob.m res.p cheat-asp p.m ... ob.m res.p cheat-asp  
 - Zhangsan was cheated, by Lisi and Wangwu.

b. \*Zhangsan bei Lisi ba ta \_\_, bei Wangwu ba ta pian-le.  
 ... p.m ... ob.m res.p p.m ... ob.m res.p cheat-asp

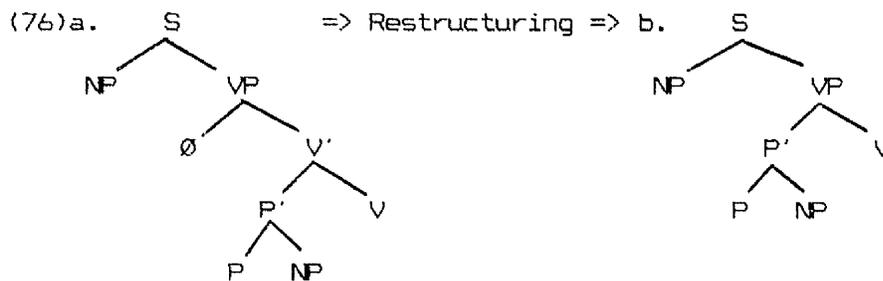
c. Zhangsan bei Lisi \_\_ \_\_, bei Wangwu ba ta pian-le.  
 ... p.m ... p.m ... ob.m res.p cheat-asp  
 - Zhangsan was cheated by Lisi and Wangwu.

(75)a. Zhangsan bei Lisi ba ta pian-le, bei Lisi ba ta qiang-le.  
 ... p.m ... ob.m res.p cheat-asp p.m ... ob.m res.p rob-asp  
 - Zhangsan was cheated and robbed by Lisi.

b. Zhangsan bei Lisi ba ta pian-le, \_\_ ba ta qiang-le.  
 ... p.m ... ob.m res.p cheat-asp ob.m res.p rob-asp  
 - Zhangsan was cheated and robbed by Lisi.

c. Zhangsan bei Lisi ba ta pian-le, \_\_ \_\_ qiang-le.  
 ... p.m ... ob.m res.p cheat-asp rob-asp  
 - Zhangsan was cheated and robbed by Lisi.

As we see, the peripheral, identical verb does not delete in (74b), unless it is deleted together with the preceding BA-NP in (74c). This is exactly what the structure in (73) predicts. In (75b), the leftmost BEI-NP deletes, suggesting that it is immediately dominated by the conjunct, also predicted in (73). Furthermore, after the BEI-NP deletion in (75b), the following BA-NP also deletes, as shown in (75c). This is because, under (73), after the P' (= BEI-NP) is deleted, the following P' (= BA-NP) becomes peripheral and immediately dominated by the conjunct as well, as shown in:



Thus all the CD facts in (74-75) seem to support the structure in (73).

To sum up, the data in (68) containing both BEI and BA provides independent evidence supporting the analyses of BEI- and BA-insertions in 3.2 and 3.4. We may therefore conclude further that these analyses are adequate.

### 3.5 Discussion

Recall V-movement as an alternative to BA-insertion in Case-marking [NP, VP] (cf. 2.3.2.1 and 2.3.2.2). Apparently, these two operations are mutually exclusive, as [NP, VP] need not be Case-marked twice:

- (77)a. \*ta [xin shao-le]  
           NP   V  
           3sg letter burn-asp

- b. ta [shao-le xin]  
       V      NP  
 3sg burn-asp letter  
 - s/he burnt the letter
- c. ta [ba xin shao-le]  
       BA NP   V  
 3sg ob.m letter burn-asp  
 - s/he burnt the letter
- d. \*ta [shao-le ba xin]  
       V      BA NP  
 3sg burn-asp ob.m letter
- e. \*ta [ba shao-le xin]  
       BA   V      NP  
 3sg burn-asp ob.m letter

Given (77), we may ask what in the grammar of Chinese determines the way in which V-movement/BA-insertion operates.

In fact, there are cases where only BA-insertion seems permitted.

For example, cases where there is a postverbal PP:

- (78)a. ni [ba che ting [zai nar le]]  
       BA NP   V      PP  
 you ob.m car park at where cl.p  
 - Where did you park the car?
- b. \*ni [ting che [zai nar le]]  
       V      NP      PP  
 you park car at where cl.p
- (79)a. ta [ba zheben xiaoshuo fanyi [cheng Yingwen] le]  
       BA   NP                  V      PP  
 3sg ob.m this novel translate into English cl.p  
 - s/he translated this novel into English.
- b. \*ta [fanyi zheben xiaoshuo [cheng Yingwen] le]  
       V      NP                  PP  
 3sg translate this novel into English cl.p
- (80)a. wo [ba ta jieshao [gei ni]]  
       BA NP   V      PP  
 I ob.m 3sg introduce to you  
 - I introduce him to you.

b. ?wo [jieshao ta [gei ni]]  
       V      NP      PP  
 I introduce 3sg to you

(78-80) do not exhaust the type of data they represent, but suffice to show the point at issue.

It therefore seems that there are at least two categories of (transitive) verb involving BA-insertion: one category for which BA-insertion is optional, and the other for which BA-insertion is obligatory. Given the fact that this optionality or obligatoriness is related to syntactic contexts, as exemplified in (77-80), two possibilities arise as to how BA-insertion might operate. One, an interface linking the lexicon and D-structure will pre-process the latter. The pre-processing identifies which structure will undergo optional BA-insertion, which obligatory BA-insertion. For those which may undergo optional BA-insertion, the interface also decides whether they undergo V-movement, so that only one operation applies. Apparently, GB does not make provision for such an interface. The second possibility is that the lexicon output is coded for further syntactic processing, i.e. lexical entries are specified not only for subcategorisations, word-formation, etc., but also for syntactic processing, such as in the present case whether a verb undergoes optional/obligatory BA-insertion for its object. Again, this is not in GB, partly because GB advocates context-free syntax (cf. Chomsky, 1986a-b) <5>.

An independent issue is which of the two above-mentioned possibilities, if either, has psychological validity to a native speaker of Chinese. A third possibility (or more) may also exist. But I leave the questions raised here for future studies.

Finally, let us briefly consider the empty subject position at D-structure for a passive sentence. Although the Extended Projection

Principle (EPP) guarantees every clause a subject, it has little to do with whether this subject is empty or not. As we see in 3.3, [np, S] is essential for a passive clause at D-structure, otherwise [NP, VP] cannot move into subject position. This may be achieved in two ways. One, a verb does not select a subject from the lexicon; secondly, it does, but the insertion of the subject into D-structure is blocked by some rule. The first possibility implies that lexical selections may be coded for passive clauses (if so, for other types of clause too), and it suggests context-sensitive subcategorisation. The second possibility indirectly proposes an interface between the lexicon and D-structure. Again, these issues are independent of a grammar theory such as GB in terms of psychological reality, and their proof lies beyond the scope of the present study.

Note:

<1> It is a well-observed fact in modern Chinese that BA is more often used when a verb takes an additional complement (e.g. PP) to its object than when a verb takes an object only. No matter what the historical reasons for this may be (see amongst others Tai (1973), C. Li (1975), H-f Huang (1978) and Bennett (1978, chap. 3) for discussion), the use of BA in these cases (e.g. (20)) has in effect resulted in the preferable word order BA-NP-V-PP/S' in cases like (20a-b). The proposed view of a balance between Case-marked and non-Case-marked constituents is one way of looking at this phenomenon. We observe the following difference in grammaticality

among verbs which take an additional complement (e.g. PP) to their objects:

- |       |            |    |            |
|-------|------------|----|------------|
| (i)a. | Some       | b. | Others     |
|       | BA-NP-V-PP |    | BA-NP-V-PP |
|       | ?V-NP-PP   |    | ?V-NP-PP   |
|       | ?PP-V-NP   |    | PP-V-NP    |

Examples of both groups of verbs are in (ii)-(iv) and (v)-(vii) respectively:

- (ii)a. wo ba shu fang [zai zhuozi-shang]  
BA NP PP  
I ob.m book at table-on put

- I put the book on the table.

- b. ?wo fang shu [zai zhuozi-shang]  
V NP PP  
I put book at table-on put

- c. ?wo [zai zhuozi-shang] fang shu  
PP V NP  
I at table-on put put book

- (iii)a. wo ba ditu gua [zai qiang-shang]  
BA NP V PP  
I ob.m map hang at wall-on

- I hang the map on the wall.

- b. ?wo gua ditu [zai qiang-shang]  
V NP PP  
I hang map at wall-on

- c. ?wo [zai qiang-shang] gua ditu  
PP V NP  
I at wall-on hang map

- (iv)a. wo ba youpiao tie [zai xinfeng-shang]  
BA NP V PP  
I ob.m stamp stick at envelope-on

- I stick the stamp on the envelope.

- b. ?wo tie youpiao [zai xinfeng-shang]  
V NP PP  
I stick stamp at envelope-on

- c. ?wo [zai xinfeng-shang] tie youpiao  
PP V NP  
I at envelope-on stick stamp

(v)a. wo ba zi xie [zai heiban-shang]  
 BA NP V PP  
 I ob.m character write at blackboard  
 - I write the characters on the blackboard.

b. ?wo xie zi [zai heiban-shang]  
 V NP PP  
 I write character at blackboard

c. wo [zai heiban-shang] xie zi  
 PP V NP  
 I at blackboard write character  
 - I write characters on the blackboard.

(vi)a. wo ba riji ji [zai rijiben-shang]  
 BA NP V PP  
 I ob.m diary record at diary-book-on  
 - I write in a diary.

b. ?wo ji riji [zai rijiben-shang]  
 V NP PP  
 I record diary at diary-book-on

c. wo [zai rijiben-shang] ji riji  
 PP V NP  
 I at diary-book-on record diary  
 - I write in a diary.

(vii)a. wo ba huar xiu [zai zhentou-shang]  
 BA NP V PP  
 I ob.m flower embroider at pillow-on  
 - I embroider the flowers on the pillow.

b. ?wo xiu huar [zai zhentou-shang]  
 V NP PP  
 I embroider flower at pillow-on

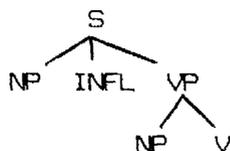
c. wo [zai zhentou-shang] xiu huar  
 PP V NP  
 I at pillow-on embroider flower  
 - I embroider flowers on the pillow.

Although the difference in grammaticality between the sentences in (ii)-(iv) and in (v)-(vii) depend on individual verbs, the fact that BA-NP-V-PP and PP-V-NP are preferred to ?V-NP-PP seems to support

the view that there may be a balance between Case-marked and non-Case-marked complements.

<2> See footnote <9> of chapter 2.

<3> One might ask, however, what prevents [NP(ex.), VP] in (63) from moving into [np, S] position in order to guarantee that (63) represents a passive clause. The answer lies in the fact that an active clause simply has a different D-structure from (63), e.g.



in which [NP, S] would be equal to [NP(ex.), VP] in (63). In other words, (63) represents the D-structure of a passive clause only. The implication arises that we treat active and passive clauses as having different lexicon output, rather than as in the early TG literature (e.g. Chomsky, 1965), which suggests that these two types of clause retain the same D-structure and differ at S-structure by means of transformation(s).

<4> As for the issue of under what conditions a moved NP would leave a resumptive pronoun instead of a trace, this needs to be better understood and its discussion does not concern me here. But it seems quite certain that resumptive pronouns are an outcome of syntactic operation(s), rather than coming from lexicon selections. E.g. relativisation of [NP, PP] in Chinese always requires a resumptive pronoun (cf. Li and Thompson, 1974a; He, 1987):

(i)a. ta ba na-ben shu shao-le

3sg ob.m that-m.p book burn-asp

- S/He burnt the book.

b. [ta ba ta shao-le de] na-ben shu ...

3sg ob.m res.p burn-asp Comp that-m.p book

- the book which s/he burnt ...

c. \*[ta ba \_\_ shao-le de] na-ben shu ...

3sg ob.m burn-asp Comp that-m.p book

In contrast, relativisation of [NP, VP] in Chinese requires an empty category:

(ii)a. ta shao-le na-ben shu

3sg burn-asp that-m.p book

- S/He burnt the book.

b. [ta shao-le \_\_ de] na-ben shu ...

3sg burn-asp Comp that-m.p book

- the book which s/he burnt ...

c. \*[ta shao-le ta de] na-ben shu ...

3sg burn-asp res.p Comp that-m.p book

As in the case we discussed in (70), we do not yet know what the exact conditions are for the occurrence of a resumptive pronoun in (i)b.

<5> The issue of whether a grammar should restrict itself to context-sensitive or to context-free subcategorisation is a major area of study. There has been some criticism of the GB school for trying in vain to get away from context-sensitive subcategorisation (see, amongst others, Gazdar (1982) and Sag and Pollard (1987) for discussion).

## Chapter 4 Wh-quantifier Constructions

In this chapter, I investigate wh-quantifier constructions in Chinese.

### 4.1 Introduction

Wh-items such as 'shei' (who), 'shenme' (what), 'na' (which) and 'nar' (where) in Chinese are also used as indefinite pronouns (cf. L. Wang, 1943:230-233, 1944:307-308; Lu, 1944:124-126; Chao, 1968:651-657; Lu et al, 1979:9; Hu et al, 1981:324; Li and Thompson, 1981:527-531; Chu, 1983:177-179; D. Zhu, 1984:93-94; etc.). For example:

(1)a. A: Shei lai-le?

who come-asp

- Who came?

B: Mei-you shei lai. <1>

not-asp who come

- No one came.

b. A: Ni xihuan shenme?

you like what

- What do you like?

B: Wo bu xihuan shenme.

I not like what

- I do not like anything.

c. A: Ni qu nar?

you go where

- Where are you going?

B: Wo bu qu nar.

I not go where

- I am not going anywhere.

In contrast to the wh-item in Part A of (1a-c), the wh-item in Part B of (1a-c) no longer has an interrogative meaning, but functions as an indefinite pronoun. Noticeably, when a wh-item is used as an indefinite pronoun, it is in a negative sentence, and the negative item should precede a wh-item used as the subject of the sentence (cf. Part B of (1a) vs. Part B of (1b-c)).

The issue arises as to how negative wh-interrogatives contrast with those sentences that contain wh-items used as indefinite pronouns.

Consider:

(2)a. Shei mei-you lai? (cf. B of (1a))

who not-asp come

- Who did not come?

b. Ni bu xihuan shenme? (cf. B of (1b))

you not like what

- What do you not like?

c. Ni bu qu nar? (cf. B of (1c))

you not go where

- Where are you not going?

As we see, in cases where a wh-item is used as the subject, a negative wh-interrogative differs in surface form from a sentence containing a wh-item functioning as an indefinite pronoun (cf. (2a) vs. Part B of (1a)); but where a wh-item is used as the object of a verb, a negative wh-interrogative in fact shares the same surface form as a sentence containing a wh-item functioning as an indefinite pronoun (cf. (2b-c) vs. Part B of (1b-c)).

Thus there should be a principled account, firstly, for the data showing wh-items used as indefinite pronouns such as in Part B of (1a-c), and secondly for the contrast displayed between such data and wh-interrogatives as in (2a-c), i.e. the contrast in which wh-interrogatives and sentences that contain wh-items used as indefinite pronouns share the same surface form but have different interpretations.

Yet our observation of the behaviour of wh-items used as indefinite pronouns is not complete. We have noticed in (1) that when used as an indefinite pronoun, a wh-item is in a negative sentence. The issue arises as to whether wh-items can be used as indefinite pronouns in affirmative sentences. The answer is yes, but the affirmative sentences in question must contain the quantifying adverb 'dou'(all). For example:

(3)a. Shei dou lai-guo./\*Shei lai-guo. <2>

who all come asp

- Everyone came.

b. Wo shei dou kanjian-guo./\*Wo shei kanjian-guo.

I who all see asp

- I saw everyone.

c. Shei wo dou kanjian-guo./\*Shei wo kanjian-guo.

who I all see asp

- I saw everyone.

d. Wo gen shei dou lai-guo./\*Wo gen shei lai-guo. <3>

I with who all come asp

- I came with everyone.

e. Gen shei wo dou lai-guo./\*Gen shei wo lai-guo. <4>

with who I all come asp

- I came with everyone.

- (4)a. Shenme dou hao chi./\*Shenme hao chi. <5>  
 what all good eat  
 - Everything is good to eat.
- b. Wo shenme dou xihuan./\*Wo shenme xihuan.  
 I what all like  
 - I like everything.
- c. Shenme wo dou xihuan./\*Shenme wo xihuan.  
 what I all like  
 - I like everything.
- d. Wo yong shenme dou zuo fan./\*Wo yong shenme zuo fan. <6>  
 I with what all do meal  
 - I cook with everything.
- e. Yong shenme wo dou zuo fan./\*Yong shenme wo zuo fan. <7>  
 with what I all do meal  
 - I cook with everything.
- (5)a. Na jian maoyi dou hao kan./\*Na jian maoyi hao kan. <8>  
 which m.p jumper all good look  
 - Every jumper looks good.
- b. Wo na jian maoyi dou yao./\*Wo na jian maoyi yao.  
 I which m.p jumper all want  
 - I want all the jumpers.
- c. Na jian maoyi wo dou yao./\*Na jian maoyi wo yao.  
 which m.p jumper I all want  
 - I want all the jumpers.
- d. Wo dui na jian maoyi dou manyi./\*Wo dui na jian maoyi manyi. <9>  
 I to which m.p jumper all satisfy  
 - I am satisfied with every jumper.

e. Dui na jian maoyi wo dou manyi./\*Dui na jian maoyi wo manyi. <10>

to which m.p jumper I all satisfy

- I am satisfied with every jumper.

(6)a. Nar dou you cesuo./\*Nar you cesuo. <11>

where all have toilet

- There are toilets everywhere.

b. Wo nar dou qu./\*Wo nar qu.

I where all go

- I go everywhere.

c. Nar wo dou qu./\*Nar wo qu.

where I all go

- I go everywhere.

d. Wo cong nar dou lai./\*Wo cong nar lai. <12>

I from where all come

- I come from everywhere.

e. Cong nar wo dou lai./\*Cong nar wo lai. <13>

from where I all come

- I come from everywhere.

There are two points to make about the data in (3-6). Firstly, 'dou'(all) is required for these sentences, and secondly, in cases where a wh-item is used as the object of a verb or preposition, it appears either in a preverbal position or in the clause initial position (see (3b-e), (4b-e), (5b-e) and (6b-e)).

I have demonstrated in 3.2.2 that when a [VP, S] contains the quantifying adverb 'dou'(all), it becomes a universal quantificational phrase (UQP). The principle seems to be that a UQP must follow the NP it quantifies, and holds the distributions as follows (see 3.2.2):

- (7)a. [NP, S]-[UQP] (quantifying [NP, S])  
 b. ... [NP, VP]-[UQP] (quantifying [NP, VP])  
 c. [NP, VP] ... [UQP] (quantifying [NP, VP])  
 d. ... [NP, PP]-[UQP] (quantifying [NP, PP])  
 e. [NP, PP] ... [UQP] (quantifying [NP, PP])

where [UQP] = [<sub>NP</sub> dou ...V...], and [NP, S], [NP, VP] in (7c) and [NP, PP] in (7e) are in the clause initial position. Namely, when a UQP quantifies [NP, VP/PP], the latter either immediately precedes the UQP or occurs in the clause initial position.

We have seen that the data in (3-6) containing wh-items used as indefinite pronouns conform to the distributional patterns in (7).

Now, let us compare wh-interrogatives with the sentences that contain wh-items used as indefinite pronouns in (3-6). First, consider the basic forms in:

(8)a. Shei lai-guo?

who come asp

- Who came?

b. Ni kanjian-guo shei?

you see asp who

- Whom did you see?

c. Ni gen shei lai-guo?

you with who come asp

- Who did you come with?

(9)a. Shenme hao chi?

what good eat

- What is good to eat?

b. Ni xihuan shenme?

you like what

- What do you like?

c. Ni yong shenme zuo fan?

you with what do meal

- What do you cook with?

(10)a. Na jian maoyi hao kan?

which m.p jumper good look

- Which jumper looks good?

b. Ni yao na jian maoyi?

you want which m.p jumper

- Which jumper do you want?

c. Ni dui na jian maoyi manyi?

you to which m.p jumper satisfy

- Which jumper are you satisfied with?

(11)a. Nar you cesuo?

where have toilet

- Where is the toilet?

b. Ni qu nar?

you go where

- Where are you going?

c. Ni cong nar lai?

you from where come

- Where do you come from?

As we see in (8-11), wh-items remain in situ in wh-interrogatives in Chinese (cf. Huang, 1982a-b; Aoun, 1984, 1986), whether they are used as the subject (e.g. (8a), (9a), (10a) and (11a)), or as the object of a verb or a preposition (e.g. (8b-c), (9b-c), (10b-c) and (11b-c)).

Then, consider the wh-interrogatives in (8-11) interacting with the quantifying adverb 'dou'(all), if the wh-items denote a plural meaning:

(12)a. Shei dou lai-guo?

who all come asp

- Who are the people who came?

b. Ni dou kanjian-guo shei?

you all see asp who

- Who are the the people you saw?

c. Ni dou gen shei lai-guo?

you all with who come asp

- Who are the people you came with?

(13)a. Shenme (dongxi) dou hao chi?

what (things) all good eat

- What are the things that are good to eat?

b. Ni dou xihuan shenme?

you all like what

- What are the things you like?

c. Ni dou yong shenme zuo fan?

you all with what do meal

- What are the things you cook with?

(14)a. Na-xie maoyi dou hao kan? (cf. 10a)

which-pl. jumper all good look

- Which jumpers look good?

b. Ni dou yao na-xie maoyi? (cf. 10b)

you all want which-pl. jumper

- Which jumpers do you want?

c. Ni dou dui na-xie maoyi manyi? (cf. 10c)

you all to which-pl. jumper satisfy

- Which jumpers are you satisfied with?

(15)a. Nar dou you cesuo?

where all have toilet

- What are the places where there is a toilet?

b. Ni dou qu nar?

you all go where

- What are the places you are going to?

c. Ni dou cong nar lai?

you all from where come

- What are the places you came from?

Owing to the presence of 'dou'(all), the wh-interrogatives in (12-15) have a quantificational interpretation, compared with those in (8-11).

However, we find that the wh-interrogatives in (12-15) do not seem to conform to the distributional patterns in (7), because those wh-items which are used as the object of a verb/preposition do not appear in a preverbal position or in the clause initial position, although these items are quantified (see (12b-c), (13b-c), (14b-c) and (15b-c)). This is to say that, irrespective of the presence of a UQP, a wh-item used as [NP, VP/PP] will remain in situ (cf. (8-11) vs. (12-15)).

Thus, the contrast between wh-items in interrogatives which remain in situ and those used as indefinite pronouns which appear in a preverbal position or in the clause initial position calls for a principled account of the relevant facts involved.

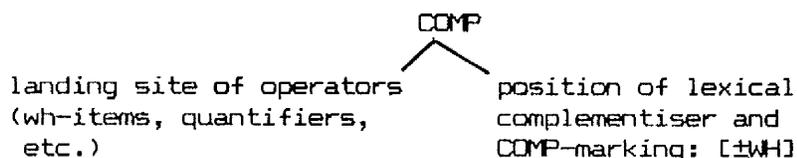
Having given the above data, I shall in the following propose an analysis for the constructions that contain wh-items used as indefinite pronouns. For this purpose, a nomenclature should be introduced.

Because indefinite pronouns are usually defined as quantifiers in grammar, when used as such, wh-items are thus referred to as wh-quantifiers (Huang, 1984:544). As we have observed in the above, wh-quantifiers are attributed to universal quantification, hence regarded as universal quantifiers (cf. Zhu, 1984:93-94).

#### 4.2 COMP-marking

In GB, COMP is generally taken to be head-like and to branch as follows (cf. Chomsky, 1986b:23; Muysken and van Riemsdijk, 1986:16):

(16)



The feature  $\pm$ WH marks the types of clause. +WH represents an interrogative clause, and once a COMP is marked +WH, it must contain a wh-item, or an interrogative complementiser (such as *whether* in English). -WH represents a non-interrogative clause; a COMP marked -WH can either contain a lexical complementiser (such as *that* in English), or be null. Lexicon selections decide how a COMP is to be marked. For example, if a verb semantically selects (s-selects) a wh-item as its subject or object, the clause in which this verb occurs will be marked +WH in COMP.

It is assumed that once a wh-item is s-selected for an interrogative clause, the COMP of that clause should be marked +WH and remains so marked at all levels of grammar (i.e. at D-structure, S-structure and LF). However, it is parametrical as to which level this COMP is first filled at. In English, for example, wh-items in interrogatives move into COMP at S-structure (Chomsky, 1986a-b). In

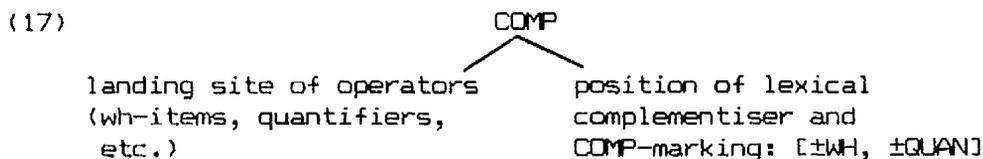
contrast, wh-items in interrogatives remain in situ in Chinese, as shown in (8-11), but are believed to move into COMP in LF (Huang, 1982a-b; Chomsky, 1986a-b). According to Aoun (1986), whether wh-movement applies at a certain level of grammar depends on whether the relevant selection restrictions are met at that level. For languages like English and French, the selection restrictions for wh-interrogatives must be met at S-structure, so that wh-movement in wh-interrogatives applies in Syntax of these languages; but in Chinese the selection restrictions for wh-interrogatives need not be met until LF, so wh-items (in interrogatives) move in LF (cf. Aoun, 1986:XV, 3, 25-29, 49).

Now, consider wh-quantifiers in Chinese. We have observed two situations in 4.1: a) they remain in situ (see (1)), and b) they appear in the clause initial position or in a preverbal position, when interacting with a UQP (see (3-6)). Under the first situation, although they remain in situ, wh-quantifiers will presumably be raised to COMP in LF, because all quantifiers are raised to COMP in LF for interpretive purposes (cf. Chomsky, 1986a-b). Extending Aoun's (1986) view on wh-interrogatives to wh-quantifiers, we may then say that because the selection restrictions for wh-quantifiers must be met in LF, they move into COMP in LF <14>.

But what is more our concern here is the second situation where syntactic movement of wh-quantifiers seems to apply. In this situation, wh-quantifiers must appear either in the clause initial position or in a preverbal position. It is therefore highly plausible to assume that they move into these positions in Syntax. Suppose that the clause initial position is in COMP, and that the preverbal position is in INFL (wh-movement into each position will be discussed later in 4.3). Presumably, those that move into COMP in Syntax will remain there in LF,

so that the LF interpretive rules can apply; but those that move into INFL in Syntax will be raised to COMP in LF to meet the interpretive rules. As for why wh-quantifiers must move in Syntax, we have already observed that it happens when wh-quantifiers interact with a UQP (see (3-6)). This indicates that in the presence of a UQP, the conditions under which the selection restrictions for wh-quantifiers are satisfied have presumably changed, and in such a way that these selection restrictions must be met at S-structure instead of LF. To sum up, in the absence of a UQP, wh-quantifiers remain in situ and move into COMP in LF; in the presence of a UQP, they move into COMP/INFL in Syntax.

If both situations discussed in the above are correct, there is a compelling issue that needs to be resolved, i.e. how to capture the movement of wh-quantifiers, in Syntax and in LF. As stated earlier, the feature +/-WH in COMP marks the distinction between interrogative and non-interrogative clauses. But, unfortunately, nothing in COMP marks the distinction between clauses that contain quantifiers and those that do not. Suppose that we call the former type of clause a quantificational clause and the latter type a non-quantificational clause. To mark these types of clause, I thus propose that COMP should contain the abstract feature  $\pm$ QUAN(tification), as illustrated in:



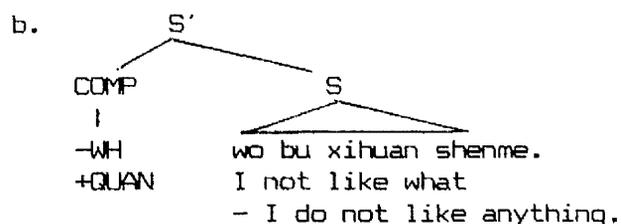
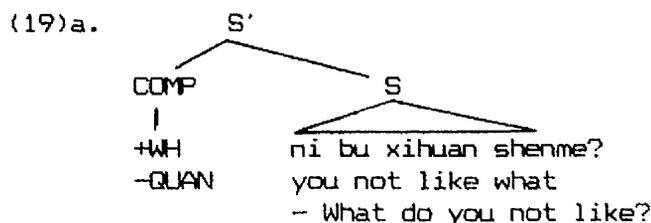
The feature  $\pm$ QUAN in (17) functions as follows: when a quantifier is s-selected by a verb, or by a lexical item which is in turn s-selected by a verb, the COMP of the clause in which the verb occurs will be marked +QUAN. At the same time, the COMP will be marked by  $\pm$ WH independently. The combinations of  $\pm$ WH and  $\pm$ QUAN are:

- (18)a. [-WH, +QUAN] = quantificational  
 b. [+WH, -QUAN] = interrogative  
 c. [+WH, +QUAN] = interrogative + quantificational  
 d. [-WH, -QUAN] = non-interrogative + non-quantificational

Once a COMP is marked +QUAN, it must contain a quantifier. But when the COMP is first filled by a quantifier depends on language-specific conditions, i.e. it is parametrical. In English, for example, universal quantifiers will not be raised into COMP until LF (Chomsky, 1986b).

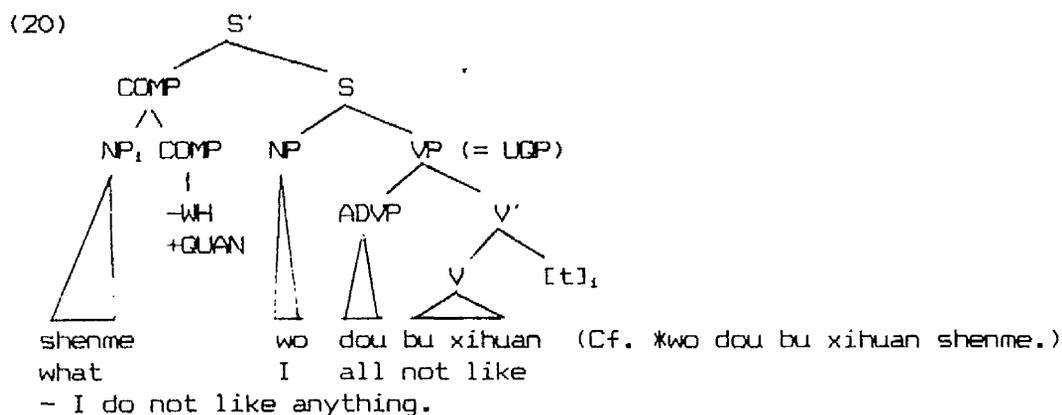
In contrast, wh-quantifiers in Chinese may move into COMP in Syntax. In such a case, the COMP-marking system in (18) immediately offers a principled account for the various contrasts displayed between wh-interrogatives and wh-quantifier expressions which we have observed in 4.1. Let us consider them one by one below.

Firstly, we see in (1-2) that negative wh-interrogatives in which wh-items are used as [NP, VP] share the same surface form with wh-quantifier expressions in which wh-quantifiers are used as [NP, VP]. Under the COMP-marking system in (18), the distinction between these two types of clause is automatically made, as illustrated in:



In both cases of (19), the wh-item in (19a) and the wh-quantifier in (19b) remain in situ. This is because, in the former case, wh-items in interrogatives in Chinese do not move in Syntax (see (8-11)); and because, in the latter case, the sentence does not contain a UQP (cf. (3-6)). But, presumably, the wh-item in (19a) will move into COMP in LF (cf. Huang, 1982a-b), for the COMP is marked +WH; so will the wh-quantifier in (19b), for the COMP is marked +QUAN.

Secondly, we see in (3-6) that wh-quantifiers which function as [NP, VP] must appear in the clause initial position or in a preverbal position, when they interact with a UQP. Let us consider the case in which a wh-quantifier appears in the clause initial position, which we take as being in COMP. Thus, compare (19b) with (20) below:

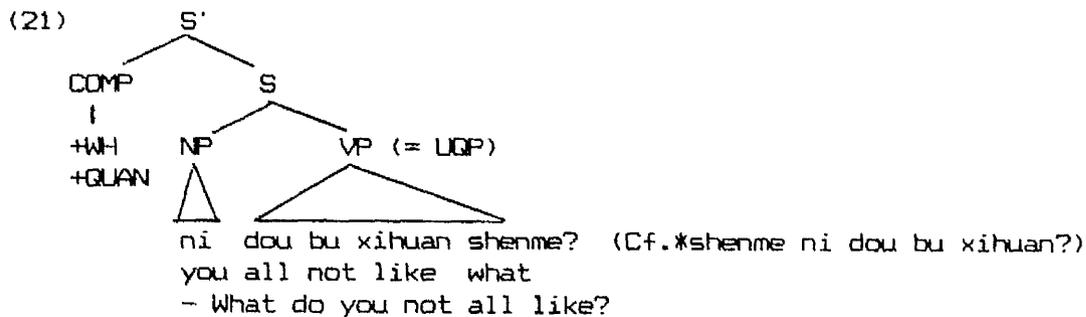


Although the presence of a UQP is the condition under which the syntactic wh-movement in (20) applies, the reason why the wh-quantifier can move into COMP at all is that the COMP is marked +QUAN.

Note that the quantifying adverb 'dou'(all) in (20) is also a quantifier, which presumably will be raised to COMP in LF under the interpretative rules. This is to say that the COMP in (20) is marked +QUAN not only because of the presence of the wh-quantifier, but also because of the presence of 'dou'(all). Consequently, +QUAN marks any

clause that contains quantifier(s).

(20) is thus contrasted with (21) below representing a wh-interrogative which contains a UQP (see data in (12-15)):



in which the wh-item remains in situ because +WH indicates that this is an interrogative clause. At the same time, +QUAN in (21) also indicates that the clause is quantificational, as it contains the quantifier 'dou' (all), which presumably will move into COMP in LF.

Thus, we have seen how the COMP-marking system in (18) accounts for facts concerning wh-quantifiers in Chinese in principle. Detailed analyses of relevant data will be given in the next two sections, followed by discussions of universal quantifiers in Chinese in general.

#### 4.3 Wh-quantifier Movement

##### 4.3.1 Moving into COMP

As we see in (3-6), wh-quantifiers that appear in the clause initial position can be [NP, S], [NP, VP] or [NP, PP]. In (20) of 4.2, I briefly analysed the case of [NP, VP], which constitutes the core case of wh-quantifier movement. The validity of the analysis in (20) is based on the contrast between wh-quantifiers, which this analysis accounts for, and wh-interrogatives which the analysis in (21) accounts for.

Reproducing the contrast between the relevant data, we have:

(22)a. Shenme wo dou xihuan. (wh-quantifier; cf. (20))

what I all like

- I like everything.

b. Wo dou xihuan shenme? (wh-interrogative; cf. (21))

I all like what

- What do I all like?

The differences in meaning as well as in position of the wh-item between (22a) and (22b) evidently support the analysis in (20) for wh-quantifier expressions, as well as the analysis in (21) for wh-interrogatives. The distinction between these two types of construction is, to repeat, that there is wh-movement in the former, but wh-in-situ in the latter.

Now, let us consider the case where a wh-quantifier is used as [NP, S]. In this case, the difference between a wh-quantifier expression and a wh-interrogative lies solely in meaning, but not in the positions of the wh-item in surface form, as in:

(23)a. Shei dou xihuan ta. (wh-quantifier)

who all like 3sg

- Everyone likes her/him.

b. Shei dou xihuan ta? (wh-interrogative)

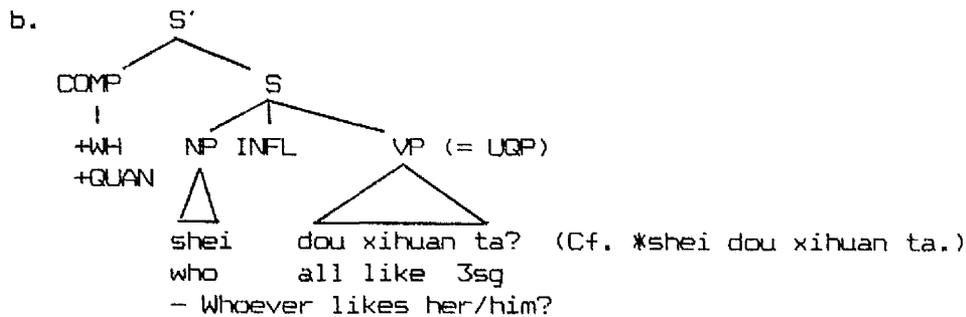
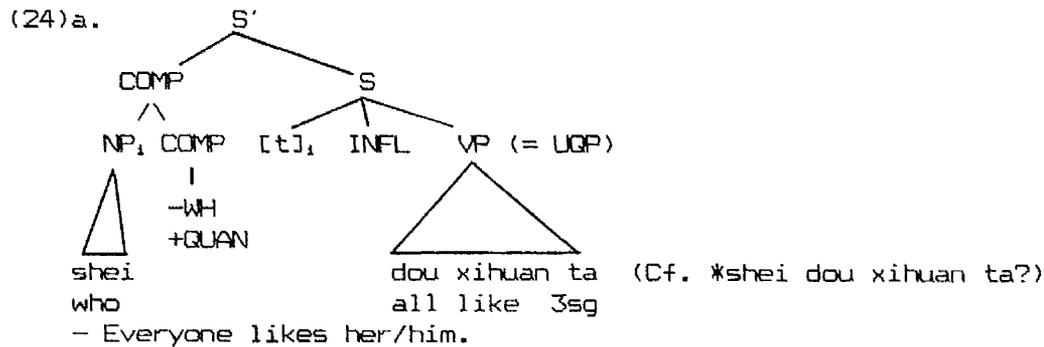
who all like 3sg

- Whoever likes her/him?

The fact that there is a difference in meaning between (23a) and (23b) indicates that there must be a difference in structure between the two, although they share the same surface form. In order to account for this structural difference, let us return to (22).

(22) represents the core case demonstrating the difference between wh-quantifier expressions and wh-interrogatives. If the respective

analyses in (20-21) for these two types of construction are valid, i.e. there is wh-movement in the former, but wh-in-situ in the latter, the same applies to the contrast in (23), i.e.



Although the wh-quantifier movement into COMP from [NP, S] position in (24a) is opaque and cannot be read off surface structures, the fact that a wh-quantifier in [NP, VP] position must move into COMP, as analysed in (20), justifies indirectly the analysis that wh-quantifiers in [NP, S] position should also move into COMP. Besides, the contrast in analysis between (24a) and (24b) captures the contrast in data between (23a) and (23b).

We now move on to the case where wh-quantifiers are used as [NP, PP]. I shall focus below on cases where wh-quantifiers appear in a PP in the clause initial position, and discuss those in a preverbal position in the next section.

Again, it is useful to view the relevant data in comparison with wh-interrogatives. E.g.

(25)a. Gen shei ta dou hao. (wh-quantifier)

with who 3sg all good

- S/He is friendly with everyone.

b. Gen shei, ta dou hao? (wh-interrogative)

with who 3sg all good

- Who is s/he friendly with?

c. Ta dou gen shei hao? (wh-interrogative)

3sg all with who good

- Who is s/he friendly with?

It is worth noting first that the wh-interrogative in (25) has two surface forms (25b-c). The fact that both forms are acceptable, and that they share the same interpretation indicates that one is derived from the other and the derivation is not obligatory. I consider that the PP 'gen shei' (with who) in (25b) is topicalised from (25c). Similar examples are:

(26)a. Shei ni dou renshi?

who you all know

- Whoever do you know?

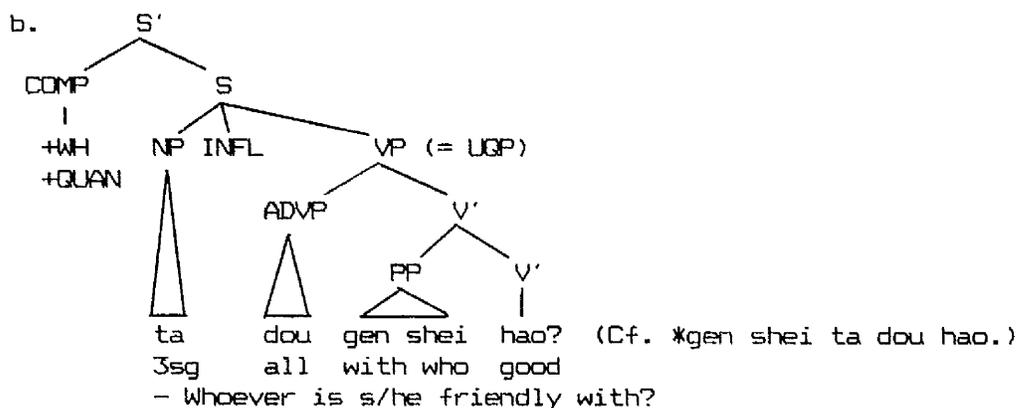
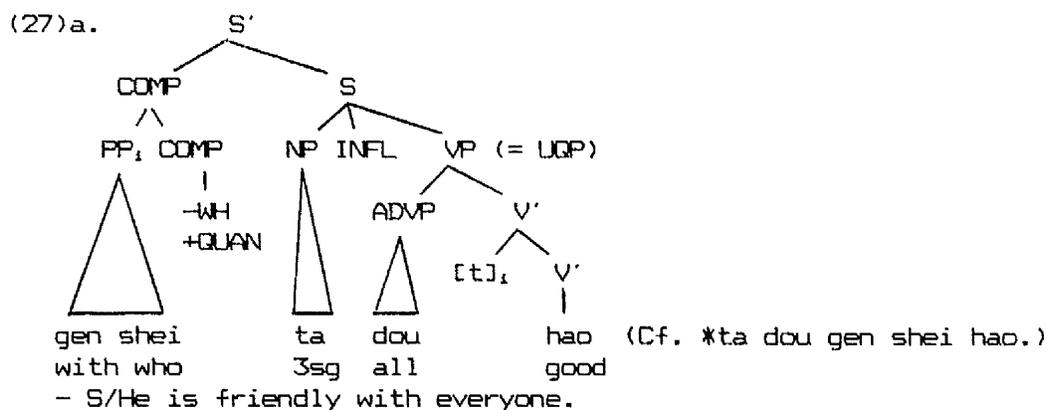
b. Ni dou renshi shei?

you all know who

- Whoever do you know?

Thus, our task is to account for the contrast displayed between (25a) and (25c). I shall return to cases of topicalisation such as (25b) and (26a) later.

Adopting the principled analysis that the distinction between wh-quantifier expressions and wh-interrogatives is that there is wh-movement in the former but wh-in-situ in the latter, we have the following analyses for the data in (25) (except (25b)):



Note that because wh-in-situ must apply in wh-interrogatives, the well-formedness of the wh-interrogative in (27b) serves itself as evidence for the word order ADVP-PP-V being base-generated. This implies that the contrast in analysis between (27b) in which the PP containing a wh-item as an interrogative word must stay in ADVP-PP-V, and (27a) in which the PP containing a wh-quantifier must move out of ADVP-PP-V, is justified.

It is impossible for the wh-quantifier in (27a) to be raised to COMP alone and to leave a "stranded" P behind. This is because [NP, PP] in Chinese cannot be extracted (as is well-observed in the literature; see, e.g. Chao, 1968; Tang, 1972). In other words, preposition stranding does not apply in Chinese <15>.

The only way of extracting [NP, PP] in Chinese is by left dislocation, which leaves a resumptive pronoun behind. For instance, we may

have the following:

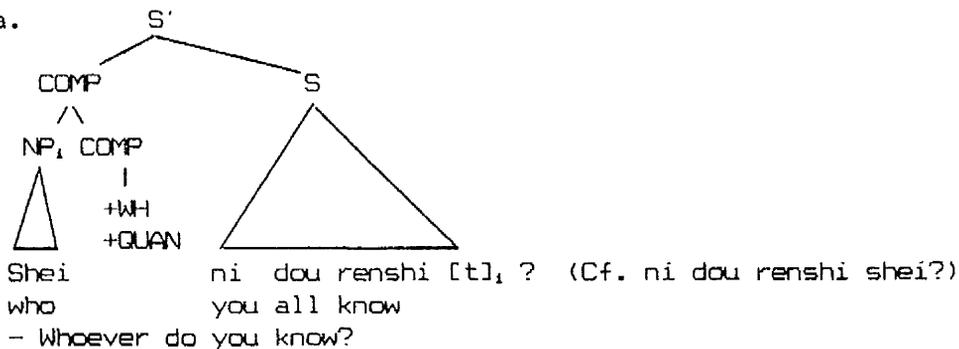
(28) Shei ta gen ta dou hao. (cf. 27a)

who 3sg with res.p all good

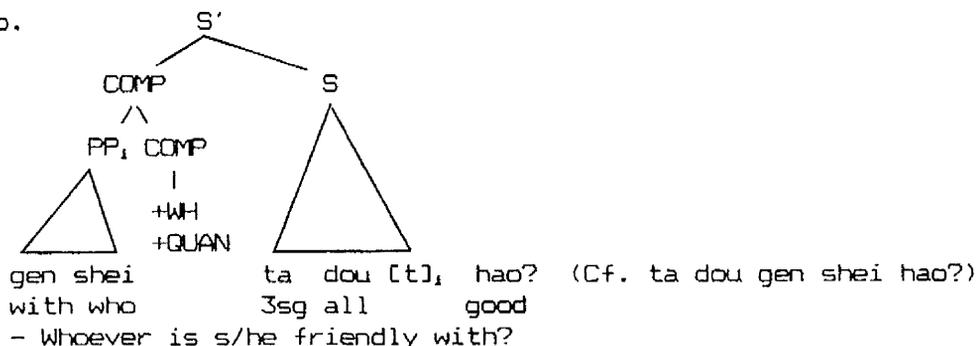
- S/He is friendly with everyone.

But we will not be able to see the structure of (28) clearly until the next section, in which wh-quantifier movement into INFL is examined. One readily observable fact about (28) is that the PP (= GEN-NP) in (28) precedes the quantifying adverb 'dou'(all), but follows it in (27a) before wh-movement. This suggests that left dislocation in (28) applied after the PP had moved out of the UQP. This is hardly surprising, because wh-movement applies between D- and S-structures, whereas movements like left dislocation or topicalisation apply only after S-structure is formed. Recall the sentences of topicalisation in (26a) and (25b), which may represent (29a) and (29b) respectively below:

(29)a.



b.



Again, as we see in (29), the COMP-marking system in (18) provides a principled account for topicalisation in wh-interrogatives. That is,

when wh-items in interrogatives which contain the quantifying adverb 'dou(all) are topicalised, the surface form of such wh-interrogatives will be the same as that of wh-quantifier expressions - compare (29a-b) with (27a) and (20). But the difference in meaning between these two types of construction remains, indicating a difference in structure between the two. This very difference in structure is captured by the COMP-marking system. For wh-interrogatives whose COMP is marked [+WH, +QUAN], wh-items appearing in COMP in Syntax indicate topicalisation, because +WH means wh-in-situ; for wh-quantifier expressions whose COMP is marked [-WH, +QUAN], wh-items may move into COMP in Syntax just because they are quantifiers.

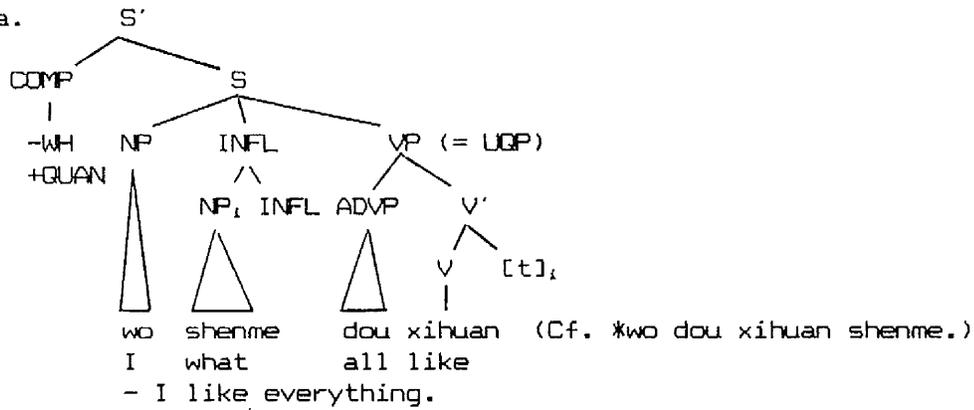
I shall return to the case of left dislocation in (28) in the next section.

#### 4.3.2 Moving into INFL

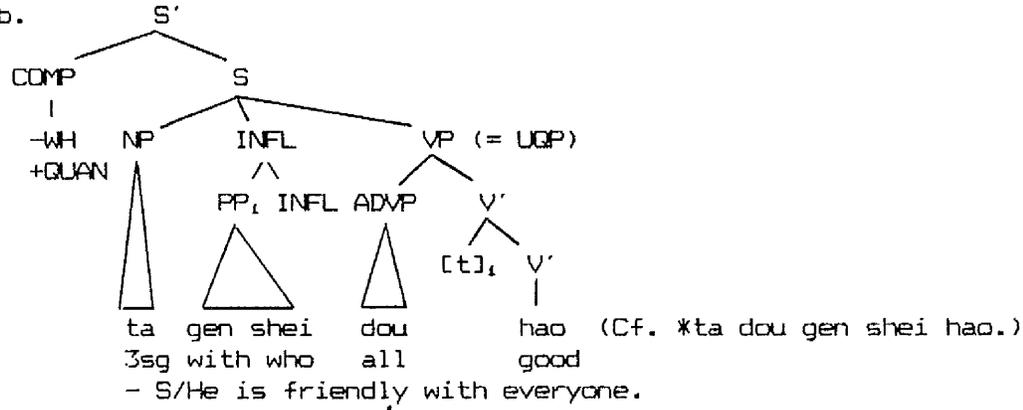
We have observed in (3-6) that when interacting with a UQP, wh-quantifiers functioning as [NP, VP/PP] may appear in a preverbal position, if they do not occur in the clause initial position. I assume that the preverbal position in question is inside INFL, as INFL is the only preverbal position outside [VP, S], apart from [NP, S].

Thus, the relevant data in (3-6) could be analysed as follows:

(30)a.



b.



The fact that (30a-b) are unacceptable if the wh-quantifiers remain in the UGP justifies the movement analysis. Presumably, the wh-quantifiers will be raised to COMP in LF by virtue of the COMP-marking +QUAN.

In addition, passivisation offers a further piece of evidence for the analyses in (30). Compare (31) with (32) below and pay attention to the positions of 'dou'(all):

(31)a. Shei dou da-guo Lisi? (wh-interrogative)

who all beat asp ...  
 - Who are all those people who beat Lisi?

b. Lisi dou bei shei da-guo?/\*Lisi bei shei dou da-guo?

... all p.m. who beat asp  
 - By whom was Lisi beaten?

(32)a. Shei dou da-guo Lisi. (wh-quantifier)

who all beat asp ...

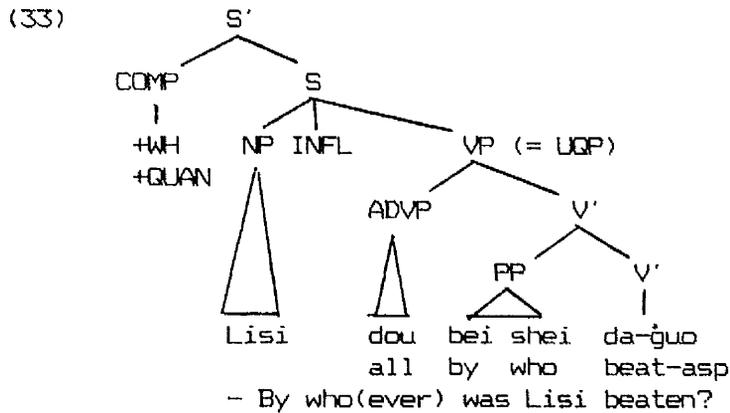
- Everyone beat Lisi.

b. Lisi bei shei dou da-guo./\*Lisi dou bei shei da-guo.

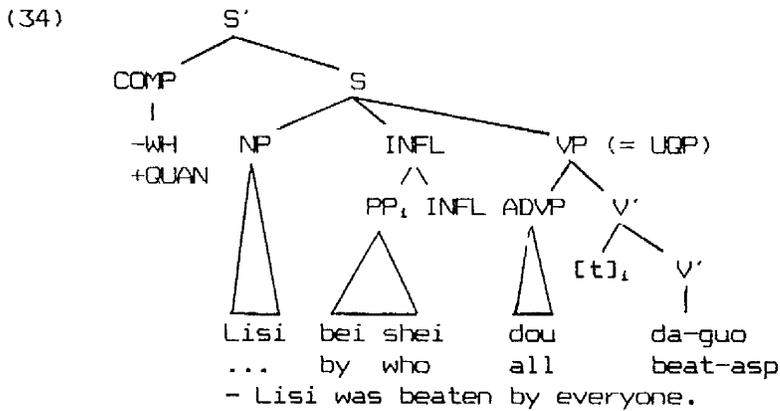
... p.m. who all beat asp

- Lisi was beaten by everyone.

As we see, 'dou'(all) precedes the PP 'bei shei'(by whom) in (31b), but follows this PP in (32b). To capture the contrast between (31b) and (32b), let us first posit that (31b) represents the following structure (ignore the NP-movement in passivisation, for which see 3.3):

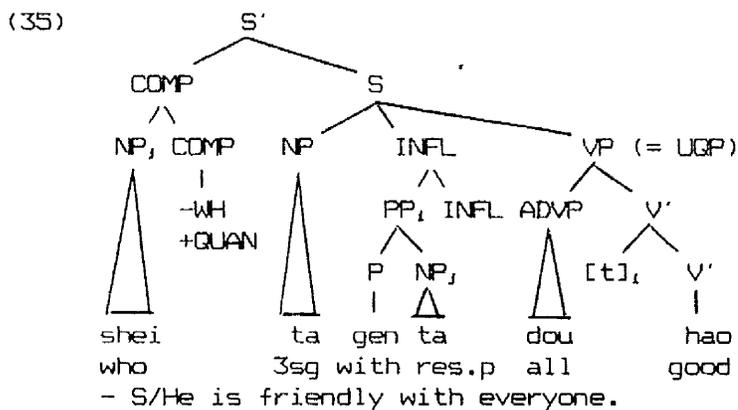


We have observed that the main difference between (31b) and (32b) is that the PP 'bei shei'(by whom) follows the adverb 'dou'(all) in the former but precedes it in the latter. Thus, we may postulate that (32b) is derived from the structure in (33), except that the COMP-marking changes to [-WH, +QUAN], as illustrated in:



Given (33-34), the contrast between (31b) and (32b) seems to have a plausible account. If so, movement of wh-quantifiers into INFL in general as analysed in (30) is justified.

Armed with the analyses in (30), let us return to the case of left dislocation in (28), analysed as follows:



The fact that (35) shares exactly the same reading with (30b), suggests that the former is derived from the latter, hence supporting the left dislocation analysis in (35).

#### 4.4 Binding of Variables

Having examined wh-quantifier constructions in terms of wh-movement in 4.3, let us now consider the binding relation between a moved wh-quantifier and its trace.

Within the generalised binding framework (see 2.4.2), variables must be  $\bar{A}$ -bound. In this respect, we have seen in (20), (24a), (27a) and (30a-b) that a variable resulting from wh-quantifier movement is bound by the moved wh-quantifier in COMP or INFL (NB: like COMP, INFL is also in an  $\bar{A}$ -position). In the following, I shall discuss binding of variables in multi-wh-quantifier constructions.

#### 4.4.1 Multiple wh-quantifiers

Consider:

(36)a. Shei dou xihuan shei.

who all like who

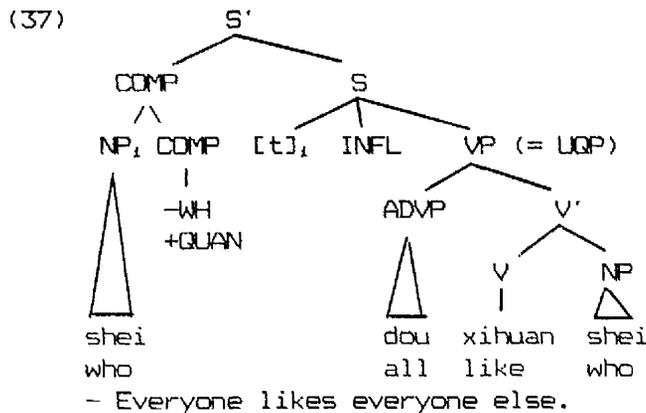
- Everyone likes everyone else.

b. \*Shei shei dou xihuan.

who who all like

Based on the analyses we have given so far to wh-quantifier constructions, the contrast between (36a) and (36b) can be accounted for by the binding of variables in these sentences.

Consider (36a) first, which presumably has the following structure:



In (37), the wh-quantifier in COMP binds the variable in subject position, hence no violation occurs.

Now consider (36b), which is ungrammatical with two wh-quantifiers in a sequence - one is wh-subject and the other wh-object. There are three possible configurations for these two wh-quantifiers in terms of moving into COMP: a) the wh-object is in COMP, but the wh-subject remains in situ, b) both wh-subject and wh-object are in COMP, and c) the wh-subject is in COMP, but the wh-object moves into INFL. Let us consider these possibilities one by one.

#### 4.4.1.1 Binding in LF

With the first possibility in mind, we must take the second 'shei' (who) in (36b) as the wh-subject. Compare (36b) with (38) below:

(38) Shei wo dou xihuan.

who I all like

- I like everyone.

which has a wh-object followed by a non-wh-subject, but is well-formed in contrast to (36b). Presumably, the wh-object in (38) is in COMP but the non-wh-subject is not (see (20)). Then why is (36b), unlike (38), ungrammatical? If the configuration of (36b) is the same as (38), we would expect it to be well-formed and to mean "everyone likes everyone else". As (36b) is not like this, it suggests that it differs from (38) in some way. The difference is of course that (36b) has a wh-subject.

Recall that all quantifiers are assumed to be raised to COMP in LF. So, although (36b) and (38) have the same configuration in Syntax, they differ from each other in LF: (38) will still have one wh-quantifier in COMP, but (36b) will have two wh-quantifiers in COMP. In the case of (38), the wh-object moves into COMP in Syntax (cf. (20)) and presumably remains in COMP in LF; in the case of (36b), the wh-object moves into

COMP in Syntax and the wh-subject is raised to COMP in LF, as in:

(39)a.  $[[_{\text{COMP}} \text{shei}_i ] [ \text{wo dou xihuan } x_i ]]$  (cf. 38)

b.  $*[[_{\text{COMP}} \text{shei}_j \text{shei}_i ] [ x_j \text{ dou xihuan } x_i ]]$  (cf. 36b)

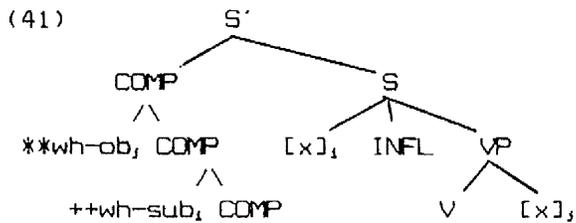
We consider that (39b) is ill-formed, for the trace in subject position is not properly governed or bound. In other words, the ungrammaticality of (36b) is due to having an ill-formed LF structure in (39b). To see why (39b) is ill-formed, and at the same time to demonstrate that (39b) does not mean that a clause is ill-formed if it has two wh-elements in COMP in LF, we need to return to (36a).

(36a), like (36b), contains two wh-quantifiers, which are also supposed to be raised to COMP in LF. But, as (37) shows, the first wh-quantifier in (36a) is not object, but rather subject. Thus, the wh-object will be raised to COMP in LF, as in:

(40)  $[[_{\text{COMP}} \text{shei}_j \text{shei}_i ] [ x_i \text{ dou xihuan } x_j ]]$  (cf. 36a)

Given (39b) and (40), it seems that the order of wh-movement is related to the contrast between them. Why?

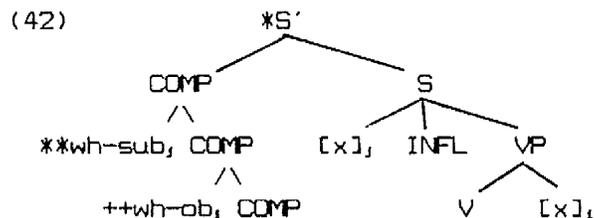
It is not difficult to see the reason. In the standard version of GB where the ECP applies, only a variable in subject position needs proper government, as a variable in object position is properly governed by a verb(/preposition). If a wh-subject moves into COMP before a wh-object, we then have the following structure in LF:



"++" indicates the wh-item which moves into COMP first, and "\*\*" the wh-item that moves into COMP last. These symbols are also employed in a convenient way to which we shall return shortly.

Recall the *that-t* effect we discussed in 1.1 and 2.2.2. The essence of such a phenomenon is that any co-presence of two elements in COMP prevents one of the elements from c-commanding/governing another element outside COMP. And in a *that-t* configuration, it is always the trace that fails to govern a co-indexed trace in subject position. One wonders why this is so.

Let us look at (40) again, now jointly with (41). In order to allow the wh-subject in COMP to govern its trace, we adjust the conditions under which c-commanding/government applies, e.g. by assuming that the wh-subject to which the wh-object adjoins continues to enforce its c-commanding relation to its trace after the adjunction (cf. Horrocks, 1987:142-143). Thus, "\*\*" position becomes one from which c-commanding cannot apply, but not "++" position. We then account for the well-formedness in cases like (36a). In a similar fashion, we may account for the ill-formedness of (36b), re-represented in:



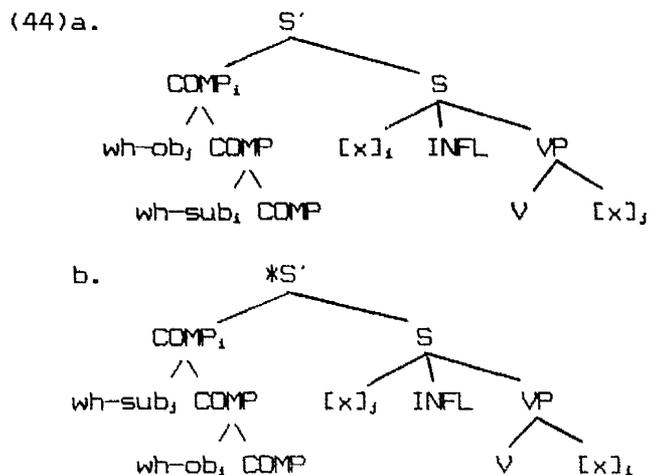
For (42), because wh-subject in "\*\*" position cannot c-command its trace, the structure violates the ECP, hence the ungrammaticality.

Returning to the *that-t* effect, we therefore see why a trace in a filled COMP fails to govern a co-indexed trace in subject position, because it is in "\*" position due to the fact that the COMP is already filled by a complementiser (NB: the *t-that* effect would be a more appropriate term). At this point, since the *that-t* effect is absent in Chinese (cf. 2.2.2), one might ask why (42) is ruled out. It is worth noting that (42) is not a case of the *that-t* effect, though analogous to it.

A more visible approach is adopted in the generalised binding theory we are currently employing (see 2.4.2). This theory proposes the following COMP-indexing rule which applies where there is syntactic wh-movement (Aoun, Hornstein and Sportiche, 1981; Aoun, 1986:10):

- (43) [COMP ... XP<sub>i</sub> ...] => [COMP<sub>i</sub> ... XP<sub>i</sub> ...]  
 iff COMP contains *i*-indexed elements only

(43) states that once an item moves into COMP, COMP will be co-indexed with that item. After application of (43), we may reproduce (41) and (42) respectively in (44a) and (44b) below:



As we see, (44b) is barred because the wh-subject cannot govern or bind

its trace.

One question, certainly, is why (44a) is considered well-formed even though the wh-object fails to bind its trace, given that the generalised binding theory requires that a variable must be bound. In fact, this is one major question faced by the proponents of this theory. In Aoun (1986), two approaches have been suggested. One is to propose that wh-Raising in LF adjoins to S' instead of to COMP. This approach involves a great deal of theoretical complication and consequences, which are not directly related to this thesis. The second approach compromises with the ECP, as it is practised in (44a-b). That is, it incorporates the COMP-indexing rule in the ECP. Thus, the trace of the wh-object need not be bound, as it is properly governed by the V. As this approach is adequate for the purpose of our current discussion, I do not intend to bring in other issues.

#### 4.4.1.2 Doubly-filled COMP Filter

We now come to the second possibility regarding (36b): both wh-quantifiers are in COMP. Under this assumption, we have the following S-structures:

(45)a. \*[[<sub>COMP</sub> shei<sub>i</sub> shei<sub>i</sub> ] [ t<sub>i</sub> dou xihuan t<sub>j</sub> ]]

b. \*[[<sub>COMP</sub> shei<sub>i</sub> shei<sub>i</sub> ] [ t<sub>j</sub> dou xihuan t<sub>i</sub> ]]

Both (45a) with wh-subject moving into COMP before wh-object, and (45b) with the movement order reversed are barred for violation of the doubly-filled COMP filter (Chomsky & Lasnik, 1977).

As we see in 4.4.1.1, in LF where all wh-elements are raised to

COMP (for interpretative purposes), the order of wh-movement plays a part in explaining any violation at this level. But at S-structure which is mapped to LF as well as to PF (phonetic forms), any co-presence of two wh-elements in COMP, irrespective of order of wh-movement, is ill-formed. The doubly-filled COMP filter captures this fact.

It is vitally important to note, however, that the doubly-filled COMP filter focuses on the co-presence of two wh-elements in COMP both resulting from wh-movement. This is to say that the co-presence of two wh-elements in COMP is allowed if only one of them is raised to COMP by wh-movement. We shall discuss this further in the following section.

#### 4.4.1.3 Double Wh-movement Constraint

Finally, let us consider the third possibility regarding (36b), for which we take the first 'shei'(who) as the wh-subject in COMP, and the second 'shei'(who) as the wh-object in INFL. In other words, both wh-quantifiers have moved, though not into the same position.

Then compare (36b) with (46) below:

(46) Wo, shei dou xihuan.

I who all like

a. - As for me, I like everyone.

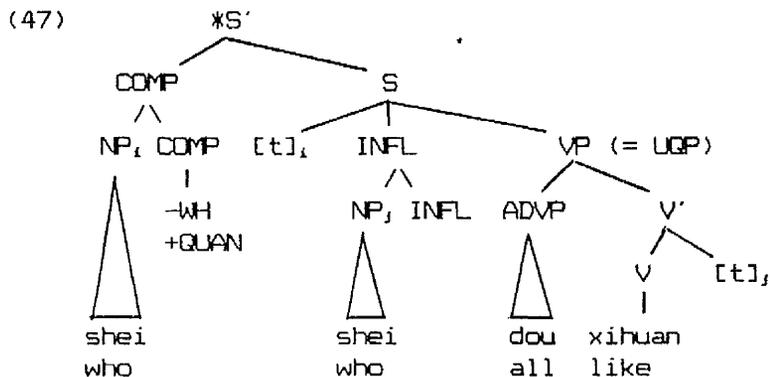
b. - As for me, everyone likes me.

Apparently, 'wo'(I/me) in (46) may function either as subject or as object. In either case, 'wo'(I/me) is topicalised. But it is the former case that we are concerned with at the moment. We choose a topicalised subject because, in this way, (46) would be parallel to (36b) in terms of our current assumption, i.e. the subject is in COMP and the object in INFL (given the fact that 'shei'(who) occurs before

'dou'(all) (cf. (30a)).

Under our chosen configuration, (46) carries the interpretation in (46a). Then, since (36b) shares the same configuration and has a wh-quantifier subject, we would expect it to mean "everyone likes everyone else". But, instead, (36b) is ungrammatical. Why?

In (36b), wh-movement applies to both wh-subject and wh-object; in (46), however, wh-movement applies only to the wh-object, and topicalisation applies to the non-wh-subject. Obviously, the difference lies in the fact that (36b) involves a double wh-movement (from D- to S-structure), but (46) has only one wh-movement (topicalisation, though subject to the subjacency condition, is not a D-to-S-structure operation, but one at S-structure). Then the question becomes what in our grammar will prevent (36b) from being derived, as in:



Note that both variables in (47) are bound, nevertheless, (47) is ill-formed. Thus, it appears necessary to formulate a condition, informally, as follows:

(48) No wh-movement applies more than once in a S (or NP) in Syntax.

For presentation reasons, I shall call (48) the "double wh-movement constraint" (henceforth, DWC).<17>

The DWC thus rules out (47) as a grammatical string. It in fact subsumes the effect of the double-filled COMP filter, which is only responsible for double wh-movements into COMP, but excludes (or misses) those which are not into COMP, or which are into two separate categories, such as COMP and INFL as we see in (47).

There is solid evidence for the DWC. Firstly, it accounts for the contrast between (36b) and (46) in either interpretation. (The reader can easily see this without my going into detailed discussion). Secondly, it accounts for the contrast between (36b) and (36a): the former involves double wh-movements (cf. 47), hence violating the DWC and being ungrammatical, but the latter has only one wh-movement (cf. 37), hence complying with the DWC and being acceptable. Thirdly, it accounts for the contrast between (36b) and the type of data in (49) below, showing interactions of wh-interrogatives with wh-quantifier expressions:

(49) Shei shei dou xihuan? (cf. 36b)

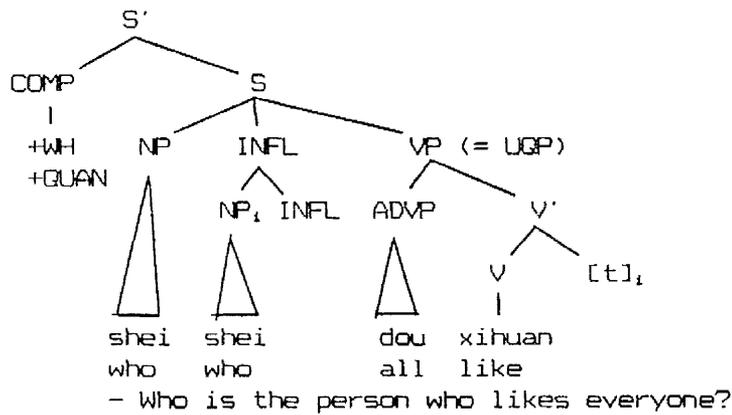
who who all like

- a. - Who is the person who likes everyone?
- b. - Who is the person who everyone likes?

One basic fact about (49) is that, under either interpretation, the first wh-item must be an interrogative item (= who), though (49a) requires it to be the subject, and (49b) requires it to be the object.

Under the interpretation of (49a), for which the first 'shei' (who) is the subject and an interrogative item, and the second 'shei' (who) is the object and a wh-quantifier, we may then have:

(50)



In (50), the wh-subject (= who) remains in situ, but the wh-object (= everyone) moves into INFL, thus giving a plausible structural account for the relevant interpretation.

Now consider the interpretation of (49b), for which the first 'shei' (who) is the object and an interrogative item, and the second 'shei' (who) is the subject and a wh-quantifier. There are two basic points involved in this case. Firstly, although interrogative wh-items in Chinese remain in situ, they can be topicalised (cf. (26)), e.g.

(51)a. Ni renshi shei?

you know who

- Whom do you know?

b. Shei(,) ni renshi?

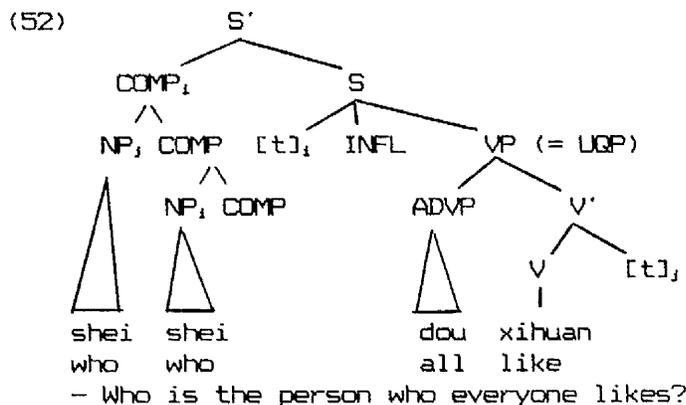
who you know

- Whom do you know?

The important fact about (51) is that wh-movement does not apply in these sentences (recall the English equivalent to (51a) in (19a) of 1.1, where wh-movement has to apply). So, for (49) under the reading of (49b), the wh-object (= an interrogative) appears in the clause initial position by topicalisation.

Secondly, the wh-subject as a wh-quantifier in (49b) must undergo wh-movement.

As just stated above, wh-movement applies from D- to S-structure, and topicalisation applies at S-structure. This means that, for (49) under the reading of (49b), the subject (= wh-quantifier) moves into COMP before the object (= wh-interrogative), as illustrated in:



As demonstrated in (41/44) of 4.4.1.1, as long as a wh-subject moves into COMP before a wh-object, the resultant structure will be well-formed as far as binding of variables is concerned (see the relevant part of 4.4.1.1 for detailed discussion, which I shall not repeat here). So (52) is sound in terms of binding.

The only other issue concerning (52) is that it contains two wh-elements in COMP, seemingly violating the doubly-filled COMP filter. But as I noted in 4.4.1.2, the doubly-filled COMP filter has an effect solely on the co-presence of two wh-items in COMP by wh-movement (data on the basis of which this filter is formulated are uniformly related to wh-movement; cf. Chomsky and Lasnik, 1977). It does not, and should not, mean that any co-presence of two wh-items in COMP is barred. The fact is that the co-presence of two wh-items in COMP is allowed if only one of them is raised to COMP by wh-movement. The well-formedness of (52) evidently argues for this. So, in fact, the effect of the doubly-filled COMP filter is better and more precisely captured by the newly formulated DWC.

Now, if we compare (47), which represents (36b), with (50 + 52), which represent (49) in both readings, it is clear that although there are two wh-items in sequence in the clause initial position in each case, (47) is ill-formed because it violates the DWC, but (50) and (52) are acceptable because they obey the DWC.

It is possible that the DWC may act as a universal principle. Toman (1982) demonstrates that the notion of "multiple wh-movement" in Slavic languages (e.g. Polish and Czech), due to Wachowicz (1974), may not be correct, because wh-items in these languages can replace pronouns. That is, when two wh-items appear in clause initial position, there is only one of them which results from wh-movement, and the other is an outcome of pronoun replacement. This situation is parallel in principle to what we have seen in Chinese in the above: when two wh-items appear in clause initial position (cf. (50) & (52)), one is derived by wh-movement, and the other by topicalisation; if both wh-items are involved in wh-movement, ungrammaticality arises (cf. (47)).

#### 4.4.2 Adjuncts vs. Non-adjuncts

In this section, I discuss briefly the difference between adjuncts and non-adjuncts and binding of variables of wh-quantifiers that are adjuncts.

For the purpose of discussion in this section, adjuncts are defined as elements which are sisters to VP, except for subjects, and non-adjuncts are subjects and complements (cf. Aoun, 1986).

In Huang (1982b), 'zenme' (how) and 'weishenme' (why) are identified as the only adjuncts as far as wh-items in Chinese are concerned. In fact, there is still a difference between the two:

(53)a. Ni zenme qu Beijing?

you how go Peking

- How will you go to Beijing?

b. \*Zenme ni qu Beijing? <16>

how you go Peking

(54)a. Ni weishenme qu Beijing?

you why go Peking

- Why will you go to Beijing?

b. Weishenme ni qu Beijing?

why you go Peking

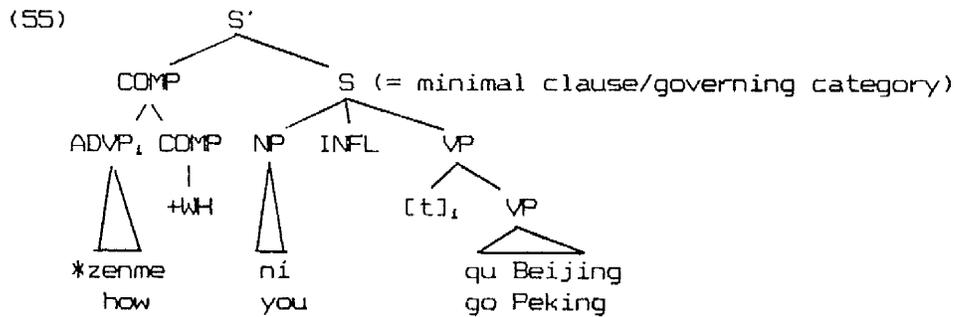
- Why will you go to Beijing?

If we assume that a non-adjunct may be freely topicalised, but an adjunct may not, then (53-54) show that 'zenme' (how) is an adjunct, but 'weishenme' (why) is not.

This is hardly surprising, as 'weishenme' (why) is in fact 'wei' (for) plus 'shenme' (what). 'Weishenme' is thus on a par with 'shenmeshihou' (what + time, i.e. when) and 'shenmedifang' (what + place, i.e. where), which are identified as non-adjuncts and which in usage appear as a complement of the preposition 'ZAI' (at/in). As a matter of fact, all wh-items in Chinese except 'zenme' (how) may pass the "free-topicalisation" test such as in (53-54) (data showing this are omitted here). Thus, for the discussions that follow, I shall only use 'zenme' (how) as an example of wh-adjunct in Chinese, without engaging in further identification of such items.

Given (53), we may ask why (53b) is ill-formed. According to Aoun (1986:2, 32-33), variables left behind by adjuncts must be locally bound (i.e. in the minimal clauses in which variables appear). Thus, (53b) is accounted for in that the variable of 'zenme' (how) is not

locally bound:



In (55), the S is taken as the governing category for the variable. In this governing category, the variable does not have a binder, thus violating the generalised binding theory, hence the ungrammaticality.

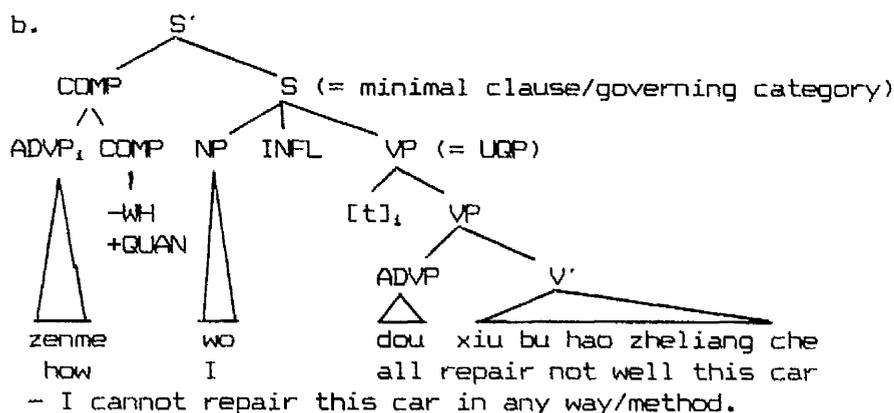
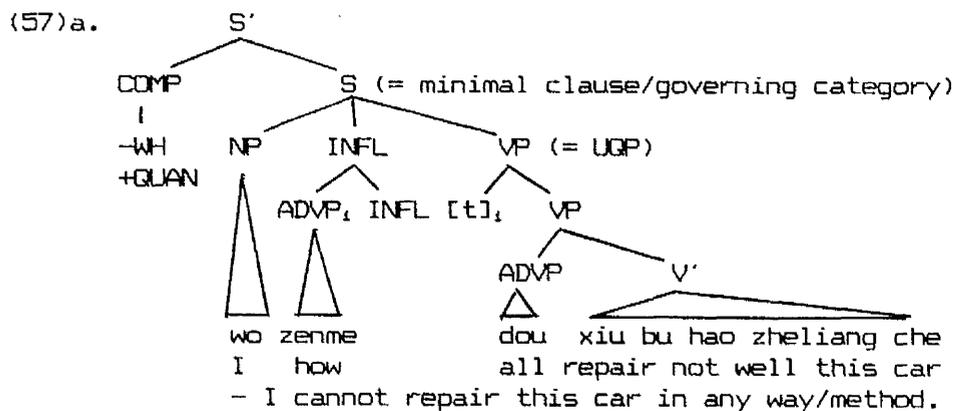
It is worth noting the argument for accounting for (55). Given that the sentence is ungrammatical, if we take the S' as the governing category, there will be no violation and we offer no account for (55). Besides, contrastingly, we have seen in previous analyses (cf. 4.3) that a S' is taken as the governing category for a variable in a non-adjunct position, e.g. object position. Thus, (55) is justified.

Now let us compare (53) with the wh-quantifier expressions containing 'zenme' (how) in:

- (56)a. Wo zenme dou xiu bu hao zheliang che.  
 I how all repair not well this car  
 - I cannot repair this car in any way/method.
- b. Zenme wo dou xiu bu hao zheliang che.  
 how I all repair not well this car  
 - I cannot repair this car in any way/method.

(56), in contrast to (53), shows that 'zenme' (how) can be freely topicalised when functioning as a wh-quantifier (= anyhow).

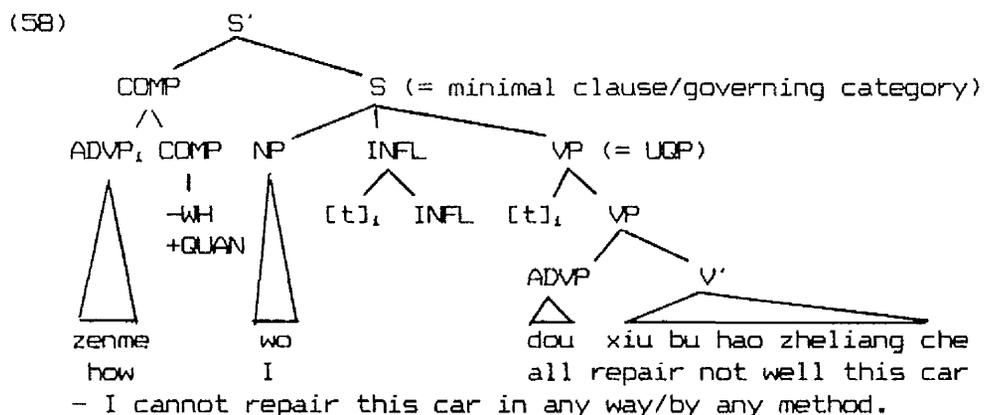
On the basis of the analyses for wh-quantifiers in 4.3.1 and 4.3.2, we may first analyse (56a-b) as follows:



Namely, 'zenme' (anyhow) moves either into INFL (57a) or COMP (51b), in agreement with other wh-quantifiers moving out of VP. However, because 'zenme' (anyhow) is an adjunct (i.e. a sister to VP), its movement into INFL is opaque and cannot be read off surface structure. Moreover, because 'zenme' (anyhow) is in an adjunct position, we cannot even test whether the wh-movement is obligatory (as we see in (56), both the possible positions for 'zenme' (anyhow) are grammatical). Nevertheless, on the basis of the evidence for other wh-quantifiers we have examined so far in this chapter, it is not implausible to believe that the analyses in (57) are sound as far as the structures are concerned.

Now for the issue of binding. (57a) is well-formed as the variable is bound by the wh-quantifier in INFL. But problems arise with (57b): the variable is not bound, violating the generalised binding condition. Given that the sentence is acceptable, modifications are called for in

our analyses. In order to bind the variable, I propose that the wh-movement in (57a) occurs via INFL, leaving a co-indexed trace binding the variable in the adjunct position:



The variable in INFL binds the one in the adjunct position and is in turn bound by the wh-quantifier in COMP. (58) then has no violation, hence the well-formedness.

Given (58), it is clear that it is a trace in an adjunct position (= a sister to VP) rather than a trace of an adjunct in general, that should be bound in the minimal clause in which the trace occurs; if a trace of an adjunct occurs in a non-adjunct position, such as the one in INFL in (58), it need not be bound in the minimal clause (NB: under our current definition, an adjunct position is a sister to VP).

There is no direct evidence for the via-INFL movement in (58). But, if we compare (58) with (55) which accounts for a wh-interrogative, and raise the question as to why the same process may not apply to (55), or indeed what prevents it from applying to (55), we may obtain some indirect evidence. Supposing that the same via-INFL movement occurred in (55), the variable would then be bound as it is in (58). But why does this not occur? There are two separate issues here. Firstly, if this occurs, a flawed process will be at work, because the sentence in (55) is ungrammatical, suggesting that it should not occur. The second issue

concerns two points. Firstly, (55) is a wh-interrogative; so, wh-in-situ, not wh-movement, should apply. Therefore, there is no point in the wh-item in (55) moving into INFL or COMP at all. Related to this, secondly, the movement in (55) is topicalisation, for which to the best of my knowledge there is no evidence in Chinese that it is via INFL. In contrast, wh-movement must apply to the wh-quantifier in (58), and all the evidence given in this chapter suggests that this movement can terminate either in COMP or INFL. Thus it is not completely implausible that in the case of wh-adjuncts such as (58), the wh-movement may be via INFL.

Notes:

<1> The negation morpheme for the perfective aspect is the item 'mei' (not), instead of 'bu' (not) used in other cases. The item 'you' (meaning "to have" when used independently) is treated in W. Wang (1965) as a variant of the perfective aspect marker Le, with Le used in an affirmative sentence, and 'you' in a negative one. The defect of this treatment is that while Le is suffixed to verbs, 'you' seems to be suffixed to the negation morpheme 'mei' (not) (cf. Teng, 1973). Taking into account also the fact that 'you' is optional in negation, as shown below, it is even less likely to be an aspect marker (which is normally obligatory as its function requires), but possibly an auxiliary (D. Bennett, personal communication), e.g.

- (i) bu lai - will/do not come  
not come

(ii) mei(-you) lai - have/did not come

not have come

<2> Acceptable when the wh-item is interrogative.

<3> The same as <2>.

<4> The same as <2>.

<5> The same as <2>.

<6> The same as <2>.

<7> The same as <2>.

<8> The same as <2>.

<9> The same as <2>.

<10> The same as <2>.

<11> The same as <2>.

<12> The same as <2>.

<13> The same as <2>.

<14> What precisely these selection restrictions are is an issue that needs to be better understood in general.

<15> According to van Riemsdijk and Williams (1985:28-29), in a language where preposition stranding is impossible, "pied piping" (Ross, 1967) of Ps is obligatory, as in German, French and Russian. Whether this prediction is also true in Chinese needs separate studies.

<16> In fact, (53b) is acceptable when 'zenme' is used as a variant of 'weishenme' (why), especially in the Peking dialect. This provides extra evidence for the contrast between (53) and (54).

<17> It is worth noting that since wh-in-situ applies in interrogatives in Syntax in Chinese, multiple wh-questions like those below would violate different principles from (48) if the co-presence of two wh-items causes any ill-formedness:

(i)a. Shei da-le shei?

who hit-asp who

- Who hit whom?

b. shei<sub>i</sub>, shei da-le t<sub>i</sub>?

who who hit-asp

- Who hit whom?

c. \*shei shei<sub>i</sub> da-le t<sub>i</sub>?

who who hit-asp

The descriptive generalisation based on (i) seems to be that topicalisation of a wh-object to the preverbal position is barred (i)c, though it is possible to the clause initial position (i)b. Further data with a non-wh-object produce the same result:

(ii)a. Shei da-le Zhangsan?

who hit-asp ...

- Who hit Zhangsan?

b. Zhangsan<sub>i</sub>, shei da-le t<sub>i</sub>?

... who hit-asp

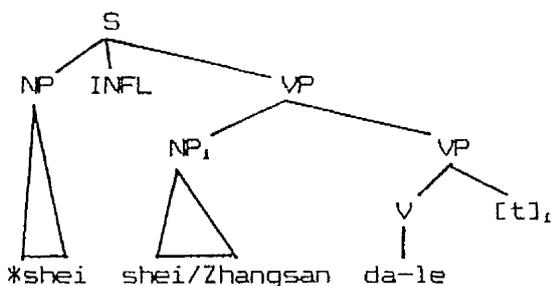
- Who hit Zhangsan?

c. \*shei Zhangsan<sub>i</sub> da-le t<sub>i</sub>?

who ... hit-asp

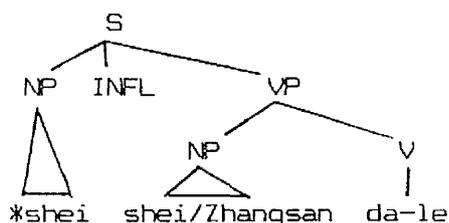
To explain (i)c and (ii)c, we find that they do not violate Binding Condition A (of (111) of 2.4.2) if there is a topicalisation as we have assumed:

(iii)



The only explanation therefore is that there is in fact no topicalisation in (iii), and that the preverbal wh-object is not Case-marked, hence the ungrammaticality:

(iv)



To save (iv), we may thus apply BA-insertion:

(v) Shei ba shei/Zhangsan da-le?

who ob.m who/... hit-asp

- Who hit whom/Zhangsan?

The fact that (v) is well-formed in contrast to (i)c and (ii)c suggests again that there is no topicalisation in the latter two cases, as topicalisation has to occur after Case-marking, such as in (i)b and (ii)b.

Finally, it may as well be worth noting that multiple wh-interrogatives in Chinese seem to retain the Superiority Effects (Aoun and Sportiche, 1981; Chomsky, 1986b) in the same way as multiple wh-quantifiers do (cf. 4.4.1.1).

For a multiple wh-question in (i)a, though the wh-items remain in situ in Syntax, they are presumably raised to COMP in LF. There are

two possible configurations as a result of this:

(vi)a. [shei, shei, [ t<sub>i</sub> da-le t<sub>j</sub> ]

who who hit-asp

- Who is the person x such that hit a person y?

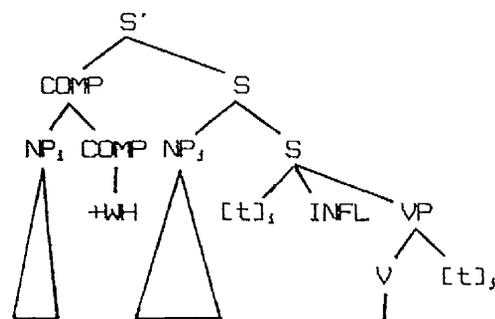
b. \*[shei, shei, [ t<sub>i</sub> da-le t<sub>j</sub> ]

who who hit-asp

(vi)b is ruled out, as the wh-subject in COMP fails to bind its trace, hence in line with the Superiority Effects.

If (vi)a-b are correct, which I believe is so (NB: the syntactic wh-quantifier movement provides a piece of closely related evidence for this; see 4.4.1.1), there are two further consequences. Firstly, INFL in Chinese cannot be a proper governor as Huang (1982b) speculated, because if it is, (vi)b would also be acceptable, and the difference (in configuration) between (vi)a and (vi)b would be one without a distinction. Secondly, topicalisation to clause initial position is likely to S-joined position rather than to COMP, because in this way a topicalised (wh-)object will not prevent the raised wh-subject from binding its trace in LF, as in (taking (i)b and (ii)b as an example):

(vii)



shei shei/Zhangsan da-le  
 who who/... hit-asp  
 - Who is the person x such that hit a person y/Zhangsan?



in discussion between the speaker and the hearer. To illustrate this, compare the following relative clauses in slashes with the descriptive clauses in (1):

(2)a. Wo you yi-ge /xihuan yinyue de/ pengyou.

V            NP            NP

I have one-m.p like music Comp friend

- I have a friend who likes music.

b. Wo kan-le yi-ge /hen you qu de/ dianying.

V   NP            NP

I see-asp one-m.p very have interest Comp film

- I saw a film that was very interesting.

c. Wo renshi yi-ge /hui da Taijiquan de/ ren.

V            NP            NP

I know one-m.p can play shadow-boxing Comp person

- I know someone who can do Taichi.

d. Ta mai-le yi-ge /hen zhi qian de/ huaping.

V   NP            NP

3sg buy-asp one-m.p very worth money Comp vase

- S/He bought a vase that was very valuable.

Syntactically, there are both similarities and differences between descriptive and relative clauses. In terms of similarity, both types of clause must have an empty grammatical position depending on the antecedent relation between the item they modify and that grammatical position in their own clause. We have seen in (1-2) that the subject of the descriptive and relative clauses is missing. The data in (3-6) further show a missing object/premodifier in both types of clause - (3-4) are descriptive clauses and (5-6) relative clauses:

(3)a. Wo you yi-ge pengyou /Zhangsan xihuan/.

NP            NP            V

I have one-m.p friend ... like

- I have friend, who Zhangsan likes.

- b. Wo xie-le yi-ben shu /Lisi kan-bu-dong/.  
 NP NP V  
 I write-asp one-m.p book ... read not understand  
 - I wrote a book, which Lisi cannot understand.
- (4)a. Ta kai-le yi-ge fanguan /shengyi hen hao/.  
 NP NP V  
 3sg open-asp one-m.p restaurant business very good  
 - He has opened a restaurant, whose business is very good.
- b. Ta mai-le yi-liang che /zhiliang bu cuo/.  
 NP NP V  
 3sg buy-asp one-m.p car quality not bad  
 - He has bought a car, whose quality is not bad.
- (5)a. Wo you yi-ge /Zhangsan xihuan de/ pengyou. (cf. (3a))  
 NP V NP  
 I have one-m.p ... like Comp friend  
 - I have a friend who Zhangsan likes.
- b. Wo xie-le yi-ben /Lisi kan-bu-dong de/ shu. (cf. (3b))  
 NP V NP  
 I write-asp one-m.p ... read not understand Comp book  
 - I wrote a book which Lisi cannot understand.
- (6)a. Ta kai-le yi-ge /shengyi hen hao de/ fanguan. (cf. (4a))  
 NP V NP  
 3sg open-asp one-m.p business very good Comp restaurant  
 - He has opened a prosperous restaurant.
- b. Ta mai-le yi-liang /zhiliang bu cuo de/ che. (cf. (4b))  
 NP V NP  
 3sg buy-asp one-m.p quality not bad Comp car  
 - He has bought a car of good quality.

The syntactic distinction between a descriptive clause and a relative clause, however, is, firstly, that the former always follows the item that it modifies (1), whereas the latter always precedes the item (2). Secondly, the former does not contain the complementiser 'De' (1), whereas the latter must have it (2). Thirdly, the former differs from the latter in distribution. A relative clause can occur in subject or object position, for example,

(7)a. Nage /xihuan Zhangsan de/ pengyou si-le.

that like ... Comp friend die-asp

- The friend who liked Zhangsan has died.

b. Wo renshi yi-ge /xihuan Zhangsan de/ pengyou.

I know one-m.p like .. Comp friend

- I know a friend who likes Zhangsan.

c. Wo gei yi-ge /xihuan Zhangsan de/ pengyou da dianhua.

I to one-m.p like ... Comp friend make telephone-call

- I telephone a friend who likes Zhangsan.

But a descriptive clause can only occur after the object of a transitive verb. Compare the following with (7):

(8)a. \*Nage /xihuan Zhangsan/ pengyou si-le.

that like ... friend die

b. Wo renshi yi-ge pengyou /xihuan Zhangsan/.

I know one-m.p friend like ...

- I know a friend, who likes Zhangsan.

c. \*Wo gei yi-ge pengyou /xihuan Zhangsan/ da dianhua.

I to one-m.p friend like ... make telephone-call

Fourthly, a pause is allowed between a descriptive clause and the item it modifies. This includes two situations. If the item modified by a descriptive clause does not have a definite reference, a pause is optional, e.g.

(9)a. Wo you yi-ge pengyou(,) xihuan yinyue. (cf. (1a))

I have one-m.p friend like music

- I have a friend, who likes music.

b. Wo renshi yi-ge ren(,) hui da Taijiquan. (cf. (1b))

I know one-m.p person can play shadow-boxing

- I know a person, who can do Taichi.

But if the item modified by a descriptive clause has a definite reference, a pause is obligatory, as in:

(10)a. Wo gan-guo zhege gongzuo, bu tai nan.

I do-asp this work not too difficult

- I did this work, which was not too difficult.

b. \*Wo gan-guo zhege gongzuo bu tai nan.

I do-asp this work not too difficult

(11)a. Wo kan-guo nage dianying, hen you qu.

I see-asp that film very have interest

- I saw that film, which was very interesting.

b. \*Wo kan-guo nage dianying hen you qu.

I see-asp that film very have interest

In contrast, a pause is never possible between the head noun and a relative clause, regardless of whether or not the head noun has a definite reference, e.g.

(12)a. \*Wo renshi nage xihuan yinyue de, laoshi.

I know that like music Comp teacher

b. \*Wo kan-le yi-ge hen you qu de, dianying.

I see-asp one-m.p very have interest Comp film

Fifthly, the missing grammatical position(s) in a descriptive clause can be reinstated by an overt form, e.g.

(13)a. Wo kan-le yi-ge dianying, /nage dianying/ hen you qu. (cf. (1b))

I see-asp one-m.p film that film very have interest

- I saw a film, which was very interesting.

b. Ta mai-le yi-ge huaping, /nage huaping/ hen zhi qian. (cf. (1d))

3sg buy-asp one-m.p vase that vase very worth money

- S/He bought a vase, which was very valuable.

(14)a. Wo you yi-ge pengyou, Zhangsan xihuan /ta/. (cf. (3a))

I have one-m.p friend ... like 3sg

- I have a friend, who Zhangsan likes.

b. Wo xie-le yi-ben shu, Lisi kan bu dong /ta/. (cf. (3b))

I write-asp one-m.p ... read not understand 3sg

- I wrote a book, which Lisi cannot understand.

(15)a. Ta kai-le yi-ge fanguan, /fanguan-de/ shengyi hen hao. (cf.(4a))

3sg open-asp one-m.p restaurant restaurant's business very good

- He has opened a restaurant, whose business is good.

b. Ta mai-le yi-liang che, /che-de/ zhiliang bu cuo. (cf. (4b))

3sg buy-asp one-m.p car car's quality not bad

- He has bought a car, whose quality is not bad.

But the missing subject/object/premodifier in a relative clause can never be reinstated by an overt form, e.g.

(16)a. \*Wo kan-le yi-ge [/nage dianying/ hen you qu de] dianying.

I see-asp one-m.p that film very have interest Comp film

b. \*Ta mai-le yi-ge [/nage huaping/ hen zhi qian de] huaping.

3sg buy-asp one-m.p that vase very worth money Comp vase

(17)a. \*Wo you yi-ge [Zhangsan xihuan /ta/ de] pengyou.

I have one-m.p ... like 3sg Comp friend

b. \*Wo xie-le yi-ben [Lisi kan bu dong /ta/ de] shu.

I write-asp one-m.p ... read not understand 3sg Comp book

(18)a. \*Ta kai-le yi-ge [/fanguan-de/ shengyi hen hao de] fanguan.

3sg open-asp one restaurant's business very good restaurant

\*Ta mai-le yi-liang [/che-de/ zhiliang bu cuo de] che.

3sg buy-asp one-m.p car's quality not bad car

Based on all the above comparative data between descriptive clauses and relative clauses, we may sum up: a) both types of clause modify

NPs; b) relative clauses precede the NPs they modify, and descriptive clauses follow the NPs they modify; c) this word order difference seems to be related to the facts that relative clauses need to contain the complementiser 'De', that there is a difference between relative clauses and descriptive clauses in distribution, that a pause is allowed between descriptive clauses and the NPs they modify, and that the empty grammatical positions in descriptive clauses can be reinstated; d) given these facts, the word order difference between relative and descriptive clauses signals a further difference in structure between these two types of clause in relation to the NPs they modify.

In the next two sections, I shall examine the internal structure of both descriptive and relative clauses, and then analyse the overall structure of the descriptive clause construction.

## 5.2 Empty Operator Movement

### 5.2.1 Descriptive Clauses

We have seen that descriptive clauses contain an empty subject/object/premodifier ((1) and (3-4)). The fact that these empty positions can be reinstated by a lexical NP (13-15) argues against their being a PRO. They are also unlikely to be pro, which occurs in subject position only (see 2.2.3). The only option left is trace, which in this case appears to be a variable for the existence of the following type of data, in which unbounded dependency (= successive cyclicity of wh-movement) is observed in descriptive clauses. Consider:

(19)a. Lisi you yi-ge meimei /wo zhidao xihuan Zhangsan/.

... have one-m.p sister I know like ...

- Lisi has a sister, who I know likes Zhangsan.

b. Lisi you yi-ge meimei /wo xiang ta zhidao xihuan Zhangsan/.

... have one-m.p sister I think 3sg know like ...

- Lisi has a sister, who I think he knows likes Zhangsan.

(20)a. Lisi xie-le yi-ben shu /wo shuo Zhangsan kan-bu-dong/.

... write-asp one-m.p book I say ... read not understand

- Lisi wrote a book, which I said that Zhangsan could not understand.

b. Lisi xie-le yi-ben shu /wo zhidao ta shuo Zhangsan kan-bu-dong/.

.. write-asp one-m.p book I know 3sg say .. read not understand

- Lisi wrote a book, which I know he said Zhangsan could not understand.

(21)a. Ta kai-le yi-ge fanguan /wo kan shengyi hen hao/.

3sg open-asp one-m.p restaurant I see business very good

- He has opened a restaurant, whose business I think is good.

b. Ta kai-le yi-ge fanguan /wo ting Lisi shuo shengyi hen hao/.

3sg open-asp one-m.p restaurant I hear .. say business very good

- He has opened a restaurant, whose business I heard Lisi say is good.

As we see, unbounded dependency seems to occur in the descriptive clauses in (19-21): at subject position in (19), object position in (20) and premodifier position in (21). This suggests an empty operator movement, as there is no overt operator that can be identified in these clauses. If so, we may first give the following analysis:

(22)a. Lisi you yi-ge meimei<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> [<sub>s</sub> t<sub>i</sub> xihuan Zhangsan]]

... have one-m.p sister like ...

- Lisi has a sister, who likes Zhangsan.

b. Lisi you yi-ge meimei<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> [<sub>s</sub> Zhangsan xihuan t<sub>i</sub> ]]

... have one-m.p sister ... like

- Lisi has a sister, who Zhangsan likes.

c. Lisi mai-le yi-liang che<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> [<sub>s</sub> t<sub>i</sub> zhiliang bu cuo]]

... buy-asp one-m.p car quality not bad

- Lisi has bought a car, whose quality is not bad.

(22) postulates that an empty operator moves into COMP from subject/object/premodifier position of a descriptive clause <2>.

Armed with (22), the unbounded dependency in (19-21) can be accounted for as follows:

(23)a. Lisi you yi-ge meimei<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> [<sub>s</sub> wo xiang [<sub>s</sub> t<sub>i</sub>



... have one-m.p sister I think

[<sub>s</sub> ta zhidao [<sub>s</sub> t<sub>i</sub> [<sub>s</sub> t<sub>i</sub> xihuan Zhangsan ]]]]]]



3sg know like ...

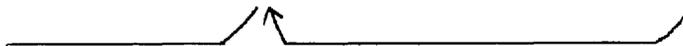
- Lisi has a sister, who I think he knows likes Zhangsan.

b. Lisi xie-le yi-ben shu<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> [<sub>s</sub> wo zhidao [<sub>s</sub> t<sub>i</sub>



... write-asp one-m.p book I know

[<sub>s</sub> ta shuo [<sub>s</sub> t<sub>i</sub> [<sub>s</sub> Zhangsan kan-bu-dong t<sub>i</sub> ]]]]]]



3sg say ... read-not-understand

- Lisi wrote a book, which I know he said Zhangsan could not understand.

c. ta kai-le yi-ge fanguan<sub>i</sub> [<sub>g</sub>. OP<sub>i</sub> [<sub>g</sub>. wo ting [<sub>g</sub>. t<sub>i</sub>



3sg open-asp one-m.p restaurant I hear  
 [<sub>g</sub>. Lisi shuo [<sub>g</sub>. t<sub>i</sub> [<sub>g</sub>. t<sub>i</sub> shengyi hen hao]]]]]]



... say business very good  
 - He has opened a restaurant, whose business I heard Lisi  
 say is good.

Under the subjacency condition (see 1.1), the empty operator in (23) moves cyclically, as the arrow indicates, into the COMP immediately following its antecedent. I regard the analyses in both (22) and (23) as being self-evident by virtue of the data they account for, though further evidence will be discussed later in 5.2.3.

Moreover, consider the binding of the variable in (22-23). In (22), the variable is bound by the empty operator in S', which is then the governing category for the variable (recall that the binder of a variable in Chinese functions as an accessible SUBJECT; see 2.4.2). In (23), the governing category is the least S' containing the variable, which is bound by the co-indexed trace. Thus, the OP-movement in (23) is successive-cyclic (cf. 2.4.2).

### 5.2.2 Relative Clauses

Now let us examine relative clauses. Data showing unbounded dependency in relative clauses are such as:

(24)a. /wo renshi de/ nage ren ...  
 I know Comp that person  
 - the person who I know ...

b. /ni shuo wo renshi de/ nage ren ...

you say I know Comp that person

- the person who you say I know ...

c. /ta renwei ni shuo wo renshi de/ nage ren ...

3sg think you say I know Comp that person

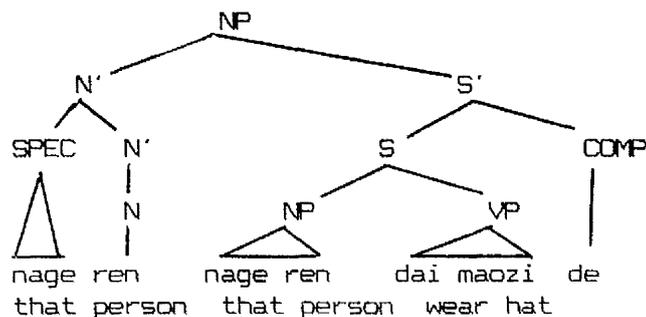
- the person who s/he thinks you say I know ...

Radford (1981:275) suggests that given the fact that Chinese relatives do not contain overt relative pronouns but display similar characteristics (e.g. unbounded dependency) to English relative clauses, it is plausible to posit empty operator movement in Chinese relatives. But before we examine such a possibility, let us review an important analysis of Chinese relatives by Tang (1985b).

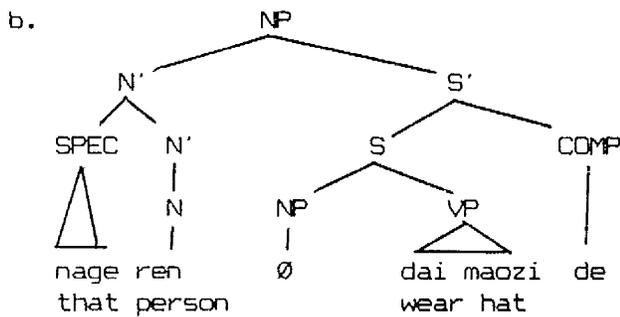
Tang (1985b:263), following Thompson (1968, 1969, 1971), suggests that Chinese relatives are derived through three stages: a) a relative clause occurs after the head noun at D-structure, b) a NP within the relative clause is deleted under identity with the head noun, and c) the relative clause shifts leftwards to precede the head noun at S-structure.

Tang's (1985b) analysis looks as follows if put in X-bar representations:

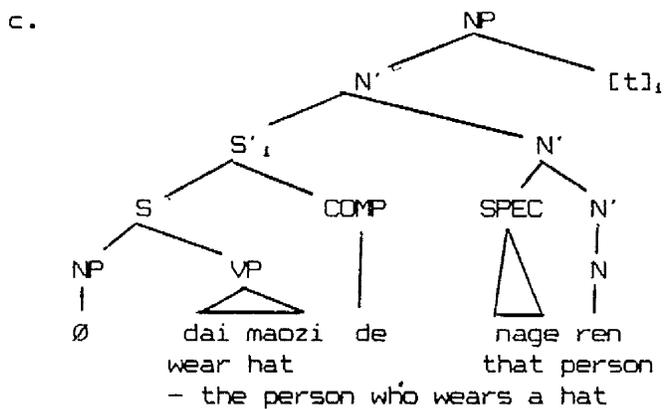
(25)a.



||  
∨



∥  
∨



According to Tang (1985b), the reason for a relative clause to occur after the head noun at D-structure follows the fact that a NP under identity deletes backwards in Chinese. So, in (25), in order that the NP in the relative clause can be deleted under identity with the head noun, it is necessary for the NP (hence the relative clause) to occur after the head noun.

However, it is problematic to adopt the NP-deletion analysis of Tang (1985b) within the GB framework we are employing. Deletion of any lexical item in GB is subject to the recoverability condition (Chomsky and Lasnik, 1977). In the case of (25), the deleted NP is not recoverable:

- (26)a. [dai maozi de] nage ren  
wear hat Comp that person  
- the person who wears a hat

b. \*[nage ren dai maozi de] nage ren

that person wear hat Comp that person

(26) suggests that NP-deletion in relative clauses is not feasible. Thus, a remedy for the analysis in (25) is necessary.

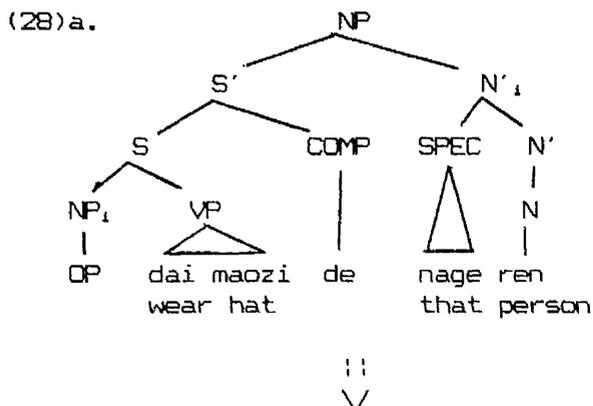
Compare (26) with a relative clause in languages like English which have relative pronouns. A relative pronoun in English will occur exactly in the position where the deleted NP is in (26), e.g.

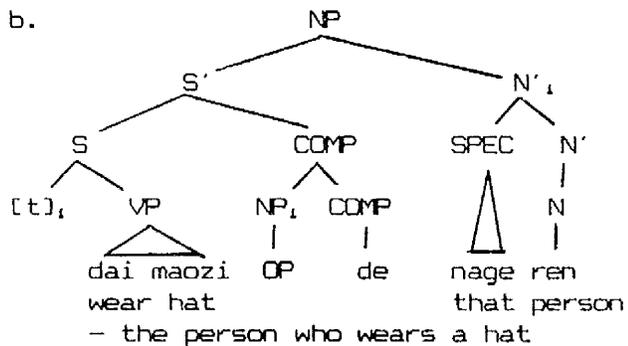
(27) the person [who wears a hat] (cf. 26b)

Alternatively, suppose that Chinese had relative pronouns. Then, where the deleted NP occurs in (26) would be a relative pronoun.

So, GB posits that languages like Chinese which do not have relative pronouns should have empty forms of such pronouns (cf. Radford, 1981, chap. 8). Besides, given the fact that relative pronouns in languages like English move into COMP from subject/object/premodifier position (cf. Chomsky, 1977), the empty forms of relative pronouns in languages like Chinese should also move into COMP (Radford, 1981:275).

Thus, the first step we take to modify Tang's (1985b) analysis in (25) is to replace the NP-deletion in the relative clause with an empty operator movement. The second step is to cancel the S'-shift, because, as there is no deletion, such a transformation becomes redundant. As a result, we have:





(28) thus conforms to the head-final ordering in NPs (cf. 2.1.2 and 2.3.1), as well as to antecedency regarding pronominalisation in Chinese. As Huang (1982b, 1988:304) observes, as long as a pronoun does not c-command its antecedent, its position relative to its antecedent (= preceding or following) is irrelevant. In (28), the empty relative pronoun (= empty operator) is such a case. It is in fact c-commanded by its antecedent (= the head noun), but is free in its governing category – the S (recall that the governing category for a pronominal in Chinese is the minimal clause in which the pronominal occurs; see 2.4.3).

Now, consider the binding between the empty operator and its trace in the relative clause in (28b). Apparently, the empty operator does not bind the trace because of the presence of 'De' in COMP. This result does not satisfy the condition set by the generalised binding framework (Aoun, 1984, 1986) which we are currently employing, that variables must be bound (see (111) of 2.4.2). In fact, Aoun (1984, 1986) did not investigate wh-movement in relative clauses.

The configuration of the relative clause in (28b) in which an empty operator moves into a filled COMP is far from being unique in Chinese relative clauses. Relative clauses in English, for example, may have exactly the same configuration when wh-movement is out of object position. Consider:

(29)a. the book<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> that [<sub>s</sub> he read t<sub>i</sub> ]]

b. the meal<sub>i</sub> [<sub>s</sub> OP<sub>i</sub> that [<sub>s</sub> you made t<sub>i</sub> for us]]

We assume that there is an empty operator movement in (29) (cf. Radford, 1981:275; Horrocks, 1987:126-128). However, (29) is not based on the classical GB analysis for English relatives. Such an analysis, as we know, proposes a deletion of a relative pronoun after it moves into COMP in cases like (29) (cf. Chomsky, 1977; Chomsky and Lasnik, 1977), as illustrated in (30) below <3>:

(30)a. \*the book<sub>i</sub> [<sub>s</sub> which<sub>i</sub> that [<sub>s</sub> he read t<sub>i</sub> ]] => wh-deletion =>

b. the book [<sub>s</sub> that [<sub>s</sub> he read ]]

Radford (1981:273-276), however, suggests that given the contrast between (29) and (30), it would be possible to combine empty operator movement with wh-deletion in analysing non-wh-relatives (= relative clauses containing no relative pronoun in surface form) in English, such as those in (29), which look like the following after wh-deletion:

(31)a. the book [<sub>s</sub> that [<sub>s</sub> he read]]

b. the meal [<sub>s</sub> that [<sub>s</sub> you made for us]]

One reason for adopting the analysis of movement and deletion of an empty operator (cf. 29 + 31), rather than movement and deletion of an overt relative pronoun (cf. 30), is that overt relative pronouns have phonetic content, and sometimes semantic content as well, so that their deletion may not be appropriate (Radford, 1981:274).

Although it is not for me in this study to determine whether languages like English which have relative pronouns may acquire empty operator movement and deletion in non-wh-relatives, the implication of the above discussion is clear for languages like Chinese which do not have relative pronouns. In my view, relative clauses in this latter type of language could all be regarded as being non-wh-relatives. If

wh-movement and deletion should apply to non-wh-relatives in languages that contain relative pronouns, it would be systematic and consistent in theory to posit that the same should apply to relative clauses in languages that do not contain relative pronouns.

Thus, as a further step to complete the analysis in (28), wh-deletion should apply to the empty operator and we then have (irrelevant details omitted): <6>

(32)a. [[ t<sub>i</sub> dai maozi] OP<sub>i</sub> de] nage ren => wh-deletion =>

wear hat            Comp that person

b. [[dai maozi] de] nage ren

wear hat    Comp that person

- the person who wears a hat

As we see in (32), there is no variable after the deletion, therefore, there is no need for any binding. Such an analysis of wh-deletion has thus solved the seemingly problematic configuration in (28b/32a) in which the empty operator cannot bind its trace as required by generalised binding (Aoun, 1984, 1986). This result will also be true in the case of (29) in English, when analysed under generalised binding. We may thus conclude that as far as non-wh-relatives are concerned, binding of variables is irrelevant due to wh-deletion.

### 5.2.3 Wh-island Conditions

Having posited abstract wh-movement in both descriptive and relative clauses (cf. 5.2.1 and 5.2.2), we have implied that both types of clause should be subject to constraints on wh-movement, such as wh-island conditions. In fact, if both types of clause comply with these conditions, it will provide further support for abstract wh-movement in

those clauses. In the following, I shall examine the reactions of both types of clause to the left branch condition (LBC) (Ross, 1967), the strong crossover phenomenon (Postal, 1971; Wasow, 1972) and the complex NP constraint (CNPC) (Ross, 1967).

1) The LBC. The observation that Chinese relative clauses (in object position) are subject to the LBC is first due to Huang (1984: 563). E.g.

(33)a. wo kanjian-le [Zhangsan didi renshi de] nage ren

I see asp ... brother know Comp that person

- I saw the person who Zhangsan's brother knew.

b. \*Zhangsan<sub>i</sub>, wo kanjian-le [ t<sub>i</sub> didi renshi de] nage ren

... I see asp brother know Comp that person

(34)a. wo kanjian-le [renshi Zhangsan didi de] nage ren

I see asp know ... brother Comp that person

- I saw the person who knew Zhangsan's brother.

b. \*Zhangsan<sub>i</sub>, wo kanjian-le [renshi t<sub>i</sub> didi de] nage ren.

... I see asp know brother Comp that person

Similarly, we find that the descriptive clauses in (35-36) below also observe the LBC:

(35)a. wo kanjian yi-ge ren [Zhangsan didi renshi]

I see one-m.p person ... brother know

- I saw a person, who Zhangsan's brother knew.

b. \*Zhangsan<sub>i</sub>, wo kanjian yi-ge ren [ t<sub>i</sub> didi renshi]

... I see one-m.p person brother know

(36)a. wo kanjian yi-ge ren [renshi Zhangsan didi]

I see one-m.p person know ... brother

- I saw a person, who knew Zhangsan's brother.

b. \*Zhangsan<sub>i</sub>, wo kanjian yi-ge ren [renshi t<sub>i</sub> didi]  
... I see one-m.p person know brother

2) Strong crossover. There is a subject-object asymmetry with Chinese relative clauses under the strong crossover phenomenon (Huang, 1984:558-559). E.g.

(37)a. wo kanjian-le [ta<sub>i</sub> shuo ta<sub>i</sub> renshi Zhangsan de] nage ren<sub>i</sub>  
I see asp 3sg say 3sg know ... Comp that person  
- \*I saw the person<sub>i</sub> who<sub>i</sub> he<sub>i</sub> said he<sub>i</sub> knew Zhangsan.

b. wo kanjian-le [ta<sub>i</sub> shuo t<sub>i</sub> renshi Zhangsan de] nage ren<sub>i</sub>  
I see asp 3sg say know ... Comp that person  
- \*I saw the person<sub>i</sub> who<sub>i</sub> he<sub>i</sub> said t<sub>i</sub> knew Zhangsan.

(38)a. wo kanjian-le [ta<sub>i</sub> shuo Zhangsan renshi ta<sub>i</sub> de] nage ren<sub>i</sub>  
I see asp 3sg say ... know 3sg Comp that person  
- \*I saw the person<sub>i</sub> who<sub>i</sub> he<sub>i</sub> said Zhangsan knew him<sub>i</sub> .

b. \*wo kanjian-le [ta<sub>i</sub> shuo Zhangsan renshi t<sub>i</sub> de] nage ren<sub>i</sub>  
I see asp 3sg say ... know Comp that person  
- \*I saw the person<sub>i</sub> who<sub>i</sub> he<sub>i</sub> said Zhangsan knew t<sub>i</sub> .

The data in (37-38) show that only when movement is out of subject position of a relative clause, does ungrammaticality result. The English translation is given for an equivalent reference (the subject-object asymmetry in Chinese does not exist in English, in which strong crossover out of both subject and object position results in ungrammaticality, as we see in the above).

Like relative clauses in (37-38), descriptive clauses show the same type of subject-object asymmetry under the strong crossover, e.g.

(39)a. wo kanjian-le yi-ge ren<sub>i</sub> [ta<sub>i</sub> shuo ta<sub>i</sub> renshi Zhangsan]  
I see asp one-m.p person 3sg say 3sg know ...  
- \*I saw a person<sub>i</sub>, who<sub>i</sub> he<sub>i</sub> said he<sub>i</sub> knew Zhangsan.

b. wo kanjian-le yi-ge ren<sub>i</sub> [ta<sub>i</sub> shuo t<sub>i</sub> renshi Zhangsan].

I see asp one-m.p person 3sg say know ...

- \*I saw a person<sub>i</sub>, who<sub>i</sub> he<sub>i</sub> said t<sub>i</sub> knew Zhangsan.

(40)a. wo kanjian-le yi-ge ren<sub>i</sub> [ta<sub>i</sub> shuo Zhangsan renshi ta<sub>i</sub> ].

I see asp one-m.p person 3sg say ... know 3sg

- \*I saw a person<sub>i</sub>, who<sub>i</sub> he<sub>i</sub> said Zhangsan knew him<sub>i</sub> .

b. \*wo kanjian-le yi-ge ren<sub>i</sub> [ta<sub>i</sub> shuo Zhangsan renshi t<sub>i</sub> ]

I see asp one-m.p person 3sg say ... know

- \*I saw a person<sub>i</sub>, who<sub>i</sub> he<sub>i</sub> said Zhangsan knew t<sub>i</sub> .

The data in (33-36) regarding the LBC and in (37-40) regarding the strong crossover phenomenon seem to provide strong evidence that both descriptive and relative clauses are subject to wh-island conditions, and indeed give further support to the analysis of empty operator movement in section 5.2. Let us move on to examine their reaction to the CNPC.

3) The CNPC. Chinese relative clauses<sup>4</sup> (in object position) also observe the CNPC (Huang, 1984:560-561), as illustrated in:

(41)a. wo renshi [yi-ge [Zhangsan xihuan de] ren]

I know one-m.p ... like Comp person

- I know a person who Zhangsan likes.

b. \*Zhangsan<sub>i</sub>, wo renshi [yi-ge [xihuan t<sub>i</sub> de] ren]

... I know one-m.p like Comp person

(42)a. wo renshi [yi-ge [xihuan Zhangsan de] ren]

I know one-m.p like ... Comp person

- I know a person who likes Zhangsan.

b. \*Zhangsan<sub>i</sub>, wo renshi [yi-ge [ t<sub>i</sub> xihuan de] ren]

... I know one-m.p like Comp person

In contrast, however, we find that descriptive clauses do not satisfy

the CNPC. Compare (41-42) with the descriptive clauses below <4>:

(43)a. wo renshi yi-ge ren [Zhangsan xihuan]

I know one-m.p person ... like

- I know a person, who Zhangsan likes.

b. Zhangsan<sub>i</sub>, wo renshi yi-ge ren [ t<sub>i</sub> xihuan]

... I know one-m.p person like

- Zhangsan, I know a person who he likes.

(44)a. wo renshi yi-ge ren [xihuan Zhangsan]

I know one-m.p person like ...

- I know a person, who likes Zhangsan.

b. Zhangsan<sub>i</sub>, wo renshi yi-ge ren [xihuan t<sub>i</sub> ]

... I know one-m.p person like

- Zhangsan, a person I know likes him.

Having observed in (33-40) that both descriptive and relative clauses comply with the LBC and with the strong crossover phenomenon, it is peculiar to see that descriptive clauses, in contrast to relative clauses, do not satisfy the CNPC. The disjunction between relative clauses and descriptive clauses in their reaction to the CNPC, as well as the disjunction in descriptive clauses themselves between their reaction to the LBC and the strong crossover phenomenon and to the CNPC, seem to suggest that the overall structure in which a relative clause occurs should differ from that in which a descriptive clause occurs. I shall discuss this point in the next section.

### 5.3 A Coordinate Structure

In 5.2.3, we observed a peculiar disjunction in descriptive clauses between their reaction to the LBC and the strong crossover and their

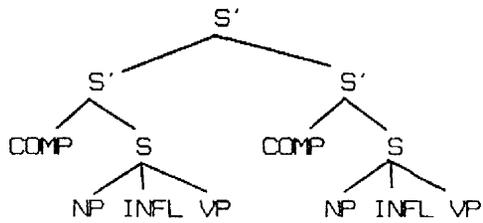
reaction to the CNPC, i.e. they obey the LBC and the strong crossover but do not satisfy the CNPC. In my view, this has to do with the overall structure of descriptive clause constructions.

Given the similar reactions of both relative and descriptive clauses to the LBC (33-36) and to the strong crossover (37-40), and given the contrasting reactions of these two types of clause to the CNPC (41-44), the only explanation for the fact that descriptive clauses do not satisfy the CNPC (43-44) is that they are not within NPs, in contrast to relative clauses which are within NPs so that they obey the CNPC. A number of other facts also argue for this account.

As we see in 5.1, there is a difference in distribution between relative and descriptive clauses. Because they are within NPs, relative clauses occur where NPs are found - in subject position of a clause and in object position of both verbs and prepositions (cf. (2) & (7)). In contrast, descriptive clauses cannot occur in subject position. They appear to occur in object position of verbs, but the fact that their occurrence in object position of a preposition gives rise to ungrammaticality (cf. (8b)) leads to the conclusion that they are not really within the object NP of a verb. This conclusion is further endorsed by two other facts: a) a pause is allowed between a descriptive clause and the preceding NP (9-11), and b) descriptive clauses, which follow the NP they modify, do not require the complementiser 'De', whose function in a relative clause is to mark the boundary between the relative clause and the following head noun.

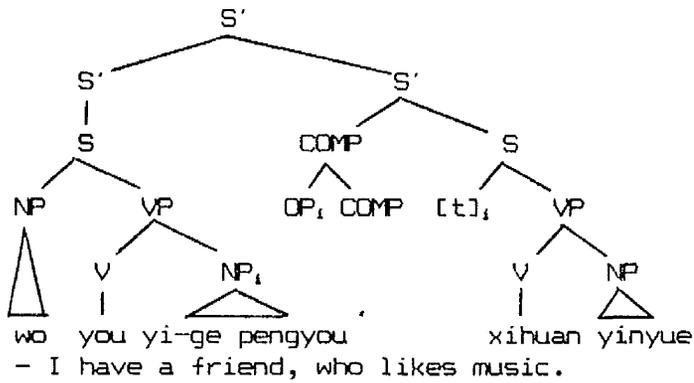
If, according to the above facts, descriptive clauses are not within NPs, what kind of structure are they in? One plausible possibility is that the descriptive clause construction as a whole is of a coordinate structure, such as in:

(45)

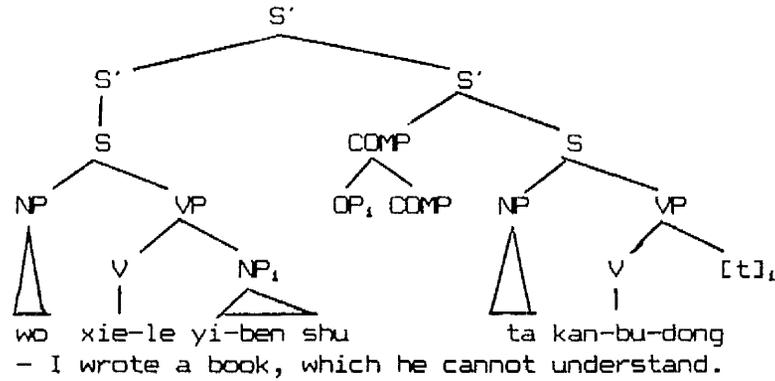


Before looking into further evidence supporting the structure in (45), let us first see how the relevant data would be analyzed under (45). The following shows descriptive clause constructions with an empty subject/object/premodifier respectively <5>:

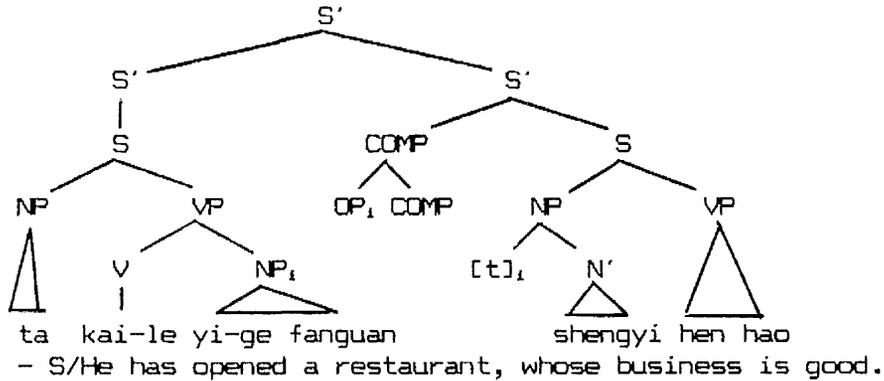
(46)a.



b.



c.



Recall the fact that a pause is allowed between a descriptive clause and the preceding NP it modifies (cf. 5.1). This fact is in agreement with one of the basic conditions of clausal coordination in Chinese. E.g.

(47)a. Ni qu, wo bu qu.

you go I not go

- You go and I won't.

b. Ni qu, wo ye qu.

you go I also go

- You go and I go too.

c. Ni qu, danshi wo bu qu.

you go but I not go

- You go, but I won't.

d. Ni qu, fouze wo ye qu.

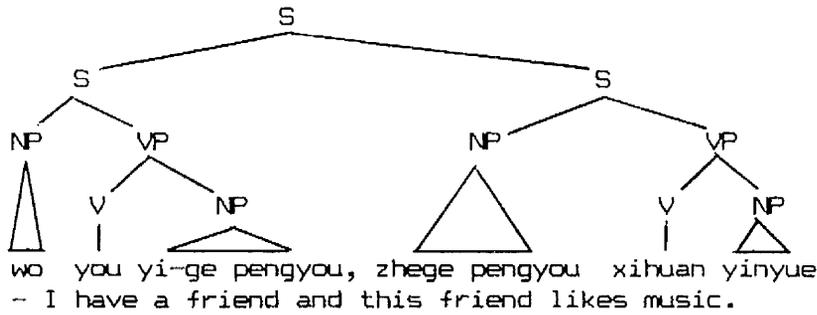
you go or I also go

- You go, or I will go too.

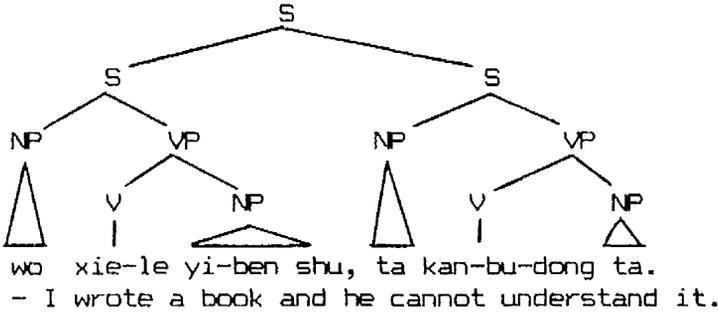
It seems that the descriptive clause construction shares a feature with these sentences in (47), namely, that a pause is allowed between two clauses in succession. Therefore, we may believe that the analysis in (46) is sound.

Besides, as the empty subject/object/premodifier in a descriptive clause can be reinstated by an overt NP (cf. 13-15), the analysis in (46) seems to offer a perfect account of this occurrence, as in:

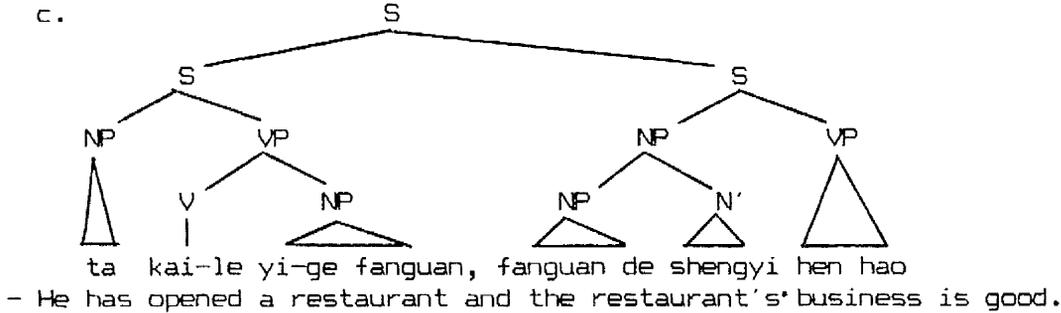
(4B)a.



b.



c.



Therefore, we may conclude that the descriptive clause construction is of a coordinated clausal structure.

#### 5.4 Summary

I have examined in this chapter the descriptive clause construction together with relative clauses in Chinese. It is observed that both descriptive and relative clauses have the same types of empty grammatical position in them, and that they both show unbounded dependency and obey wh-island conditions. Based on these observations, I have argued that there is an abstract wh-movement in both types of

clause. However, wh-deletion, which applies in relative clauses, does not operate in descriptive clauses. Pending further research, the fact that the empty grammatical positions are replaceable in descriptive clauses but not in relative clauses might be evidence in support of this.

It is also observed that, though similar to each other in the above-mentioned aspects, descriptive clauses differ from relative clauses in word order in relation to the items they modify, in whether they are able to take the complementiser 'De' and to have a pause between a descriptive/relative clause and the items they modify, in distribution and in whether they satisfy the CNPC. All these differences lead to the conclusion that relative clauses are within the NPs, but descriptive clauses are not. It is proposed upon further evidence that the descriptive clause construction is of a coordinate structure.

#### Notes:

- <1> Chu (1983:272) uses the term 'elaborative clause'.
- <2> (22c) may appear to violate the LBC. But as it represents abstract wh-movement, it does not yield any ill-formed effect.
- <3> I adopt here the view of Chomsky and Lasnik (1977) that deletion of an item/string erases the category representing that item/string, though I am aware of other assumptions, e.g. that of Kayne (1980b: 17) which opts for saving a category after deletion of its content.
- <4> (43b) and (44b) have the same surface form but two readings. In discourse situations, the context(s) help to tell one from the

other. Moreover, the ambiguity disappears when left dislocation replaces topicalisation, as in:

(i) Zhangsan<sub>i</sub>, wo renshi yi-ge ren [ta<sub>i</sub> xihuan] (cf. (43b))

... I know one-m.p person 3sg like

- Zhangsan, I know a person who he likes.

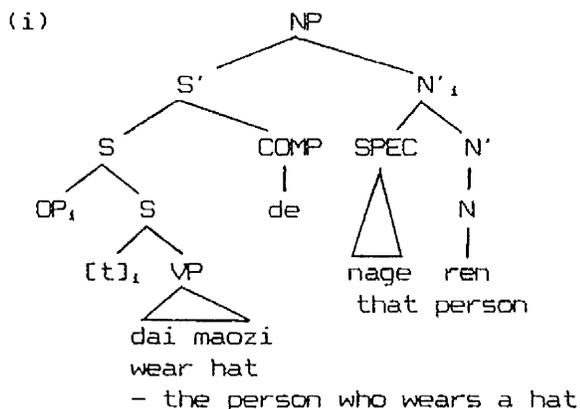
(ii) Zhangsan<sub>i</sub>, wo renshi yi-ge ren [xihuan ta<sub>i</sub>] (cf. (44b))

... I know one-m.p person like

- Zhangsan, a person I know likes him.

<5> (46c) has the same implication as stated in <2>.

<6> It should be pointed out that the wh-deletion in (32) is not problem-free. It would in fact violate the Projection Principle, as the variable occupies an A-position. An alternative analysis of OP-adjunction to S position may save this, as in:



In (i), OP binds  $t$ , hence no violation of Binding Condition A (of (111) of 2.4.2), or violation of the Projection Principle if wh-deletion applies.

## Chapter 6 Serial Verb Constructions

In this chapter, I investigate serial verb constructions.

### 6.1 Introduction

Serial verb constructions take the surface form as in:

- (1) Subject V (NP) V (NP).

For example,

- (2)a. Ta lai wan.  
      V V  
      3sg come play  
      - S/He comes to play.
- b. Ta qu zuo ke.  
      V V NP  
      3sg go be guest  
      - S/He goes (there) to be a guest.
- c. Ta cheng feiji qu Meiguo.  
      V NP NP  
      3sg ride plane go America  
      - S/He goes to America by plane.
- d. Ta mai liwu song pengyou.  
      V NP V NP  
      3sg buy gift give friend  
      - S/He buys presents for friends.

Presumably, as we see in (2), each V or V-NP in a serial verb construction forms a VP. In the literature, serial verb constructions are often referred to as V-V series, and I shall adopt this term in the following for simplicity of presentation.

The central issue about a V-V series is that it does not contain

any syntactic markers which indicate the grammatical relations between the two VPs. And the reason for adopting the term V-V series, according to Chao (1948, 1968), is to distinguish V-V series from VP-conjoining, which also takes the surface form in (1) (see 6.2).

Chao (1948:38) introduces the concept of V-V series as follows:

A very important syntactic construction which has no parallel in English is that of verbal expressions in series. We have seen already that coordination consists of juxtaposition, as Ta tiantian xie xin hui ke [he everyday write letter meet guest, YJH] 'He writes letters and receives callers everyday'. In a coordinate syntactic construction, the order is usually reversible, as Ta tiantian hui ke xie xin ['He receives callers and write letters everyday', YJH]. But under the term verbal expressions in series, we should understand verbal expressions in a fixed order.

Chao states further (Chao, 1968:325-326):

Verbal expressions in series (V-V series) form an intermediate type between coordinate and subordinate constructions, but are nearer the latter than the former. A V-V series is like a coordinate phrase in that both parts are verbal expressions, usually with an object of the first verb. However, whereas coordinate verbal expressions are reversible without affecting the value of the sentence of which they form a part, a V-V series, when reversed often has a different sentence value.

As an illustration, Chao gives examples such as (3) (Chao, 1968:326):

(3)a. (Wo) deng yi huir qu.

I wait a while go

- I wait for a while before I go.

b. (Wo) qu deng yi huir.

I go wait a while

- I will go and wait for a while.

As for the characteristics of V-V series, Chao (1968) regards the first verbal expression as a modifier of the second one. A modifier in Chao (1968:274) is a constituent which linearly precedes the head in an endocentric structure. But Chao (1948, 1968) was not concerned with the internal structure of V-V series.

Henne et al (1977:188-192) seem to follow Chao (1948, 1968) by pointing out that the important characteristic of a V-V series is that the relation between two verbal expressions is one of subordination, with one expression as the head modified by the other. They also note that a V-V series should be distinguished from:

i) A succession of clauses, which have separate predicates, while a V-V series makes up one predicate;

ii) Coordinated verb phrases, whose order is reversible without any change in meaning;

iii) verb phrases used as the object of another verb.

The scope of V-V series is considerably enlarged in Li and Thompson (1981). Their criterion is purely the surface form of a sentence. For instance, the sentences in (4-7) all take the form in (1), so according to Li and Thompson (1981), they are all V-V series and classified as follows (Li and Thompson, 1981:594-621):

i) Two-separate-events (henceforth TSE) sentences, e.g.

(4)a. Wo mai piao jin-qu.

I buy ticket enter

- I buy ticket to go in.

b. Ta shang lou shui jiao.

3sg ascend upstairs sleep

- He goes upstairs to sleep.

ii) Sentential subject/object constructions, e.g.

(5)a. Ni nian shu hen you chengjiu. (Sentential subject)

you study book very have accomplishment

- Your study has led to great accomplishments.

b. Wo panwang ni kuai yi-dian biye. (Sentential object)

I hope you soon a little graduate

- I hope that you will soon graduate.

iii) Pivotal constructions, e.g.

(6). Wo quan ta nian yi.

I persuade 3sg study medicine

- I persuade her to study medicine.

iv) Descriptive clause constructions, e.g.

(7). Wo pengdao yi-ge waiguo ren hui shuo Zhongguo hua.

I meet one-m.p foreign person can speak Chinese words

- I met a foreigner, who could speak Chinese.

As we see in (4-7), only the so-called TSE sentences belong to those which were originally defined by Chao (1948, 1968) as V-V series.

Others, e.g. Ding et al (1964), Tsao (1977), Lu et al (1979), Hu et al (1981), Zhang et al (1982), Chu (1983) and D. Zhu (1984), all seem to follow Chao (1948, 1968) in citing the core case of a V-V series as exemplified in (2). Among these authors, Chu (1983:271) and D. Zhu (1984:162), like Li and Thompson (1981), include pivotal constructions in V-V series, and Chu (1983:272) also takes descriptive clause constructions (which he calls 'elaborative clauses') as V-V series. Lu et al (1979:32) even regard subordinative clause constructions as an instance of V-V series. But as Chao (1968:326) points out, subordinative clause constructions are not of V-V series because they contain the item 'De'.

In the present study, I am inclined to follow Chao (1948, 1968) in classifying a V-V series as those exemplified in (2), and I have already discussed descriptive clause constructions in chapter 5, and shall study pivotal constructions in chapter 7 and subordinative clause

constructions in chapter 8 (also see 2.2.2.2).

## 6.2 V-V Series vs. VP-conjoining

As noted in 6.1, V-V series is to be distinguished from VP-conjoining (Chao, 1948, 1968), and according to Henne et al (1977), the former is of a subordinate structure and the latter a coordinate structure. Li and Thompson (1974b), however, suggested that V-V series could be treated as either of these. To determine this issue more accurately, let us compare V-V series with VP-conjoining in the following.

Further examples of typical V-V series are:

- (8)a. Wo shang jie mai bu.  
V NP V NP  
I ascend street buy cloth  
- I go to town to buy some cloth.
- b. Wo da dianhua qing yisheng.  
V NP V NP  
I make telephone-call invite doctor  
- I telephone to call a doctor.
- c. Ta xuyao bi xie xin.  
V NP V NP  
3sg need pen write letter  
- S/He needs a pen to write a letter.
- d. Ta jie qian mai fangzi.  
V NP V NP  
3sg borrow money buy house  
- S/He borrows money to buy a house.
- (9)a. Ta zuo feiji qu Meiguo.  
V NP V NP  
3sg sit plane go America  
- S/He goes to America by plane.

b. Wo ju shou zancheng.  
V NP V  
I lift hand approve.

- I raise my hand to show my approval.

c. Wo cheng chuan guo haixia.  
V NP V NP  
I ride ship cross strait

- I cross the strait by ship.

d. Wo zou lu shang xue.  
V NP V NP  
I walk road ascend school

- I go to school on foot.

Roughly, the sentences in (8-9) express either a purpose for which an action occurs (8), or the way or manner in which an action occurs (9). However, unless in discourse situations, there seems to be no rigorous semantic demarcation between the purpose expressions in (8) and the manner expressions in (9), as in both cases two 'bare' verbal expressions are juxtaposed without any syntactic markers signifying a definite interpretation. This might be the reason why sometimes equivocal terms are used to circumscribe all the possible entailments of a V-V series, e.g. the term 'two-separate-events' used by Li and Thompson (1981) (see 6.1). But the issue of how to determine the semantics of a V-V series does not concern me here. As far as the difference between the sentences in (8-9) and VP-conjoining is concerned, let us consider instances of VP-conjoining in:

(10)a. Wo xie zi hua hua.  
V NP V NP  
I write character draw picture

- I write characters and draw pictures.

b. Ta chang ge tiao wu.  
V NP V NP  
3sg sing song dance

- S/He sings songs and dances.

c. Ta zuo fan xi yifu.  
V NP V NP  
3sg make meal wash clothes

- S/He cooks a meal and washes clothes.

d. Ta chou yan he jiu.  
V NP V NP  
3sg smoke tobacco drink wine

- S/He smokes and drinks.

The VP-conjoining in (10) has exactly the same surface form as V-V series in (8-9). The question, as raised above, is whether the former shares the same structure as the latter.

Chao (1948, 1968) has already pointed out that VP-conjoining enjoys free word order reversal without causing any change in meaning, while V-V series undergoing word order reversal will yield a meaning change (see 6.1). Let us compare the two cases further below.

Semantically, as we see in (8-9), a V-V series may entail a purpose or manner interpretation. But a VP-conjoining entails neither of these interpretations (10); instead, it seems to be an accumulation of the meanings of each VP. Although a V-V series may sometimes have an accumulation of the meanings of each VP that it contains, e.g. 'Wo jie qian mai fangzi' (I borrow money to buy a house) may be interpreted as 'I borrow money and buy a house', a VP-conjoining, on the other hand, never has a purpose or manner interpretation, e.g. 'Wo xie zi kan shu' (I write characters and read books), cannot entail 'I write characters to read books'!

Besides, a V-V series can always answer the question of Why or How, but a VP-conjoining cannot answer either of these questions. Consider:

(11)a. V-V series expressing a purpose:

Q: Ni weishenme qu yiyuan?

you why go hospital

- Why do you go to the hospital?

A: Wo qu yiyuan kan bing.

I go hospital see illness

- I go to the hospital to see a doctor.

b. V-V series expressing a manner:

Q: Ni zenyang hui jia?

you how return home

- How do you go home?

A: Wo zuo chuzuche hui jia.

I sit taxi return home

- I go home by taxi.

c. VP-conjoining sentences:

Q1: Ni weishenme dai maozi?

you why put-on hat

- Why are you wearing your hat?

A1: !Wo dai maozi chuan maoyi.

I wear hat wear sweater

- I wear my hat and sweater.

Q2: Ni zenyang hua hua?

you how draw picture

- How do you draw pictures?

A2: !Wo xie zi hua hua.

I write character draw picture

- I write characters and draw pictures.

Phonologically, it is observed that a pause is allowed between the

VPs of a VP-conjoining, e.g.

(12)a. Wo xie zi, hua hua. (cf. (10a))

I write character draw picture

- I write characters and draw pictures.

b. Ta chou yan, he jiu. (cf. (10d))

3sg smoke tobacco drink wine

- S/He smokes and drinks.

In contrast, a V-V series does not allow a pause between its two VPs,

e.g.

(13)a. Wo qu xuexiao kai hui.

I go school have meeting

- I go to the school to attend a meeting.

b. \*Wo qu xuexiao, kai hui.

I go school have meeting

(14)a. Wo zuo gonggongqiche jin cheng.

I sit bus enter town

- I go to town by bus.

b. \*Wo zuo gonggongqiche, jin cheng.

I sit bus enter town

Syntactically, there are several aspects which seem to highlight the differences between V-V series and VP-conjoining. These aspects are topicalisation, modality, negation, aspect-marking, focusing and pseudo-cleft constructions. Let us consider them one by one.

1) Topicalisation fails to apply to either VP of a VP-conjoining:

(15)a. Ta [chang ge] [tiao wu]

VP1 VP2

3sg sing song dance

- S/He sings and dances.

b. \*[Chang ge], ta [tiao wu]

c. \*[Tiao wu], ta [chang ge]

- (16)a. Ta [zuo fan] [xi yifu]  
           VP1      VP2  
       3sg make meal wash clothes  
       - S/He cooks a meal and washes clothes.
- b. \*[Zuo fan], ta [xi yifu]
- c. \*[Xi yifu], ta [zuo fan]

However, either VP of a V-V series can be topicalised:

- (17)a. Wo [qu yiyuan] [kan bing]  
           VP1      VP2  
       I go hospital see illness  
       - I go to the hospital to see a doctor.
- b. [Qu yiyuan], wo [kan bing]  
       - Going to the hospital, I see a doctor.
- c. [Kan bing], wo [qu yiyuan]  
       see illness I go hospital  
       - To see a doctor, I go to the hospital.

- (18)a. Wo [zuo feiji] [qu Meiguo]  
           VP1      VP2  
       I sit plane go America  
       - I will fly to America.
- b. [Zuo feiji], wo [qu Meiguo]  
       - By plane, I go to America.
- c. [Qu Meiguo], wo [zuo feiji]  
       - To America, I will fly.

2) Modals can only occur before the first VP of a VP-conjoining and have an effect on the second VP, but not before the second VP, e.g.

- (19)a. Wo /yao/ xie zi hua hua.  
       I want write character draw picture  
       - I want to write characters and draw pictures.

b. \*Wo xie zi /yao/ hua hua. <1>

I write character want draw picture

(20)a. Ta /hui/ you yong da qiu.

3sg can swim play ball

- S/He can swim and play ball games.

b. \*Ta you yong /hui/ da qiu.

3sg can swim can play ball

In contrast, modals can occur before either VP of a V-V series, and the scope of effect can be confined to the VP which takes a modal:

(21)a. Wo /yao/ qu yiyuan kan bing.

I want go hospital see illness

- I want go to the hospital to see a doctor.

b. Wo qu yiyuan /yao/ kan bing.

I go hospital want see illness

- I will go to the hospital to see a doctor.

(22)a. Wo /yao/ zuo feiji qu Meiguo.

I want sit plane go America

- I want to fly to America.

b. Wo zuo feiji /yao/ qu Meiguo.

I sit plane want go America

- I want to go to America by plane.

3) Negation applies only before the first VP of a VP-conjoining and has an effect on both VPs, but cannot apply before the second VP. E.g.

(23)a. Wo /bu/ chi fan shui jiao.

I not eat meal sleep

- I do not eat or sleep.

b. \*Wo chi fan /bu/ shui jiao. <2>

I eat meal not sleep

(24)a. Ta /bu/ chang ge tiao wu.

3sg not sing song dance

- S/He does not sing or dance.

b. \*Ta chang ge /bu/ tiao wu. <3>

3sg sing song not dance

But negation applies before either VP of a V-V series, and the effect can be limited to the VP which is negated:

(25)a. Wo /bu/ qu yiyuan kan bing.

I not go hospital see illness

- I do not go to the hospital to see a doctor.

b. Wo qu yiyuan /bu/ kan bing.

I go hospital not see illness

- I go to the hospital (but) not to see a doctor.

(26)a. Wo /bu/ zuo feiji qu Meiguo.

I not sit plane go America

- I will not go to America by plane (but by other transport).

- I will not fly to America (but to other destination(s)).

b. Wo zuo feiji /bu/ qu Meiguo.

I sit plane not go America

- I will not fly to America (but to other destination(s)).

4) Aspect markers, if any, must attach to both verbs of a VP-conjoining, as in:

(27)a. Wo chi-le fan shui-le jiao.

I eat-asp meal sleep-asp

- I have eaten and had some sleep.

b. \*Wo chi-le fan shui jiao. <4>

I eat-asp meal sleep

c. \*Wo chi fan shui-le jiao.

I eat meal sleep-asp

(28)a. Ta xi-le zao huan-le yifu.

3sg wash-asp bath change-asp clothes

- S/He had a bath and changed.

b. \*Ta xi-le zao huan yifu. <5>

3sg wash-asp bath change clothes

c. \*Ta xi zao huan-le yifu.

3sg wash bath change-asp clothes

But aspect markers may attach to either verb of a V-V series, as in:

(29)a. Wo qu-guo yiyuan kan bing.

I go-asp hospital see illness

- I have been to the hospital to see a doctor.

b. Wo qu yiyuan kan-guo bing.

I go hospital see-asp illness

- I have been to the hospital to see a doctor.

(30)a. Wo zuo-guo feiji qu Meiguo.

I sit-asp plane go America

- I have been on a plane to America.

b. Wo zuo feiji qu-guo Meiguo.

I sit plane go-asp America

- I have been to America by plane.

5) In a focusing construction, the focusing item 'Shi' (to be), which gives the focus on the constituent immediately following it, can only precede the first VP of a VP-conjoining and has effect on both VPs, but 'Shi' cannot occur before the second VP. E.g.

(31)a. Wo /shi/ you yong da wangqiu.

I be swim play tennis

- I do swim and play tennis.

b. \*Wo you yong /shi/ da wangqiu.

I swim be play tennis

(32)a. Ta /shi/ chang ge tiao wu.

3sg be sing song dance

- S/He does sing and dance.

b. \*Ta chang ge /shi/ tiao wu.

3sg sing song be dance

However, 'Shi' may precede either VP of a V-V series, and the focus is given only to the VP that immediately follows 'Shi' (at least there can be such an interpretation):

(33)a. Wo /shi/ qu yiyuan kan bing.

I be go hospital see illness

- It is to the hospital that I go to see a doctor.

b. Wo qu yiyuan /shi/ kan bing.

I go hospital be see illness

- It is to see a doctor that I go to the hospital.

(34)a. Wo /shi/ zuo feiji qu Meiguo.

I be sit plane go America

- It is by plane that I go to America.

b. Wo zuo feiji /shi/ qu Meiguo.

I sit plane be go America

- It is to America that I go by plane.

To highlight the difference between VP-conjoining and V-V series in a focus construction, we may further use the focusing frame 'Shi...de'

(be ... particle), which gives focus on the object of a verb that occurs in the frame. Consider the following which show how the objects of the verbs of a VP-conjoining are focused:

(35)a. Wo /shi/ xie /de/ zi hua /de/ hua.  
          V1      NP1 V2      NP2  
          I be write p. character draw p. picture

- It is characters and pictures that I write and draw.

b. \*Wo /shi/ xie /de/ zi hua hua.

c. \*Wo xie zi /shi/ hua /de/ hua.

(36)a. Wo /shi/ zhu /de/ fan pao /de/ cha.  
          V1      NP1 V2      NP2  
          I be boil p. rice brew p. tea

- It is rice and tea that I boil and brew.

b. \*Wo /shi/ zhu /de/ fan pao cha.

c. \*Wo zhu fan /shi/ pao /de/ cha.

As we see, 'Shi...de' cannot apply to one verb only (35b-c, 36b-c), but has to apply to both verbs of a VP-conjoining. To do so, the particle 'De' has to be used twice, following both verbs (35a, 36a). This evidently indicates that a VP-conjoining is an island for focusing.

In the case of a V-V series, however, the focusing frame can apply to either verb. E.g.

(37)a. Wo /shi/ qu /de/ yiyuan kan bing.

          I be go p. hospital see illness

- It is to the hospital that I go to see a doctor.

b. Wo qu yiyuan /shi/ kan /de/ bing.

          I go hospital be see p. illness

- It is a doctor that I go to see in the hospital.

(38)a. Wo /shi/ zuo /de/ feiji qu Meiguo.

I be sit p. plane go America

- It is a plane that I board for America.

b. Wo zuo feiji /shi/ qu /de/ Meiguo.

I sit plane be go p. America

- It is America that I fly to.

In (37-38), a V-V series does not seem to be an island for focusing.

b) In a pseudo-cleft sentence, the marker 'De-Shi' (Comp be) which occurs where the cleft is, cannot occur between the verb and object of either VP of a VP-conjoining:

(39)a. Ta chou yan he jiu.

3sg smoke cigarette drink wine

- S/He smokes and drinks.

b. \*Ta chou /de shi/ yan he jiu.

Comp be

c. \*Ta chou yan he /de shi/ jiu.

Comp be

(40)a. Ta da pai xia qi.

3sg play bridge play chess

- S/He plays bridge and chess.

b. \*Ta da /de shi/ pai xia qi.

Comp be

c. \*Ta da pai xia /de shi/ qi.

Comp be

In contrast, 'De-Shi' does occur between the verb and object of either VP of a V-V series:

(41)a. Ta da dianhua jiao chuzuche.

3sg make telephone-call call taxi

- S/He telephones to call a taxi.

b. Ta da /de shi/ dianhua jiao chuzuche.  
Comp be

- It is a telephone-call that s/he made to call a taxi.

c. Ta da dianhua jiao /de shi/ chuzuche.  
Comp be

- It is a taxi that s/he telephones to call.

(42)a. Ta pai dui gua hao.

3sg line queue register number

- S/He queues to register.

b. Ta pai /de shi/ dui gua hao.  
Comp be

- Where s/he is lining up to register is a queue.

c. Ta pai dui gua /de shi/ hao.  
Comp be

- What s/he queues for is to register.

According to all the above results, we may produce the following table,  
in which "+" indicates a positive result and "-" a negative one:

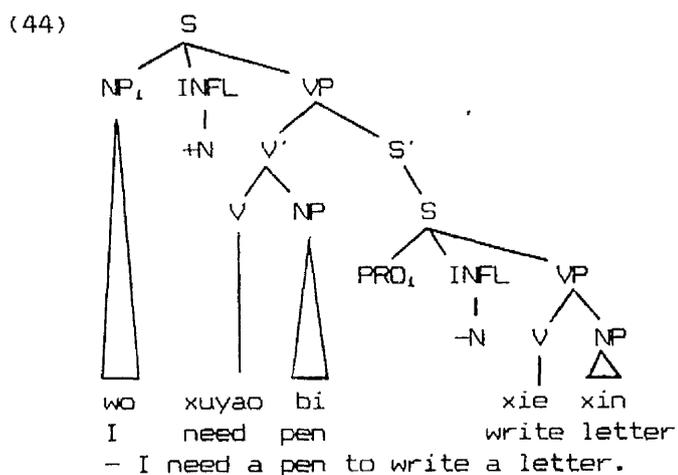
(43) Comparison between V-V Series and VP-conjoining

	V-V Series	VP-conjoining
Answering why/how questions	+	-
Pause between two VPs	+	-
Topicalising either VP	+	-
Modals occur before 2nd V	+	-
Negating 2nd V	+	-
Aspect-marking 2nd V	+	-
Focusing item occurs before 2nd V	+	-
2nd V occurs in focusing frame	+	-
Pseudo-cleft marker occurs between V and NP in either VP	+	-

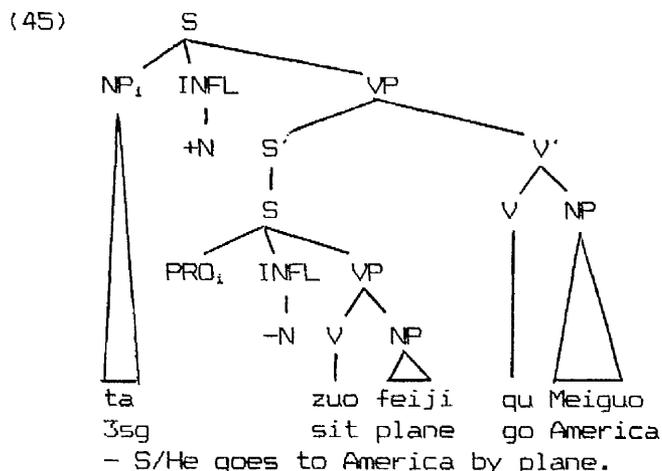
Given (43), we may thus conclude that a V-V series behaves differently from VP-conjoining. This evidently supports the notion that a V-V series is of a subordinate structure (cf. Henne et al, 1977:188-192).

## 6.2 Subject-control

If V-V series represents a subordinate structure, it can then be analysed as subject-control in GB, because as we have seen in 6.1 the subject of a V-V series semantically "controls" both verbs. Thus, we may have:



If the PRO-clause precedes the head, we then have:



The reason for operating the non-restricted order of the PRO-clause in subject-control is because the PRO-clause is in a modifier position. This is in contrast to object-control, in which the PRO-clause is in a complement position (cf. (27) of 7.2).

Another important issue concerning the structures in (44-45) is that the S' is considered, as a standard assumption (Chomsky, 1986b: 300), to be a barrier to government. The reason for this is easily perceived in these structures: the V in the higher VP appears to c-command, thus to govern, PRO-position in the S', if the S' is not taken as a barrier to government. But, in fact, PRO-position is ungoverned, thus Caseless. Consider:

(46)a. wo<sub>i</sub> xuyao bi [PRO<sub>i</sub> xie xin]

I need pen write letter

- I need a pen to write a letter.

b. \*wo xuyao bi [wo xie xin]

I need pen I write letter

(47)a. ta<sub>i</sub> [PRO<sub>i</sub> zuo feiji] qu Meiguo

3sg sit plane go America

- S/He goes to America by plane.

b. \*ta [ta zuo feiji] qu Meiguo  
 3sg 3sg sit plane go America

The ungrammaticality in (46b) and (47b) suggests that subject position of the PRO-clause is Caseless, hence ungoverned (also see 2.2.3).

Consequently, due to not having a governor, PRO in (44-45) is not subject, firstly, to binding, or secondly to the subjacency condition. As far as the subjacency condition is concerned, consider:

(48)a. wo<sub>i</sub> xiwang [[pro<sub>i</sub> neng jie yi-zhi bi [[PRO<sub>i</sub> xie xin]]]]

I hope can borrow one-m.p pen write letter  
 - I hope that I can borrow a pen to write a letter.

b. ta<sub>i</sub> shuo [[pro<sub>i</sub> [[PRO<sub>i</sub> zuo feiji]] qu Meiguo]]

3sg say sit plane go America  
 - S/He says that s/he will go to America by plane.

In (48), it is PRO, not pro, that we are concerned with. The PRO has its antecedent outside the pro-clause, thus crossing more than one bounding category, violating the subjacency condition.

Given the above, we may consider that the analyses for V-V series as subject-control is sound.

### 6.3 Empty Operator Movement

In (44), purposive constructions that take the form of V-V series are analysed as subject-control. In these constructions, the purposive clause often contains a transitive verb, such as that in (44). However, the purposive clause can also contain an intransitive verb, as in:

(49)a. Women qu haibian wan.

we go seaside play

- We go to the seaside for an outing.

b. Women gai fangzi zhu.

we build house live

- We build houses to live in.

Under the analysis in (44), (49) has the following representation:

(50) women<sub>i</sub> qu haibian [PRO<sub>i</sub> wan]

we go seaside play

- We go to the seaside for an outing.

It is observed, however, that in some cases even if the purposive clause contains a transitive verb, the object of this transitive verb has to be empty. Consider:

(51)a. Wo zuo fan chi./\*Wo zuo fan chi fan.

I cook meal eat

- I cook a meal to eat.

b. Wo zhao gongzuo zuo./\*Wo zhao gongzuo zuo gongzuo.

I look-for job do

- I am looking for a job to do.

c. Wo dao cha he./\*Wo dao cha he che.

I pour tea drink

- I pour tea to drink.

d. Wo mai shu kan./\*Wo mai shu kan shu.

I buy book read

- I buy books to read.

Given the analysis in (44), (51) may have the representation in:

(52) wo<sub>i</sub> zuo fan [PRO<sub>i</sub> chi \_\_\_ ]

I cook meal eat

- I cook a meal to eat.

where "\_\_\_" marks the empty object. The question is how we should account for this empty object.

A traditional analysis of the data in (51) is that the object of the second verb is 'omitted' under coreference with the object of the first verb (Lu et al, 1979; Hu et al, 1981; Zhang et al, 1982; Zhu, 1984). This account implies that there should be a rule that obligatorily deletes the object of the verb in the type of purposive clause in (51). Setting aside the issue of how the rule in question would work in a grammar which contains such a rule, within GB, deletion for the type of data in (51) is certainly not an option. This is because deletion of any lexical item in GB is subject to the recoverability condition (Chomsky and Lasnik, 1977). Because the empty object in (51) is obligatory, an analysis of deletion for this item is not feasible. The solution that Chomsky (1980, 1986a:112; 1986b:329) suggests for the same type of data in English is an analysis of empty operator movement, as illustrated in:

(53) I<sub>i</sub> bought a book<sub>j</sub> [<sub>s</sub> OP<sub>j</sub> [<sub>s</sub> PRO<sub>i</sub> to read t<sub>j</sub> ]]

The empty operator moves from object position into COMP of the S'. Following (53), it is plausible to give a similar analysis to Chinese sentences in (51), as in:

(54) wo<sub>i</sub> mai shu<sub>j</sub> [<sub>S</sub> OP<sub>j</sub> [<sub>S</sub> PRO<sub>i</sub> kan t<sub>j</sub> ]]

I buy book read

- I buy books to read.

The variable in (54) is bound by the empty operator, satisfying the binding condition for variables within the generalised binding framework which we employ in this study (see 2.4.2).

Given the analysis in (54), I shall subsequently discuss two independent issues: one is related to an approach to deducing the analysis in (54), and the other concerns its implications.

Consider the following:

(55)a. wo zhong cai [chi \_ he mai \_]/\*wo zhong cai [chi cai he mai cai]

I grow vegetable eat and sell

- I grow vegetables to eat and to sell.

b. wo da shui [he \_ he yong \_]/\*wo da shui [he shui he yong shui]

I fetch water drink and use

- I fetch water to drink and to use.

In (55), the purposive clause contains two coordinated verbs, both taking an obligatory empty object. How should we account for this?

An analysis of "deletion at the site" is inadequate as we have argued in the above, because the deleted items are unable to recover. But let us consider a technical issue concerning the deletion in question. Because (55) involves a coordinate structure, the deletion in question would have to apply in such a way that it covers the right item in each conjunct. For example,

(56)a. \*wo zhong cai [chi cai he mai \_] (cf. 55a)

I grow vegetable eat vegetable and sell

b. \*wo da shui [he shui he yong \_\_] (cf. 55b)

I fetch water drink water and use

(56a-b) are ill-formed because the deletion did not reach both targets as it is supposed to.

Because we do not favour an analysis of deletion, another way to look at the ungrammaticality in (56) is to consider that there is an incomplete extraction. That is, we assume that the objects in the purposive clause in (55) are extracted instead of being deleted at the site; because extraction must apply to items of equal status in all conjuncts (cf. the coordinate structure constraint (CSC) (Ross, 1967)), (56) does not satisfy this, hence the ungrammaticality.

The next question to answer, if we assume that extraction is what happens to the objects in the purposive clause in (55), is where these objects are extracted to, and what occurs next. One analysis is that they are extracted to COMP and then deleted. But, once again, because deletion of lexical items is restricted by the recoverability condition (Chomsky & Lasnik, 1977), deletion of the extracted items in COMP does not seem to be appropriate either. (57) below shows that unless deletion of the items in COMP position applies regardless of the recoverability condition, ill-formed strings result.

(57)a. wo zhong cai [( \*cai<sub>i</sub>, cai<sub>i</sub>) [chi t<sub>i</sub> he mai t<sub>i</sub> ] (cf. 55a)

I grow vegetable eat and sell

- I grow vegetables to eat and to sell.

b. wo da shui [( \*shui<sub>i</sub>, shui<sub>i</sub>) [he t<sub>i</sub> he yong t<sub>i</sub> ] (cf. 55b)

I fetch water drink and use

- I fetch water to drink and to use.

Thus, we have reached the stage at which we have seen that neither

the analysis of deletion at the site nor that of extraction plus deletion in COMP is adequate for the data in (55). A feasible solution seems to be what Chomsky (1980) suggests, viz. there are no lexical objects involved in the purpose clause in (55), but an empty operator movement instead, as illustrated in:

(58)  $wo_i$  zhong cai, [<sub>S</sub> OP, [<sub>S</sub> PRO<sub>i</sub> [<sub>VP</sub> chi t<sub>j</sub> he mai t<sub>j</sub> ]]]

I grow vegetable eat and sell

- I grow vegetables to eat and to sell.

One immediate consequence of the analysis in (58) is that when we seek an account for the ungrammaticality in (56) on the basis of (58), the former is not due to a violation of any deletion or extraction rule (e.g. the CSC), but rather due to the violation of a certain lexicon selection rule. To see how, let us repeat the relevant data below:

(59)a. \*wo zhong cai [chi cai he mai cai] (cf. 55a)

I grow vegetable eat vegetable and sell vegetable

b. \*wo zhong cai [chi cai he mai \_\_ ] (cf. 55a)

I grow vegetable eat vegetable and sell

c. \*wo zhong cai [chi \_\_ he mai cai] (cf. 55a)

I grow vegetable eat and sell vegetable

Recapitulating, if we adopt the analysis in (58), which implies that the verbs in the purpose clause do not select a<sup>n</sup> object, then the ill-formedness of the strings in (59) is due to incorrect lexicon selections.

Furthermore, if (59) results from incorrect/erroneous lexicon selections, this further implies that subcategorisation in GB can be context-sensitive. However, it is beyond my concern and the scope of this thesis to discuss this issue further <6>.

## 6.5 Summary

I have argued in this chapter in favour of the view that serial verb constructions in Chinese form a subordinate structure, and can be analysed as subject-control within the GB framework. Those V-V series which contain an intransitive verb as the second verb should be distinguished from those which contain a transitive verb as the second verb but take an empty object. For this latter case, an empty operator movement is argued.

Notes:

<1> It is acceptable when interpreted as "When I write characters, I also want to draw pictures".

<2> and <3> These sentences can be acceptable, if there is a pause after the first VP, and at the same time the second VP can obtain an overt subject, as in:

(i) Wo xie zi, (wo) bu hua hua.

I write character I not draw picture

- I write characters, (I) do not draw pictures.

(ii) Ta chang ge, (ta) bu tiao wu.

3sg sing song 3sg not dance

- S/He sings, (s/he) does not dance.

<4> It is acceptable when interpreted as "After I eat, I will go to bed".

<5> It is acceptable when interpreted as "After s/he has a bath, s/he will change clothes".

<6> See footnote <5> of chapter 3.

## Chapter 7 Pivotal Constructions

### 7.1 Introduction

In this chapter, I investigate pivotal constructions, which take the surface form in:

(1)a. Zhangsan jiao Lisi zuo-xia.  
      V1 NP V2  
      ... ask ... sit-down

- Zhangsan asks Lisi to sit down.

b. Lisi qing Zhangsan chi fan.  
      V1 NP V2 NP  
      ... invite ... eat meal

- Lisi invites Zhangsan for a meal.

The first verb in (1) is transitive and its object serves semantically as the subject of the second verb. This object is therefore called the 'pivot' (Chao, 1968:124-125).

L. Wang (1984:134) claims that the grammatical relation between the first verb and the second verb in the pivotal construction is the same as that between the finite verb and the infinitive in English sentences such as:

(2)a. Mary told John to sit down.  
      V1 NP V2  
      b. Ed persuaded Liz to repair the car.  
          V1 NP V2 NP

By coincidence, Huddleston (1984:215-217) views *John* and *Liz* in (2) to be an "intervening NP" between the two verbs, an NP which we see functions in the same way as the pivot in (1). The only difference between the pivotal sentences in (1) and their English counterparts in (2) is that (1) does not have an infinitival particle preceding the second verb.

As shown in (26a) of 1.1, the English sentences in (2) are treated as involving the object control structure in GB, in which the infinitive has an empty subject PRO controlled by the object of the finite verb, as in:

(3) Mary told John<sub>i</sub> [<sub>s</sub>[<sub>s</sub> PRO<sub>i</sub> to repair the car]]

One piece of evidence for (3) is that a sequence *\*John to repair the car* is barred, for *John* cannot receive Case from the infinitive.

In Chinese, which does not differentiate finite verbs and infinitives, deciding whether the second verb of a pivotal sentence should have a PRO subject is not so straightforward as it is in English. Firstly, the sequence Pivot-VP extracted out of a pivotal sentence is grammatical on its own:

(4)a. Lisi zuo-xia. (cf. (1a))

... sit-down

- Lisi sits down.

b. Zhangsan chi fan. (cf. (1b))

... eat meal

- Zhangsan has a meal.

Secondly, this sequence can occur in other positions as well:

(5)a. /Lisi zuo-xia/ de shijian tai chang le.

... sit-down Comp time too long p.

- The time Lisi is sitting down is too long.

b. /Zhangsan chi fan/ zhejian shi hai mei jue ding.

... eat meal this matter yet not decide

- The issue of whether Zhangsan is to eat is not yet decided.

Thus, it seems that we must first determine the constituent structure of

(1) before assigning it a control structure.

## 7.2 The Constituent Structure

As stated in 1.2, it is assumed in GB that subcategorisations of the lexicon specify the syntactic relation between each lexical entry and its complement(s). Thus, in theory, for the object control structure in (3), it is the finite verb that subcategorises for an NP and a control clause, i.e. V-NP-[PRO to VP] (= V-NP-to-VP in surface form). In practice, however, it is the job of a linguist to prove that this is the case.

Following the same reasoning, we assume that verbs in Chinese fall into categories of subcategorisation. Because there is no distinction between finite verbs and infinitives in Chinese, a verb which subcategorises for an object NP and a control clause will be V-NP-[PRO VP], whose surface form is simply V-NP-VP, compared with V-NP-to-VP in English. The difficulty in practice for Chinese is, therefore, that verbs of other categories may also share this surface form. For instance, a verb that subcategorises for a complement clause, i.e. V-[NP VP], will also have the surface form V-NP-VP.

Though we could assign a certain V-NP-VP an object-control structure if we intuitively feel that this string is of such a structure, and assign another V-NP-VP a complement clause structure by a different intuitive reflection, it is inappropriate not to seek empirical evidence for either case.

Thus, to determine the constituent structure of the pivotal construction in (1), I shall compare (1) with the complement clause construction exemplified in:

(6)a. Wo xiang huoche dao-le. (cf. (1a))

V1 NP V2  
I think train arrive-asp

- I think that the train has arrived.

b. Wo jianyi ta chang zhi ge. (cf. (1b))

V1 NP V2 NP  
I suggest 3sg sing m.p song

- I suggest that s/he sing a song.

Superficially, (6) has the same surface form as (1). The key issue as far as the constituent structure of (1) is concerned is that the complement clause in (2), the sequence NP-V2-(NP), should form a single constituent, whereas the same sequence in (1) does not. For presentation reasons, I shall call the pivot in (1) the 'pivot NP', and the subject of the complement clause in (2) the 'NP of the complement clause'.

First of all, Zhu (1984:162) observes that although pronominals in Mandarin Chinese (Putonghua) do not differentiate into nominative and accusative forms, such forms do exist in dialects, in which the pivot NP always takes an accusative form when it is a pronominal. This provides evidence that the pivot NP cannot be the subject of the following VP.

Secondly, a pause is allowed before the NP of a complement clause, but not before the pivot NP. Compare the complement clause construction in (7) and the pivotal construction in (8):

(7)a. Wo renwei, ta bu cuo.

I consider 3sg not bad

- I think that s/he is not bad.

b. Wo xiangxin, ni zuo dui le.

I believe you do correctly cl.p

- I believe that you did it correctly.

(8)a. Wo guli ta can jun./\*Wo guli, ta can jun.

I encourage 3sg join army

- I encourage her/him to join the army.

b. Wo cui ta qi chuang./\*Wo cui, ta qi chuang.

I urge 3sg get-up bed

- I urge her/him to get up.

The contrast between (7) and (8) suggests that the pivot NP phonologically belongs to the preceding verb, and thus does not seem to form a constituent with the following VP.

Thirdly, modal adverbs like 'Keneng' (probably) and 'Yexu' (perhaps) can occur before the NP of a complement clause (9-10), but not the pivot NP (11-12):

(9)a. Wo jianyi ta chang yi-zhi ge.

I suggest 3sg sing one-m.p song

- I suggest that s/he sing a song.

b. Wo jianyi /ruguo keneng/ ta chang yi-zhi ge.

I suggest if possible 3sg sing one-m.p song

- I suggest that if possible s/he sing a song.

(10)a. Wo xiang huoche dao-le.

I think train arrive-asp

- I think that the train has arrived.

b. Wo xiang /yexu/ huoche dao-le.

I think perhaps train arrive-asp

- I think that perhaps the train has arrived.

(11)a. Wo qing ta chi fan.

I invite 3sg eat meal

- I invite her/him to have a meal.

b. \*Wo qing /keneng/ ta chi fan.

I invite probably 3sg eat meal

(12)a. Ta jiao yi-ge ren qu.

3sg call one-m.p person go

- S/He asks someone to go.

b. \*Ta jiao /yexu/ yi-ge ren qu.

3sg call perhaps one-m.p person go

The fact that the intervention of modal adverbs between the pivot NP and the preceding verb is impossible suggests again that the former seems to be within the constituent of the latter rather than with the following VP.

Fourthly, the focusing item 'shi' (be), which immediately precedes the constituent to be focused, can occur before the NP of the complement clause:

(13)a. Wo xiwang ni lai.

I hope you come

- I hope that you will come.

b. Wo xiwang /shi/ ni lai.

I hope be you come

- I hope that it is you who will come.

(14)a. Wo kanjian ta zai xi yifu.

I see 3sg asp wash clothes

- I saw that s/he was washing clothes.

b. Wo kanjian /shi/ ta zai xi yifu.

I see be 3sg asp wash clothes

- I saw that it was s/he who was washing clothes.

But in contrast, 'shi' cannot occur before the pivot NP:

(15)a. Wo pai ta song xin.

I send 3sg deliver letter

- I send her/him to deliver the letter.

b. \*Wo pai /shi/ ta song xin.

I send be 3sg deliver letter

(16)a. Wo quan ta bie sheng qi.

I persuade 3sg not grow anger

- I persuade her/him not to be angry.

b. \*Wo quan /shi/ ta bie sheng qi.

I persuade be 3sg not grow anger

The contrast between (13-14) and (15-16) suggests yet again that the pivot NP does not form a constituent with the following VP, as the intervention of 'shi' between the two results in ungrammaticality.

Fifthly, the complement clause construction can form a pseudo-cleft sentence by admitting the marker 'de shi' (Comp be) between the verb of the matrix clause and the complement clause, as in:

(17)a. Wo jianyi ta xie yi-ben shu.

I suggest 3sg write one-m.p book

- I suggest that should s/he write a book.

b. Wo jianyi /de shi/ ta xie yi-ben shu.

I suggest Comp be 3sg write one-m.p book

- What I suggest is that should s/he write a book.

(18)a. Wo xiwang ta zhaodao gongzuo.

I hope 3sg find job

- I hope that s/he will find a job.

b. Wo xiwang /de shi/ ta zhaodao gongzuo.

I hope Comp be 3sg find job

- What I hope is that s/he will find a job.

In contrast, 'de shi' cannot intervene between the first verb and the pivot NP, as in:

(19)a. Wo cui ta kuai qu.

I urge 3sg quick go

- I urge her/him to go quickly.

b. \*Wo cui /de shi/ ta kuai qu.

I urge Comp be 3sg quick go

(20)a. Wo bi ta xiuxi.

I force 3sg rest

- I force her/him take a rest.

b. \*Wo bi /de shi/ ta xiuxi.

I force Comp be 3sg rest

This suggests yet again that the pivot NP is unlikely to form a constituent with the following VP.

Sixthly, a complement clause can have a parenthetical use, e.g. appearing at sentence initial position:

(21)a. Wo xiang ta kuai sheng haizi le.

I think 3sg soon give-birth child cl.p

- I think that she is going to have a baby soon.

b. Ta kuai sheng haizi le, wo xiang.

3sg soon give-birth child cl.p I think

- She is going to have a baby soon, I think.

(22)a. Wo xiwang ni zai lai.

I hope you again come

- I hope that you will come again.

b. Ni zai lai, wo xiwang.

you again come I hope

- You will come again, I hope.

But we cannot do the same to the sequence Pivot-VP, e.g.

(23)a. Wo qing ta he cha.

I invite 3sg drink tea

- I invite her/him to have tea.

b. \*Ta he cha, wo qing.

3sg drink tea I invite

(24)a. Wo jiao ni jie dianhua.

I call you receive telephone-call

- I call you to receive the telephone-call.

b. \*Ni jie dianhua, wo jiao.

you receive telephone-call I call

The fact that a complement clause can be moved as a single unit suggests that it is a constituent, whereas the sequence Pivot-VP cannot be moved as a single unit and is not a constituent.

All the above results are summarised in the following table, in which "+" indicates a positive result and "-" a negative one:

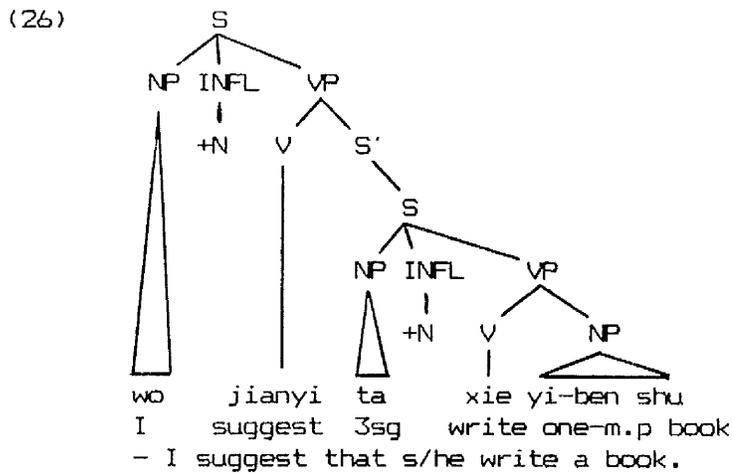
(25) Comparison between Pivotal and Complement-clause Constructions

	Pivotal Cons. (V-NP-VP)	Complement-clause Cons. (V-[NP-VP])
Pause between V and NP-VP	-	+
Modal adverbs occur before NP	-	+
Focusing item occurs before NP	-	+
Pseudo-cleft marker occurs before NP	-	+
Parenthetical use of NP-VP	-	+

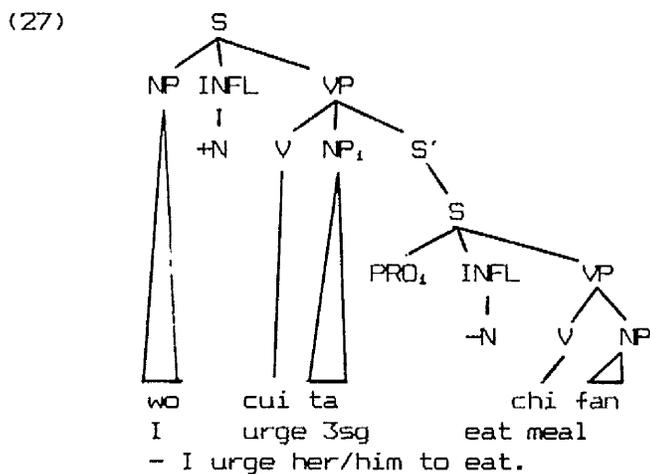
Given (25), we may thus conclude that the sequence NP-VP in the pivotal construction does not form a constituent.

### 7.3 Object-control

Assuming that the complement clause construction would represent the structure in:



we may then assign the pivotal construction the following object-control structure in contrast to (26):



(27) thus reflects the fact evidenced by the data (7-24) that the pivot NP and the following (surface) V-NP are both complements to the preceding verb, and do not form a single constituent.

Note that in both (26) and (27) the S' is taken as a barrier to government, so that the V in the higher VP does not govern the [NP/PRO, S] in the S' (cf. 6.3). In (26), we do not need multiple

government, since the [NP, S] in the S' is governed and Case-marked by INFL (cf. Chomsky, 1986b:304); in (27), PRO must not be governed (cf. 6.3). E.g.

(28)a. women xuan Lisi<sub>i</sub> [PRO<sub>i</sub> dang zhuxi]]

we elect ... be chairman

- We elect Lisi to be the chairman.

b. \*women xuan Lisi<sub>i</sub> [ta<sub>i</sub> dang zhuxi]]

we elect ... 3sg be chairman

The fact that replacing PRO in (28) with a lexical NP results in ungrammaticality suggests PRO is ungoverned, hence Caseless.

Summarising, the analysis of the pivotal construction as object-control appears to be sound as it meets evidence from both constituency and requirements within GB.

#### 7.4 Discussion

Under the ECP, another way of looking at PRO is that it is not eligible to be a governee, hence not a legitimate launching site of movement, as traces must be properly governed (Huang, 1984:556; Brody, 1985:506). Consider both English (29) and Chinese examples (30) below:

(29)a. Mary asked John<sub>i</sub> [<sub>S</sub>[PRO<sub>i</sub> to repair the car]]

b. \*Who<sub>i</sub> did Mary ask John<sub>i</sub> [<sub>S</sub> t<sub>i</sub> [ t<sub>i</sub> to repair the car]]

(30)a. Zhangsan jiao Lisi<sub>i</sub> [<sub>S</sub>[PRO<sub>i</sub> xiu che]]

... ask ... repair car

- Zhangsan told Lisi to repair the car.

b. \*Shei<sub>i</sub>, Zhangsan jiao Lisi<sub>i</sub> [<sub>S</sub> t<sub>i</sub> [ t<sub>i</sub> xiu che]]

who ... ask ... repair car

The ill-formedness in (29-30) is accounted for by the lack of Case of

the moved wh-item as well as by the fact that the trace is not properly governed (cf. Huang, 1984:556; Brody, 1985:506).

S'-deletion/transparency is barred in (29b) and (30b) because verbs with infinitival complements are invariably bridge verbs (Chomsky, 1986b:303). This is to say that if S'-deletion/transparency takes place in these cases, the matrix verb will govern PRO-position, which is not allowed. Therefore, the ECP seems to be able to play a part in explaining the ungrammaticality in (29b) and (30b).

Under the presently-employed generalised binding theory, the ECP is irrelevant. What matters is whether a variable is  $\bar{A}$ -bound (cf. 2.4.2). For (29b) and (30b), the variable is  $\bar{A}$ -bound. So this theory appears to be void for the ungrammaticality in (29b) and (30b). But, as such ungrammaticality is closely related to Case-assignment, i.e. the wh-item cannot receive Case at the launching site, it seems to suggest that the wh-item should not have been selected for this position in the first place, just as any other lexical NP is excluded from the same position (cf. (28b)). If a lexical NP, including a wh-item, occurs in this position (e.g. as a result of a processing error of grammar), the Case Filter (see 1.1) will rule it out. So, the ungrammaticality in (29b) and (30b) is explained.

## Chapter 8 Subordinative Clause Constructions

In this last chapter, I investigate subordinative clause constructions.

### 8.1 Introduction

In 2.2.2.2, when examining the alleged ECP violation in the subordinative clause construction, I concluded that raising was not an appropriate analysis for this type of construction. Naturally, the question is: what is the alternative?

One basic issue concerns the state of the empty subject in a subordinative clause. Reproducing the sentence in (29) of 2.2.2.2, we have:

- (1) ta ba wo ma-de [ \_\_\_ hen shangxin]  
BA NP V  
3sg ob.m me scold-De very sad \*

- S/He scolded me until I was very sad.

As argued in 2.2.2.2, 'De' in (1) is not in COMP of the embedded clause; because if it is, its being followed by an empty subject poses a violation of the empty subject filter. I shall return to give evidence for treating 'De' as a particle suffixed to the matrix verb after determining the empty subject in the embedded clause in (1).

Because there is no raising, the empty subject of the embedded clause is not NP-trace (cf. 2.2.2.2). Could it be a pro? Compare (1) with (2) below:

- (2) \*ta ba wo ma-de [wo hen shangxin]  
BA NP NP  
3sg ob.m me scold-De I very sad

(2) seems to show that the embedded clause cannot take a lexical

subject, suggesting that this position may not hold a *pro*, which is replaceable by a lexical NP, but rather a *PRO*, which cannot be replaced by a lexical NP (cf. 2.2.3).

But a counterexample seems to appear in:

(3) ta ma-de [wo hen shangxin] (cf. 1-2)  
      V      NP  
      3sg scold-De I very sad

- S/He scolded me until I was very sad.

Given (3), should we then say that the empty subject of the embedded clause in (1) is a *pro*?

Comparing (2) with (3), we observe that (3) is only acceptable when the BA-NP is absent. The fact that (3) has exactly the same interpretation as (1) indicates that there is a derivational relationship between these two sentences. It was previously suggested that the derivation in question is raising (Tang, 1977; Mei, 1978; Huang, 1982b, 1988; C-R Huang and Mangione, 1985). But, as we argued in 2.2.2.2, the fact that (3) is well-formed on its own argues against the raising analysis, because the subject of the embedded clause in (3) need not be raised for Case. Thus, the derivation has to be something else. To find out what it is, let us first consider what structure (3) represents. Suppose that it is as follows:

(4) [ta ma-de [wo hen shangxin]]  
      V      NP  
      3sg scold-De I very sad

- S/He scolded me until I was very sad.

The structure in (4) seems to be problematic, for we observe a difference in antecedency between (4) and an embedding structure in which the verb does not take 'De'. E.g.

(5)a. [Lisi<sub>i</sub> ma-de [ta<sub>i</sub>, hen shangxin]] (cf. 4)  
           V-De NP  
       ... scold-De 3sg very sad

- Lisi scolded him so that he was very sad.  
 (Lisi must be disjoint in reference with 'he'.)

b. [Lisi<sub>i</sub> shuo [ta<sub>i</sub>, hen shangxin]]  
           V NP  
       ... say 3sg very sad

- Lisi said that he was very sad.  
 (Lisi can be coreferential with 'he'.)

Since (5a) and (5b) share the same embedding structure, why should there be such a difference in antecedency as (5a-b) display? This evidently suggests that there is a structural difference between (5a) and (5b).

There are reasons for believing that (5b) is correctly represented (cf. 7.2). Given this, we should consider whether (5a) is misrepresented. As a matter of fact, if we change the representation of (5a) into:

(6) [Lisi<sub>i</sub> ma-de ta<sub>j</sub> [ \_\_ hen shangxin]]  
           V-De NP  
       ... scold-De 3sg           very sad

- Lisi scolded him so that he was very sad.  
 (Lisi must be disjoint in reference with 'he'.)

then, the difference between (5a) and (5b) in antecedency can be accounted for straightaway as follows:

In (5b), when the pronominal 'ta'(he) is coreferential with the subject of the matrix clause, the governing category for the pronominal has to be the embedded clause; because, if the matrix clause is taken as the governing category, the pronominal will be bound by the matrix subject, violating Binding Condition B (see (20) of 1.1). Another way of looking at this is that when the pronominal 'ta'(he) is coreferential with the subject of the matrix clause, it must not occur outside the embedded clause (= its governing category), otherwise it will be bound

by the matrix subject, hence violating Condition B. This is to say that the coreference interpretation of (5b) requires the pronominal 'ta'(he) to appear in the embedded clause.

In (5a), the pronominal 'ta'(he) simply cannot be in coreference with the matrix subject. This means that it should not occur in the embedded clause. In this way, the matrix clause is taken as its governing category, in which the pronominal is free (because of the disjoint reference).

I am aware of the fact that the pronominal 'ta'(he) in (5b) can also be disjoint in reference with the matrix subject. But the point at issue is that it is not differentiated from (5a) in structure when it has an interpretation of coreference.

The new representation in (6) solves this problem precisely. In (6), the pronominal 'ta'(he) occurs outside the embedded clause, contrasting with (5b) in which 'ta'(he) occurs in the embedded clause.

Let us return to the issue of whether the empty subject of the embedded clause in (3) is a pro. Given that (3) should be (6), consider:

(7) \*[ta ma-de wo [wo hen shangxin]]  
      V   NP   NP  
      3sg scold-De I   very sad

which shows that the embedded clause refuses a lexical subject, suggesting that this position is not for pro.

Alternatively, it is plausible to consider that the embedded clause has a PRO, subject to further analysis to come:

(8) [ta ma-de wo<sub>i</sub> [PRO<sub>i</sub> hen shangxin]]  
      V   NP  
      3sg scold-De me           very sad

- S/He scolded me until I was very sad.

Given (8), let us now consider the major issue which we are concerned with: what the derivation between (1) and (8) could be.

Re-presenting them in (9) for convenience, we see that the NP 'wo' (me) occurs before the verb when BA is present, but after the verb when BA is absent:

(9)a. ta ba wo<sub>i</sub> ma-de [PRO<sub>i</sub> hen shangxin]  
       BA NP    V  
       3sg ob.m me scold-De    very sad  
       - S/He scolded me until I was very sad.

b. ta ma-de wo<sub>i</sub> [PRO<sub>i</sub> hen shangxin]  
       V    NP  
       3sg scold-De me        very sad  
       - S/He scolded me until I was very sad.

Given that BA is present by insertion (cf. 3.2), we would expect the following derivation process for (9a):

(10) \*ta wo<sub>i</sub> ma-de [PRO<sub>i</sub> hen shangxin] => BA-insertion => (9a)  
       NP    V  
       3sg me scold-De        very sad

As for (9b), given (10), what appears to be superficially possible is as follows:

(11) \*ta wo<sub>i</sub> ma-de [PRO<sub>i</sub> hen shangxin] => V-movement => (9b)  
       NP    V  
       3sg me scold-De        very sad

Given (10-11), we may first conclude that there is actually no direct derivation between (9a) and (9b), but rather they are derived from the same D-structure.

In fact, Huang (1988:299) proposes the same results as those in (10-11). However, two issues are worth emphasizing. One, I have studied the relevant data from a different angle from that of Huang (1988). Secondly, and more importantly, I shall demonstrate in the following that V-movement in (11) is in fact not feasible, and an alternative analysis to (11) is called for.

## 8.2 Defective V

The proposed V-movement in (11) is not feasible because empirical facts show that when a verb is suffixed with 'De', it rejects its object, i.e. V-NP => \*V-De-NP. Consider:

- (12)a. da ta  
V NP  
beat 3sg  
  
- to beat her/him
- b. \*da de ta  
V De NP  
beat De 3sg

To save (13b), either a verb should occur after 'De':

- (13)a. da de kua ta  
V De V NP  
beat De collapse 3sg  
  
- to beat her/him to collapse.
- b. da de si ta  
V De V NP  
beat De die 3sg  
  
- to beat her/him to death.

Or a VP should occur after the NP:

- (14)a. da de ta [shuo bu chu hua lai]  
V De NP VP  
beat De 3sg say not out word come  
  
- (Someone) beat her/him so much that s/he could not speak.
- b. da de ta [dao zai di-shang]  
V De NP VP  
beat De 3sg fall at ground-on  
  
- (Someone) beat her/him so much that s/he fell onto the ground.

In terms of GB, the data in (12-14) suggest that in a sequence V-De-NP-VP, the NP gets Case from the following VP, but not from the preceding V-De. This means that the V-movement NP-[V-De] => [V-De]-NP suggested in (11) is not feasible.



c. qi-de si \_\_ he ma-de si ta  
annoy-De die 3sg and scold-De die 3sg  
- to annoy and scold him to death

(17)a. qi-de si ta he qi-de si ni  
annoy-De die 3sg and annoy-De die you  
- to annoy him and you to death

b. \*qi-de si ta he \_\_ si ni  
annoy-De die 3sg and die you

c. qi-de si ta he \_\_ \_\_ ni  
annoy-De die 3sg and you  
- to annoy him and you to death

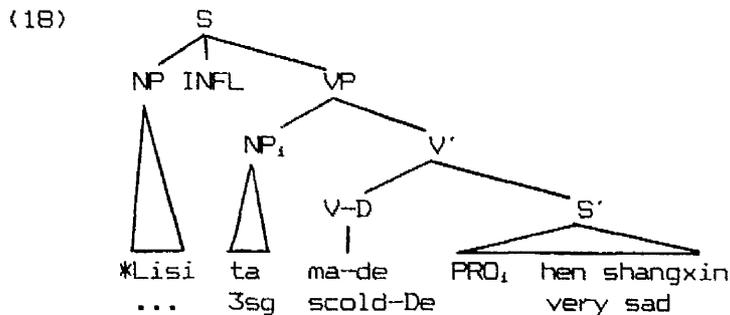
In structures like (15), V-D does not Case-mark the NP, but the V does. Such an additional V, or Case-assigning category, seems to be an essential requirement for a VP containing a defective verb, though the V-D remains as the head of the VP.

However, we presume that V-D retains its  $\theta$ -marking function under government. This is possible as  $\theta$ -marking in Chinese is to the left of a head, and seems plausible in the example in (15) showing that [NP, VP] is also the patient of the action identified by V-D. In fact, because of the presence of the additional verb, the V-D-V configuration in (15) produces, semantically, the so-called "resultative verb-complement", with the V-D describing an action and the -V the result of the action, as we have seen in (12-15) and in other examples.

To sum up, a defective verb (= V-D)  $\theta$ -marks its object, but fails to Case-mark the latter due to the presence of 'De', which presumably blocks the "path" of government of the verb to its right.

### 8.2.1 S'-deletion and INFL[-N] => INFL[+N]

We now consider the type of data in (14), which is the same as what we have seen in (9b), analysed as containing a PRO-clause and having the following D-structure (cf. Huang, 1988:297, 299):



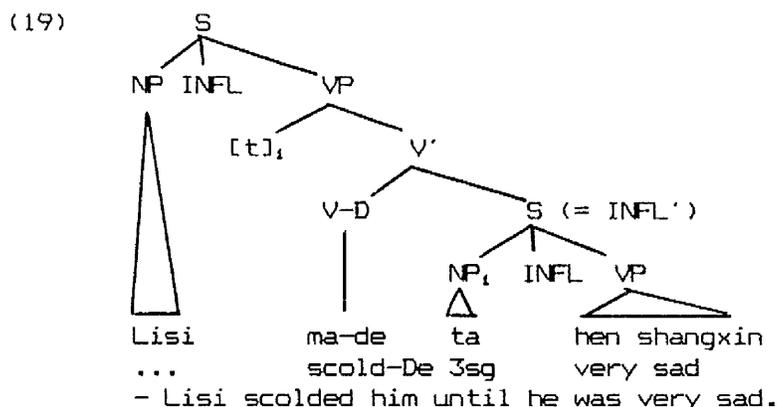
(18) differs from (15) in that V-D takes an S' instead of a V.

As mentioned earlier, Huang (1988:299) suggests that V-D in (18) moves to precede [NP, VP] in order to Case-mark the latter. In the case of a simple V, this will work. But this does not work for V-D, as demonstrated in (12-14).

An alternative is for [NP, VP] to appear as the subject of the embedded clause <1>. To do this, PRO position has to become governed and Case-marked, and maintains its disjoint reference with the matrix subject. Given that V-D cannot govern or Case-mark elements to its right, a process of "S'-to-S"/S'-deletion (Lasnik and Kupin, 1977; Chomsky, 1986b:303-304) does not have the effect of providing external government or exceptional Case-marking to PRO position, which remains ungoverned and Caseless after S'-deletion unless a further process of INFL[-N] => INFL[+N] applies within the PRO-clause.

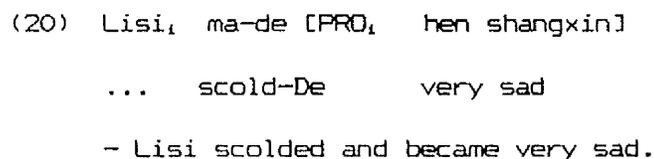
Let us assume that V-D triggers a consecutive process of S'-deletion and INFL[-N] => INFL[+N], with S'-deletion being the precondition for INFL[-N] => INFL[+N]. Besides, only V-D is associated

with INFL[-N] => INFL[+N], though there may be other types of verb that are related to S'-deletion. Applying such a process to (18), PRO is excluded and [NP, VP] may move into the subject position of the embedded clause for Case. One further issue is that the moved NP does not bind its trace, unless S becomes transparent:



Incidentally, S-transparency in (19) is allowed because V-D is incapable of governing any elements to its right, so that no undesirable effect seems to occur. Moreover, as we normally take a maximally-projected S (= INFL') as a qualified governing category, the embedded subject in (18) under S (= INFL') has to take the matrix clause as its governing category. As a result, the disjoint reference between the two NPs follows.

The residue of the analysis in (19) is that the motivation as well as the mechanism of INFL[-N] => INFL[+N] are to be better understood than I suggested above. We observe that when V-D does not take an object, the sentence which (19) represents is as follows:



Given (20), one might ask whether it is possible to treat (19) straightforwardly as an embedding structure without the external NP complement,

and as a result PRO in (20) is regarded as pro, which is identified by the matrix subject (cf. 2.2.3 & 2.4.3).

The problem with this approach toward (19) is of course that we cannot explain the BA sentence in (1), repeated in:

- (21) Lisi ba ta<sub>i</sub> ma-de [PRO<sub>i</sub> hen shangxin]  
... ob.m 3sg scold-De very sad  
- Lisi scolded him until he was very sad.

which shares the same interpretation with (19) and which we believe is derived from (18), as (19) is (cf. (10) of 8.1). The fact that 'ta' (him) can appear after BA in sentences like (21) should be sufficient evidence for 'ta' (him) being the object of the verb, rather than the subject of the embedded clause (Zhu, 1984). I shall return to this issue in 8.4.

So it seems that if the D-structure in (19) is correct (see also Huang (1988) for an independent discussion of this structure), pending future research, the process of S'-deletion plus INFL[-N] => INFL[+N] which we have assumed to have applied in (19) is potentially feasible.

### 8.2.2 V-reduplication

Another possible function of a defective verb is to trigger verb-reduplication as an alternative process to BA-insertion in (10) or INFL[-] => INFL[+N] in (19) <2>, in order to Case-mark its object.

Consider:

- (22)a. Lisi ti zuqiu ti-de hen lei.  
          V          V-De  
... kick football kick-De very tired  
- Lisi is very tired after playing football.

- b. Lisi ti zuqiu ti-de hen hao.  
       V          V-De  
 ... kick football kick-De very well
- Lisi plays football very well.

Previously, the verb taking 'De' in data like (22) has been treated as being reduplicated (e.g. Mei, 1973, 1987; Huang, 1982b, 1988). This approach is, in my view, deficient because the reduplication seems to come out of nowhere. Authors who took this approach based their argument on the following (D-structure) strings:

- (23)a. \*Lisi ti zuqiu de hen lei. (cf. 22a)  
           V          De  
 ... kick football De very tired
- b. \*Lisi ti zuqiu de hen hao. (cf. 22b)  
           V          De  
 ... kick football De very well

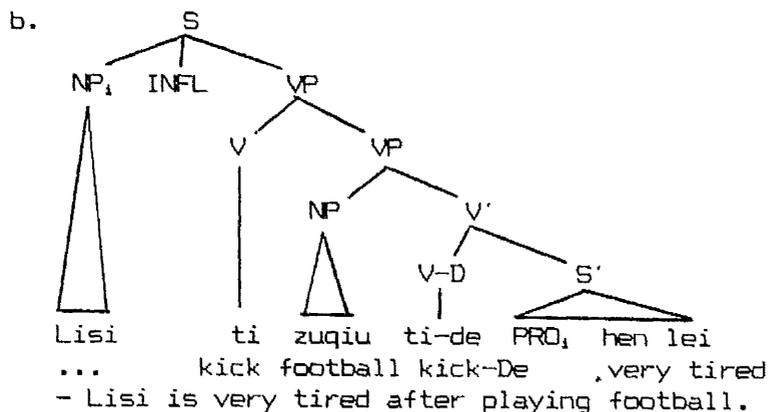
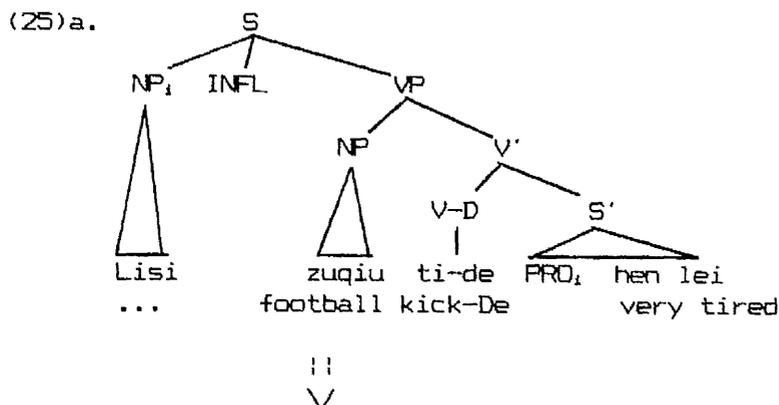
The truthfulness of these strings in (23), however, is extremely doubtful, for 'De' never occurs on its own in the language. In other words, there is no reason for such strings as (23a-b) to be processed as the output of the lexicon of Chinese. Alternatively, what seems to be plausible is as follows:

- (24)a. \*Lisi zuqiu ti-de hen lei. (cf. 22a)  
                   V-De  
 ... football kick-De very tired
- b. Lisi zuqiu ti-de hen hao. (cf. 22b)  
                   V-De  
 ... football kick-De very well
- (As for Lisi,) he plays football very well.  
 Or: As for Lisi, football is played very well.

But why is (24b) well-formed in contrast to (24a)? This will become apparent as we proceed.

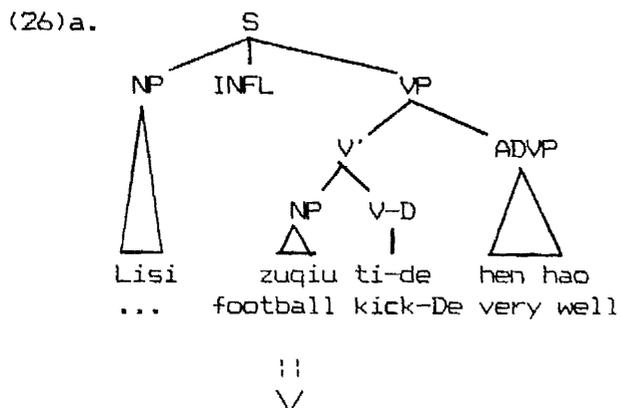
Let us look at (24a) first. Compared with (23a), (24a) is empirically reliable in that 'De' should be suffixed to a verb. Having taken 'De', the verb in (24a) becomes defective. In my view, this

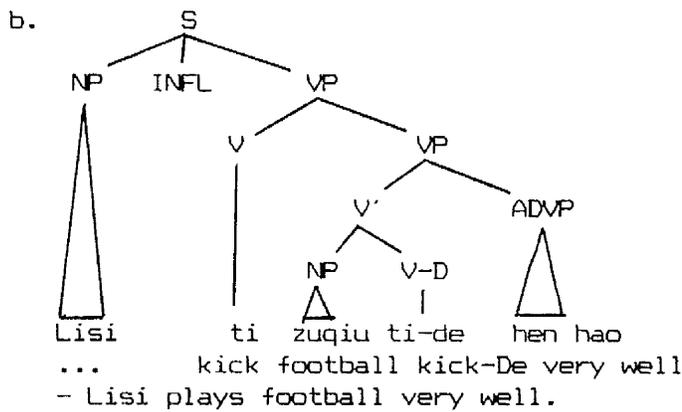
triggers verb reduplication and the presence of 'De' provides the empirical evidence. Thus, given that (24a) should contain a subordinative clause, we have:



(25b) is then exactly the sentence in (22a).

Now, to account for (24b), which we have observed to have a different pattern of interpretation, and which we believe for this reason does not contain a subordinative clause, we thus have:





(26b) is then the sentence in (22b).

Having made the above analyses, consider the following:

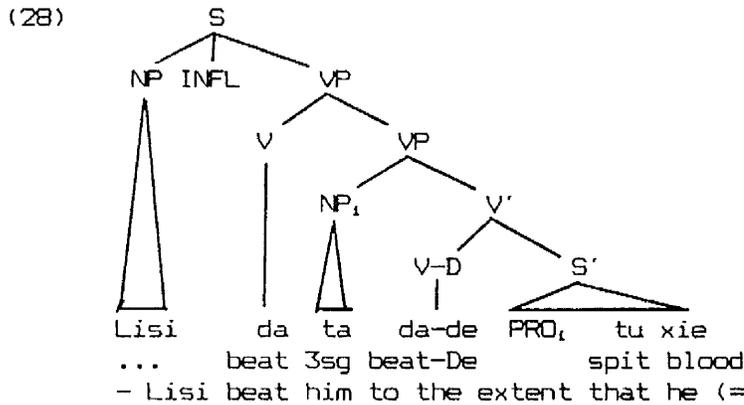
(27) Lisi<sub>i</sub> da ta<sub>j</sub> da-de [PRO<sub>i/j</sub> tu xie] (cf. 22a)  
 V V-De  
 ... beat 3sg beat-De spit blood

- a. - Lisi beat him to the extent that he (= him) spat blood.
- b. - Lisi beat him to the extent that he (= Lisi) spat blood.

(27) raises the question as to which preceding NP PRO is controlled by.

So far, our analysis in (25) can only account for the interpretation in

(27a), based on the "closest principle" (see 1.1):

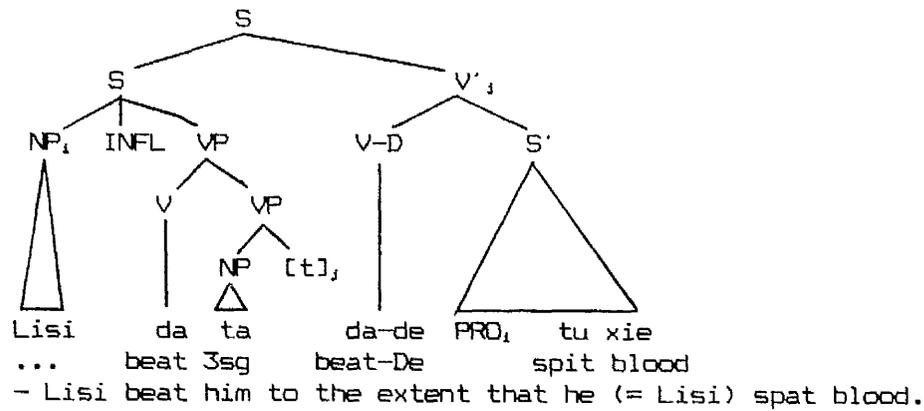


In (28), both [NP, S] and [NP, VP] c-command PRO, but [NP, VP] controls PRO by reason of being closer to the latter.

The question is how we should account for the interpretation in (27b). In order for [NP, S] to control PRO, [NP, S] has to be closer to PRO than [NP, VP] is. Thus, we propose a V'-shift to an adjoined

position to S:

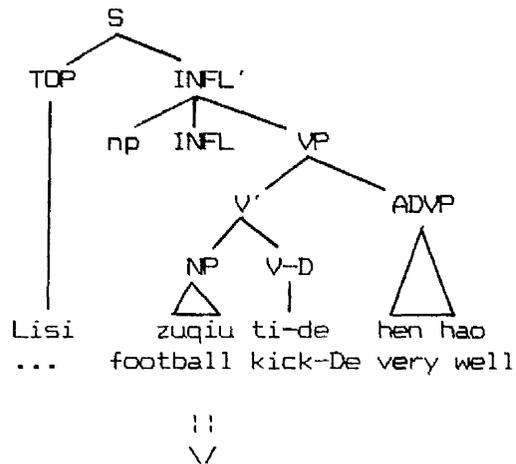
(29)

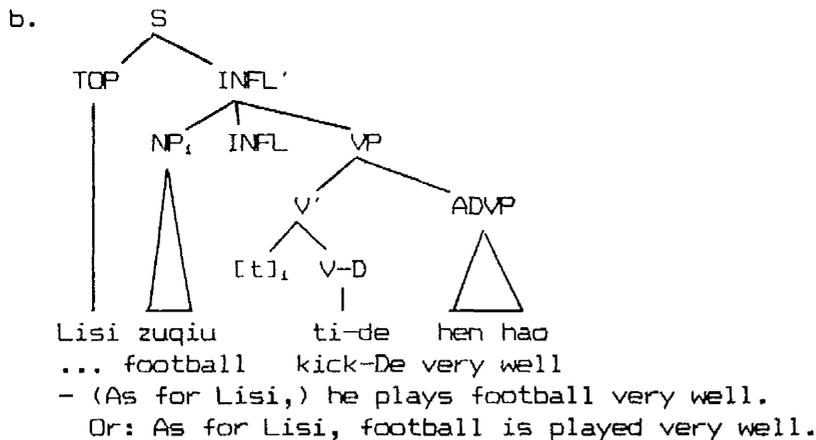


In (29), [NP, S] rather than [NP, VP], controls PRO. This is achieved by assuming that the S node to which the adjunction is made becomes transparent, so that [NP, S] may c-command PRO. (NB: the same result can be achieved through sister-adjunction without assuming that the S node becomes transparent). Compared with (28), (29) undergoes two stages of derivation, V-reduplication and V'-shift, to yield the sentence it represents.

We now return to the sentence in (24b), which appears well-formed in comparison with (24a). Precisely because of this contrast, it is possible to take (24b) as derived from a separate syntactic process. We observe that (24b) may entail a passive interpretation, which may involve the following derivations:

(30)a.





As the transformation in (30) is opaque, it cannot read off surface structures.

Now, if we compare the structures in (26a-b) which are related to (24a) with those in (30a-b) which are related to (24b), it is clear that they are two separate processes, though (26a) happens to have the same word order as (30b). Because (26a/24a) is a D-structure but (30b/24b) an S-structure, there is a contrast between the two in grammaticality.

### 8.3 The Particle De

Recall that 'De' was treated as a complementiser of the subordinative clause in the raising analysis, which we argued to be inappropriate (cf. 2.2.2.2).

In the present chapter, we have assumed all the way along that 'De' is a particle suffixed to the matrix verb. The consequences of such a treatment are obvious. If 'De' is taken as a complementiser of the subordinative clause, every element after 'De' has to be within this clause, whereas if 'De' is taken as suffixed to the matrix verb, the boundary of the subordinative clause can be re-defined, as illustrated in the following:



As for the categorial status of 'De' in general in Chinese grammar, i.e. whether it should be treated as a particle or a complementiser, a thorough investigation is beyond the scope of my discussion here. However, I shall show briefly below that when 'De' is used as a complementiser in Chinese, it has a different origin and is used in distinct contexts.

As we have seen in 2.1.2 and 5.2.2, 'De' occurs in relative clauses, in which it is treated as a complementiser. Compared with 'De' in subordinative clause constructions (henceforth De1), 'De' in relative clauses (henceforth De2) behaves differently.

L. Wang (1944, new ed. 1984:139, 195) notes that De1 originates from the verb 'de' (to get/obtain) (also see Yang et al, 1988:167-168; Huang, 1988:275), whereas the origin of De2 is the possessive marker 'zhi' in classical Chinese. In agreement with this, L. Wang (1984:139), Zhu (1984:134) and Tang (1985c:159) give dialectal evidence showing that though De1 and De2 appear in modern (Mandarin) Chinese in one phonological form, they are in distinct forms in many dialects (e.g. Cantonese, Shanghai and Taiwan dialects). In fact, even within the Mandarin speaking area (see Li and Thompson (1981:4) for the map of such an area), for example, in Chengdu in south-western China (where my parents live), 'De' in the local dialect has two distinct forms: [dɛ] for De1 and [li] for De2.

C. Ross (1984:208) observes that no additional constituents can be admitted between De1 and the preceding verb, reflecting the intuition of native speakers that De1 is attached to the preceding verb (cf. Tang, 1985:159; Huang, 1988:275). E.g

- (33)a. Fan zhu-de bu hao.  
 NP V De  
 rice boil-De not good  
 - The rice was not well cooked.
- b. \*Zhu fan de bu hao.  
 V NP De  
 boil rice De not good

But (33b) is grammatical if it means the following:

- (34) [zhu fan de] bu hao  
 boil meal Comp not good  
 - The person who cooked was not good.

As Zhu (1984:134) and Huang (1988:307) note, sentences like (34) contain a free relative, as indicated in the brackets. The contrast between (33b) and (34) in fact demonstrates the complementary distribution between V-De1 and V-De2. To see this more clearly, consider the bare sequence V-De in:

- (35) /zhu de/ hao chi  
 V De  
 boil De good eat
- a. - What is boiled is good to eat.
- b. - (Something) is boiled in such a way that it is good to eat.

The ambiguity in (35) indicates that there should be two different structures representing the distinct interpretations. To find out what the structures are, consider further:

- (36)a. Wo chi [zhu de].  
 V V De  
 I eat boil De  
 - I eat what is boiled.
- b. Wo ba [zhu de] chi-le.  
 P V De  
 I ob.m boil De eat asp  
 - I ate what was boiled.

In (36), V-De in (35) occurs in object position of a verb/preposition.

As we see, the ambiguity disappears.

The ambiguity also disappears when an NP appears before (35):

(37) Fan [zhu de] hao chi.  
NP V De  
rice boil De good eat

- The rice was so well cooked that it is good to eat.

(36) and (37) now represent respectively the two interpretations in (35). Assuming just for the purpose of presentation that [V-De] in (36) is V-De2 and [V-De] in (36) V-De1, we then know that V-De2 can occur in subject/object position (35-36), but V-De1 can occur in neither. V-de1 seems to function as the predicate of a sentence. The partial interpretation we get from (35) for V-De1, in contrast to the complete one in (37), supports this conclusion. That is, in (35), the subject for V-De1 is presumably empty, so that we have the partial interpretation. The reason for assuming (35) has an empty subject is that Chinese is a pro-drop language (cf. 2.4.3). When pro-drop occurs and the sentence happens to resemble another sentence form, as happens in (35), ambiguity arises.

Given the above, we may conclude that De1 differs from De2. As De2 is treated as a complementiser, De1 should be treated differently, e.g. as a particle attached to a preceding verb.

#### 8.4 Residues

In 8.2, I proposed that the object of the matrix verb in the subordinative clause construction might appear as subject of the subordinative clause.

But this seems to be problematic in the light of the data below (cf. Li, 1983; Aoun, 1986:15):

(38) Lisi, ku-de ta, [tou teng]  
           V      NP      NP  
       ... cry-De 3sg head ache

- Lisi cried till his (not Lisi) head ached.

In (38), there is an extra NP, 'tou'(head), which appears to be the subject of the embedded clause. If this is the case, it seems impossible to treat 'ta'(he) also as the subject of the embedded clause.

There are two ways of solving the problem. One is to treat 'ta'(he)' in (38) as a topic NP. This is allowed from the Case-marking point of view, as INFL[+N] also Case-marks TOP position (cf. 2.4.1.3). The set-back is that we have assumed that only independent clauses should contain TOP (cf. 2.4.1.3).

The other way is to treat the sequence 'tou'(head) as part of the predicate of the embedded clause, rather than as its subject. There seems to be strong evidence for this. Consider:

(39)a. Wo (de) tou teng.

I ('s) head ache

- My head aches.

b. Wo hui tou teng./\*Wo (de) hui tou teng.

I will head ache

- My head will ache.

c. Wo zuotian tou teng./\*Wo (de) zuotian tou teng.

I yesterday head ache

- My head ached yesterday.

Although 'tou'(head) in (39a) can be taken as the subject, with 'wo'(I) being the possessive NP, at the optional presence of the POSS marker 'de'('s), 'tou'(head) in (39b-c) cannot be taken as the subject, because the modal verb 'hui'(will) or the adverb 'zuotian'(yesterday) can intervene between 'wo'(I) and 'tou'(head), and because the presence of

'de'('s) results in ungrammaticality.

(39) shows that the sequence 'tou-teng' (headache) can be treated as one single unit, which functions as a subject-predicate compound verb (cf. Zhu, 1984:106). There is further evidence for this in relation to the data in (38). Consider:

(40)a. Lisi ku-de tou teng.

... cry-De head ache

- Lisi cried and gave himself a headache.

b. ?Lisi ku-de tou hen teng.

... cry-De head very ache

(41)a. Lisi ku-de ta tou teng.

... cry-De 3sg head ache

- Lisi cried till his (not Lisi) head ached.

b. ?Lisi ku-de ta tou hen teng.

... cry-De 3sg head very ache

(40-41) show that when 'tou' (head) is separated from 'teng' (ache), doubtful grammaticality arises, suggesting that 'tou' (head) is not in subject position, and that (40a) and (41a) may be analysed as follows:

(42)a. Lisi<sub>i</sub> ku-de [[PRO<sub>i</sub> tou-teng]]

... cry-De head-ache

- Lisi cried and gave himself a headache.

b. Lisi<sub>i</sub> ku-de [ta<sub>i</sub> tou-teng] (after S'-deletion)

... cry-De 3sg head-ache

- Lisi cried till his (not Lisi) head ached.

in which 'tou-teng' (headache) as a whole functions as the predicate.

Furthermore consider:

(43)a. Lisi ba tou ku-de hen teng.

... ob.m head cry-De very ache

- Lisi cried and gave himself a severe headache.

b. ?Lisi ba tou ku-de teng.

... ob.m head cry-De head ache

(44)a. Lisi ba ta ku-de tou teng.

... ob.m 3sg cry-De head ache

- Lisi cried till his (not Lisi) head ached.

b. ?Lisi ba ta ku-de tou hen teng.

... ob.m 3sg cry-De head very ache

(43a) and (44b) show that in the absence of 'tou' (head), the adverb 'hen' (very) may occur before 'teng' (ache); but 'hen' (very) may not occur in the presence of 'tou' (head), indicating that 'tou-teng' should be treated as one unit. (43b) and (44a) reinforce this point. Therefore, (43a) and (44a) may be analysed as:

(45)a. Lisi ba tou<sub>i</sub> ku-de [[PRO<sub>i</sub> hen teng]]

... ob.m head cry-De very ache

- Lisi cried and gave himself a severe headache.

b. Lisi ba ta<sub>i</sub> ku-de [PRO<sub>i</sub> tou-teng] (after S'-deletion)

... ob.m 3sg cry-De head-ache

- Lisi cried till his (not Lisi) head ached

If the above analyses in both (42) and (45) stand, they are consistent with those we have given for the subordinative clause construction in 8.2.1 and 8.2.2.

Notes:

<1> Mei (1987) proposes [NP, VP] movement into the subject position of the embedded clause under the approach of V-reduplication, which I study independently in 8.2.2.

<2> As all three operations are alternatives to one another, the implication is that these operations are also controlled for their use at a given time. The issue of whether grammar itself retains such control needs separate studies.

## Chapter 9 Conclusion

This thesis has concentrated on an analysis of Chinese syntax within the Government-Binding Theory (GB). It is hoped that the arguments presented in this thesis will prove a useful contribution to the study of Chinese syntax within GB in particular, and to the study and teaching of Chinese grammar in general.

A number of aspects of Chinese syntax have been discussed, including BA and BEI constructions, wh-quantifier constructions, descriptive clause constructions (including relative clauses), serial verb constructions, pivotal constructions and subordinative clause constructions. Topics such as X-bar syntax and head ordering in Chinese, the governing function of INFL, the COMP-marking system, distribution of PRO and pro, Case-adjacency, the notion of accessible SUBJECT, the scope of quantificational phrases (QP), and the ECP and its rival approach, "generalised binding", have also been examined.

It has been found that:

1) Chinese conforms to the X-bar theory; this implies that the language is configurational, and manifests Case-adjacency (2.1.2 & 2.3.3);

2) INFL should be classified as INFL[+N] or INFL[-N] in order to elucidate the distribution between [PRO, S] and [pro/NP, S] in Chinese, since Chinese allows pro-drop despite of the absence of AGR, and does not differentiate finite verbs from infinitives (2.2.1);

3) Chinese is probably head-final, with V-movement applying for the purpose of Case-marking [NP, VP] of an active clause, and NP-movement for a passive clause, so that the  $\theta$ -Criterion is satisfied ((2.3.1, 2.3.2.1 & 2.3.2.2);

4) The *i*-within-*i* condition does not apply in Chinese, as a SUBJECT in Chinese is simply the antecedent of an anaphor (and an accessible SUBJECT is the binder of an anaphor) (2.4.1.1);

5) Empty-topic binding rather than discursal binding may operate in Chinese (and other discourse-oriented languages), and is technically more feasible than discursal binding (2.4.1.2);

6) Move  $\alpha$  must apply to [<sub>VP</sub> ...NP...], where NP = [NP, VP/PP] and VP = a GP (3.2.2 & 4.1); however, restructuring instead of Move  $\alpha$  should apply to [NP, PP] which is at the same time a member of a higher argument structure, e.g. VP or S (3.2.1). Consequently, the analysis that [NP, VP] must occur outside the VP if the VP is a GP seems to account for the contrast between some "retained-object" constructions in which the two objects semantically exhibit a whole-part relation and those in which the two objects do not have such a relation (3.2.3);

7) The complementary distribution between wh-interrogatives and wh-quantifiers provides solid empirical evidence for the treatment of syntactic wh-quantifier movement; the COMP-marking system, [ $\pm$ WH,  $\pm$ QUAN], seems essential to license such wh-quantifier movement, whose trace may or may not be locally bound, depending on whether it is in an adjunct position; the double wh-movement constraint (DWC) appears to be more appropriate than the doubly-filled COMP filter (chapter 4);

8) Though both display unbounded dependency and obey the wh-island conditions, descriptive clauses differ from relative clauses in escaping the CNPC and in distribution, and are therefore not within the NPs which they modify (chapter 5);

9) Subject/object-control is determined by the constituency of Chinese, which does not overtly mark the boundaries between finite and nonfinite clauses (chapters 6 and 7);

10) Raising is not possible in subordinative clause constructions which contain BA. The reason for the occurrence of BA in these constructions is that the matrix verb, suffixed with 'De', becomes defective in Case-marking its object, which is then Case-marked by BA. Other alternatives to BA-insertion include verb-reduplication, NP-movement (of the object of the matrix verb into the subject position of the subordinative clause), or the attachment of an additional verb to the matrix verb. In the last case, this semantically produces the so-called "resultative verb-complement" (chapter 8).

As stated at the beginning of this thesis, the GB methodology, with its focus on a limited number of parameters rather than language-specific settings and on a system of principles rather than a system of rules (cf. Wasow, 1985), has made it possible for linguists investigating individual languages to make hypotheses in the light of these parameters and principles for the purpose of modifying or eventually proving them. This situation inevitably means that linguists investigating individual languages have to work out the mechanisms that operate in the grammars of individual languages, rather than mechanically applying a certain "standard" theory. It seems to me that the claim that the study of natural language syntax is an empirically based science should be supported by adequate testing of syntactic theories against individual languages. The current state of affairs in this respect seems unsatisfactory, partly because theories of syntax and the theoretical representations which such theories employ change rather rapidly in comparison with other physical sciences, and partly because the development of grammars of individual languages in the sense of formal syntax is still at a relatively early stage. Thus it is hoped that the research on Chinese syntax in this thesis will also contribute

towards this development.

## Bibliography

- Aoun, J. (1981) The Formal Nature of Anaphoric Relations, MIT Ph.D dissertation
- \_\_\_\_\_, (1984) A Significant Generalization in Chinese, in W. de Geest & Y. Putseys (eds.) Sentential Complementation, 11-22, Foris, Dordrecht
- \_\_\_\_\_, (1985) A Grammar of Anaphora, MIT Press, Cambridge, Massachusetts
- \_\_\_\_\_, (1986) Generalized Binding: The Syntax and Logical Form of Wh-interrogatives, Foris, Dordrecht
- \_\_\_\_\_ & Sportiche, D. (1983) On the Formal Theory of Government, Ling. Review, 2(3)
- \_\_\_\_\_ & Li, A. Y-H (1989) Scope and Constituency, Ling. Inquiry, 20, 141-172
- Andrews, A. (1983) A Note on the Constituent Structure of Modifiers, Ling. Inquiry, 14, 695-697
- Bei Da (1982) \*Function Words in Modern Chinese, Commercial Press, Beijing
- Belletti, A. & Rizzi, L. (1981) The Syntax of 'ne': Some Theoretical Implications, Ling. Review, 1(2)
- Bennett, P. A. (1978) Word Order in Chinese, University of London (SOAS) Ph.D thesis
- Borer, H. (1984a) Parametric Syntax: Case Studies in Semitic and Romance Languages, Foris, Dordrecht
- \_\_\_\_\_, (1984b) Restrictive Relatives in Modern Hebrew, Natural Language and Linguistic Theory, 2(2)
- Bouchard, D. (1984) On the Content of Empty Categories, Foris, Dordrecht
- Bresnan, J. (1972) Theory of Complementation in English Syntax, MIT Ph.D dissertation
- Brody, M. (1985) On Complementary Distribution of Empty Categories, Ling. Inquiry, 16, 505-546
- Burzio, L. (1981) Intransitive Verbs and Italian Auxiliaries, MIT Ph.D dissertation
- \_\_\_\_\_, (1986) Italian Syntax: A Government-Binding Approach, Reidel, Dordrecht
- Chang, R. C-J (1977) Coverbs in Spoken Chinese, Cheng Chung Book Co., Taipei

- Chao, Yuen Ren (1948) Mandarin Primer, Harvard University Press, Cambridge, Massachusetts
- \_\_\_\_\_, (1968), A Grammar of Spoken Chinese, University of California Press, Berkeley and Los Angeles
- Chen, Chung-yu (1978) The Two Aspect Markers Hidden in Certain Locatives, in R. L. Cheng, Y-c Li & T-c Tang (eds.) Proceedings of Symposium on Chinese Linguistics, 1977 Linguistic Institute of the Linguistic Society of America, 233-242, Student Book Co., Taipei
- Cheung, S. H-n (1973) A Comparative Study in Chinese Grammars: the BA-construction, Journal of Chinese Ling., 1, 343-382
- Chomsky, N. (1965) Aspects of the Theory of Syntax, MIT Press, Cambridge, Massachusetts
- \_\_\_\_\_, (1970) Remarks on Nominalization, in R. A. Jacobs & P. S. Rosenbaum (eds.) Readings in English Transformational Grammar, 184-221, Ginn and Co., Waltham, Massachusetts
- \_\_\_\_\_, (1972) Studies on Semantics in Generative Grammar, Mouton
- \_\_\_\_\_, (1973) Conditions on Transformations, in S. R. Anderson & P. Kiparsky (eds.) A Festschrift for Morris Halle, 232-286, Holt, Rinehart and Winston, New York
- \_\_\_\_\_, (1977) On Wh-Movement, in P. Culicover, T. Wasow & A. Akmajian (eds.) Formal Syntax, 71-132, Academic Press, New York
- \_\_\_\_\_, (1980) On Binding, Ling. Inquiry, 11, 1-46
- \_\_\_\_\_, (1982) Some Concepts and Consequences of the Theory of Government and Binding, MIT Press, Cambridge, Massachusetts
- \_\_\_\_\_, (1981) 4th ed. (1986a) Lectures on Government and Binding, Foris Dordrecht
- \_\_\_\_\_, (1986b) Knowledge of Language, Praeger, New York
- \_\_\_\_\_ & Lasnik, H. (1977) Filters and Control, Ling. Inquiry, 8, 425-504
- Chu, Chauncey Cheng-hsi (1976) Conceptual Wholeness and the Related Object, Journal of Chinese Ling., 4, 14-23
- \_\_\_\_\_, (1983) A Reference Grammar of Mandarin Chinese for English Speakers, Peter Wang, New York
- Chung, S. (1978) Case Marking and Grammatical Relations in Polynesian, University of Texas Press
- Cinque, G. (1983) Constructions with Left Peripheral Phrases, "Connectedness", Move  $\alpha$  and ECP, University of Venice ms.

- Ding Shu-sheng et al (1961) \*Remarks on Modern Chinese Grammar, Journal of Chinese Language Press, Beijing
- Emonds, J. E. (1970) Root and Structure-preserving Transformations, MIT Ph.D dissertation
- \_\_\_\_\_, (1976) A Transformational Approach to English Syntax: Root, Structure-preserving and Local Transformations, Academic Press, New York
- \_\_\_\_\_, (1985) A Unified Theory of Syntactic Categories, Foris, Dordrecht
- Fillmore, C. J. (1968) The Case for Case, in E. Bach & T. Harms (eds.) Universals in Linguistic Theory, 1-90, Holt, Rinehart and Winston, New York
- Finer, D. (1984) The Formal Grammar of Switch Reference, University of Massachusetts Ph.D dissertation
- Freidin, R. (1978) Cyclicity and the Theory of Grammar, Ling. Inquiry, 9, 519-549
- Gazdar, G. (1982) Phrase Structure Grammar, in P. Jacobson & G. K. Pullum (eds.) The Nature of Syntactic Representation, 131-186, Reidel, Dordrecht
- George, L. & Kornfilt, J. (1981) Finiteness and Boundedness in Turkish, in F. Henry (ed.) Binding and Filtering, 105-127, MIT Press, Cambridge, Massachusetts
- Grimshaw, J. (1979) Complement Selection and the Lexicon, Ling. Inquiry, 10, 279-326
- \_\_\_\_\_, (1981) Form, Function and the Language Acquisition Device, in C. L. Baker & J. McCarthy (eds.) The Logical Problem of Language Acquisition, MIT Press, Cambridge, Massachusetts
- Gruber, J. (1965) Studies in Lexical Relations, MIT Ph.D dissertation
- He, Y. (1987), The Structure of Coverb Constructions and the Categorical Status of Coverbs in Mandarin Chinese, University of York M.Phil. thesis
- Henne, H., Rongen, D. B. & Hansen, L. J. (1977) A Handbook on Chinese Structure, Universitetsforlaget, Oslo
- Hermon, G. (1985) Syntactic Modularity, Foris, Dordrecht
- Higginbotham, J. (1983) Remarks on Nominals and Small Clauses, University of Massachusetts ms.
- Hong, S. (1985) A- and  $\bar{A}$ -binding in Korean and English, University of Connecticut Ph.D dissertation

- Hornstein, N. & Lightfoot, D. (1981) *Explanation in Linguistics*, Longman, London
- Horrocks, G. (1987) *Generative Grammar*, Longman, London
- Hu, Yu-shu et al (1981) *\*Modern Chinese (3rd ed.)*, Shanghai Education Press, Shanghai
- Huddleston, R. (1988) *English Grammar: An Outline*, CUP, Cambridge
- Huang, C-R & Mangione, L. (1985) A Reanalysis of *De*: Adjuncts and Subordinate Clauses, *Proceedings of the 4th West Coast Conference on Formal Linguistics*, 80-91, Stanford Linguistics Association, Stanford
- Huang, C-T, James (1982a) Move Wh in a Language without Wh-movement, *The Ling. Review*, 1, 369-416
- \_\_\_\_\_, (1982b) *Logical Relations in Chinese and the Theory of Grammar*, MIT Ph.D dissertation
- \_\_\_\_\_, (1984) On the Distribution and Reference of Empty Pronouns, *Ling. Inquiry*, 15, 531-573
- \_\_\_\_\_, *Wo Pao De Kuai and Chinese Phrase Structure*, *Lang.* 64, 274-311
- Huang, H-F (1978) Historical Change of Prepositions and Emergence of SOV Order, *Journal of Chinese Ling.* 6, 212-242
- Jackendoff, R. S. (1972) *Semantic Interpretation in Generative Grammar*, MIT Press, Cambridge, Massachusetts
- \_\_\_\_\_, *X' Syntax: A Study of Phrase Structure*, MIT Press, Cambridge, Massachusetts
- Jacobsen, W. (1967) Switch-reference in Hokan-Coahuiltecan, in D. Hunes & W. Bittle (eds.) *Studies in Southwestern Ethnolinguistics*, The Hague, Mouton
- Jaeggli, O. (1982) *Topics in Romance Languages*, Foris, Dordrecht
- Kato, T. (1989) *On Non-configurational Languages*, University of Durham M.A. dissertation
- Kayne, R. S. (1980a) Extensions of Binding and Case-marking, *Ling. Inquiry*, 11, 75-96
- \_\_\_\_\_, (1980b) *ECP Extensions*, University of Paris VIII ms.
- \_\_\_\_\_, (1984) *Connectedness and Binary Branching*, Foris, Dordrecht
- Koster, J. (1981) *Locality Principles in Syntax*, Foris, Dordrecht
- \_\_\_\_\_, (1984) On Binding and Control, *Ling. Inquiry*, 15, 417-459

- \_\_\_\_\_, (1987) *Domains and Dynasties: The Radical Autonomy of Syntax*, Foris, Dordrecht
- Langacker, R. (1969) *Pronominalization and the Chain of Command*, in D. Reibel & S. Schane (eds.) *Modern Studies in English*, 160-186, Prentice-Hall, Englewood Cliffs
- Lasnik, H. & Uriagereka, J. (1988) *A Course in GB Syntax: Lectures on Binding and Empty Categories*, MIT Press, Cambridge, Massachusetts
- Li, A. Y-H (1983) *Word Order and Case Assignment in Chinese*, University of Southern California ms.
- \_\_\_\_\_, (1985) *Abstract Case in Chinese*, University of Southern California Ph.D dissertation
- Li, C. N. (1975) *Synchrony vs. Diachrony in Language Structure*, *Lang.* 51, 873-886
- \_\_\_\_\_, & Thompson, S. A. (1974a) *Co-verbs in Mandarin Chinese: Verbs or Prepositions*, *Journal of Chinese Ling.* 2, 257-278
- \_\_\_\_\_, (1974b) *Serial Verb Constructions in Mandarin Chinese*, in *You Take the High Node and I'll Take the Low Node*, Chicago Linguistic Society, 10
- \_\_\_\_\_, (1976) *Subject and Topic: A New Typology of Language*, in C. Li (ed.) *Subject and Topic*, 457-489, Academic Press, New York
- \_\_\_\_\_, (1981) *Mandarin Chinese: A Functional Reference Grammar*, University of California Press, Berkeley
- Li, Jin-xi (1924) *\*A New Chinese Grammar*, Commercial Press, Beijing; new ed. (1969), Taiwan Commercial Press, Taipei
- Li, Ying-che (1971) *An Investigation of Case in Chinese Grammar*, University of Michigan Ph.D dissertation
- Liang, James Chao-ping (1971) *Prepositions, Coverbs or Verbs? A Commentary on Chinese Grammar - Past and Present*, University of Pennsylvania Ph.D dissertation
- Lii, Yu-hwui, (1975) *Word Order, Transformation, and Communicative Function in Mandarin Chinese*, Cornell University Ph.D dissertation
- Lu, Shu-xiang (1944) *\*Essentials of Chinese Grammar*, Commercial Press, Beijing
- \_\_\_\_\_, (1952) *\*Study on Grammar*, Chinese Youth Press, Beijing
- \_\_\_\_\_, et al (1979) *\*Eight Hundred Words in Modern Chinese*, Commercial Press, Beijing

- Manzini, M. R. (1983) On Control and Control Theory, *Ling. Inquiry*, 14, 421-446
- Mei, Kuang (1973) Studies in the Transformational Grammar of Modern Standard Chinese, Harvard University Ph.D dissertation
- \_\_\_\_\_, (1978) \*On Verb Phrase Complements in Mandarin Chinese, Papers in Honour of Professor Chu Wan-li on his 70th birthday, 511-536, Liangjing Publishers, Taipei
- \_\_\_\_\_, (1987) \*On Verb Reduplication, Proceedings of the 2nd International Conference on Sinology, Academia Sinica, Taipei
- Muysken, P. & van Riemsdijk, H. (1986) Projection Features and Featuring Projections, in P. Muysken & H. van Riemsdijk (eds.) *Features and Projections*, 1-30, Foris, Dordrecht
- O'Neil, W. (1981) \*English Transformational Grammar, Beijing Teachers' University Press (A publication based on a set of lectures given at the university)
- Orisourw, R. R. van (1983) Coordinate Deletion and N-ary Branching Nodes, *Journal of Ling.* 19, 305-321
- \_\_\_\_\_, (1985) A Linear Approach to Coordination Deletion, *Ling.* 23, 363-390
- Perlmutter, D. M. (1971) *Deep and Surface Structure Constraints in Syntax*, Holt, Rinehart & Winston, New York
- Pesetsky, D. (1983) *Paths and Categories*, MIT Ph.D dissertation
- Picallo, C. (1984) The INFL Node and the Null Subject Parameter, *Ling. Inquiry*, 15, 75-102
- Postal, P. M. (1971) *Cross-over Phenomena*, Holt, Rinehart and Winston, New York
- Radford, A. (1981) *Transformational Syntax: A Student Guide to Chomsky's Extended Standard Theory*, CUP, Cambridge
- Reinhart, T. (1979) Syntactic Domains for Semantic Rules, in F. Guenther & S. J. Schmidt (eds.) *Formal Semantics and Pragmatics for Natural Languages*, Reidel, Dordrecht
- Rizzi, L. (1978) Violations of the Wh-island Constraint in Italian and the Subjacency Condition, in C. Dubuisson, D. Lightfoot & Y. C. Morin (eds.) *Montreal Working Papers in Linguistics*, 11
- \_\_\_\_\_, (1982) *Issues in Italian Syntax*, Foris, Dordrecht
- Rosenbaum, P. S. (1967) *The Grammar of English Predicate Complement Constructions*, MIT Press, Cambridge, Massachusetts

- Ross, C. N. G. (1984) Adverbial Modification in Mandarin, *Journal of Chinese Ling.* 12, 207-234
- Ross, J. R. (1967) Constraints on Variables in Syntax, MIT Ph.D dissertation
- \_\_\_\_\_, (1970) Gapping and the Order of Constituents, in M. Bierwisch & K. F. Heidolph (eds.) *Progress in Linguistics*, 249-259, The Hague, New York
- Rouveret, A. (1980) Sur la Notion de Proposition Finie, *Recherches Linguistiques*, 9
- \_\_\_\_\_, & Vergnaud J.-R. (1980) Specifying Reference to the Subject: French Causatives and Conditions on Representations, *Ling. Inquiry* 11, 97-202
- Sag, I. A. & Pollard, C. J. (1987) Head-driven Phrase Structure Grammar: An Informational Synopsis, Center for the Study of Language and Information, Stanford University, Stanford
- Saito, M. (1985) Some Asymmetries in Japanese and their Theoretical Implications, MIT Ph.D dissertation
- Sells, P. (1985) Lectures on Contemporary Syntactic Theories: An Introduction to Government-Binding Theory, Generalized Phrase Structure Grammar and Lexical-Functional Grammar, Center for the Study of Language and Information, Stanford University, Stanford
- Simon, H. F. (1957), Some Remarks on the Structure of the Verb Complex in Standard Chinese, *Bulletin of the School of Oriental and African Studies*, 21, 553-79
- Sportiche, D. (1981) On Bounding Nodes in French, *Ling. Review*, 1, 219-246
- \_\_\_\_\_, (1983) Structural Invariance and Symmetry, MIT Ph.D dissertation
- Stowell, T. (1981) Origins of Phrase Structure, MIT Ph.D dissertation
- Tai, James H-Y (1969) Coordination Reduction, Indiana University Ph.D dissertation
- \_\_\_\_\_, (1973) Chinese as a SOV Language, *Chicago Linguistic Society*, 9, 659-671
- Tang, Ting-chi (1972) A Case Grammar of Spoken Chinese, Hai-Guo Book Co., Taipei
- \_\_\_\_\_, (1977) \*Studies in Chinese Transformational Grammar, Student Book Co., Taipei
- \_\_\_\_\_, (1985a) \*De Constructions in Chinese, in T-C Tang Essays on Chinese Grammar, 143-160, Student Book Co., Taipei

- \_\_\_\_\_, (1985b) \*Chinese Relative Clauses, in T-C Tang Essays on Chinese Grammar, 249-300, Student Book Co., Taipei
- \_\_\_\_\_, (1985c) \*Chinese Ditransitives, in T-C Tang Essays on Chinese Grammar, 197-226, Student Book Co., Taipei
- Taraldsen, T. (1978) On the NIC, Vacuous Application, and the That-trace Filter, Indiana University Linguistics Club, Bloomington
- Teng, Shou-hsin, (1973) Negation and Aspects in Chinese, Journal of Chinese Ling. 1, 14-37
- \_\_\_\_\_, (1974) Double Nominatives in Chinese, Linguistic Society of America Summer Meeting, Amherst
- \_\_\_\_\_, (1975) A Semantic Study of Transitivity Relations in Chinese, Student Book Co., Taipei
- Thompson, S. A. (1968) Relative Clauses and Conjunctions, Working Papers in Linguistics, 1, Ohio State University Research Foundation
- \_\_\_\_\_, (1969) On Relative Clause Structure in Relation to the Nature of Sentence Complexity, Ohio State University Ph.D dissertation
- \_\_\_\_\_, (1971) The Deep Structure of Relative Clauses, in C. J. Fillmore & D. T. Langendoen (eds.) Studies in Linguistic Semantics, 79-96, Holt, Rinehart and Winston, New York
- \_\_\_\_\_, (1973) Transitivity and Some Problems with the ba construction in Mandarin Chinese, Journal of Chinese Ling. 1, 208-221
- Toman, J. (1982) Aspects of Multiple Wh-movement in Polish and Czech, in R. May & J. Koster (eds.) Levels of Syntactic Representation, 293-302, Foris, Dordrecht
- Travis, L. (1984) Parameters and Effects of Word Order Variation, MIT Ph.D dissertation
- Tsao, F-F (1977) A Functional Study of Topic in Chinese: The First Step toward Discourse Analysis, University of California Ph.D dissertation (UCLA)
- \_\_\_\_\_, (1978) Subject and Topic in Chinese, in R. L. Cheng, Y-C Li & T-C Tang (eds.) Proceedings of Symposium on Chinese Linguistics, 1977 Linguistic Institute of the Linguistic Society of America, 165-196, Student Book Co., Taipei
- van Haaften, T., Smith, R. & Vat, J. (1983) Left Dislocation, Connectedness, and Reconstruction, in K. Ehlich & H. C. van Riemsdijk (eds.) Connectedness in Sentence, Discourse and Text, Tilburg Studies in Language and Literature, 4, Tilburg University
- van Riemsdijk, H. (1978) A Case Study in Syntactic Markedness, Foris, Dordrecht

- \_\_\_\_\_, (1981) The Case of German Adjectives, in J. Pustejovsky & V. Burke (eds.) *Markedness and Learnability*, University of Massachusetts Occasional Papers in Linguistics, 6 (Amherst)
- \_\_\_\_\_, & Williams, E. (1985) *Introduction to the Theory of Grammar*, MIT Press, Cambridge, Massachusetts
- Wachowicz, K. A. (1974) Against Universality of a Single Wh-movement, *Foundations of Language*, 11, 155-166
- Wang, H. (1959) Ba and Bei Sentences, *Project on Linguistic Analysis (POLA)*, 1, 61-102 (translated from Chinese by W. S-Y Wang (1963))
- Wang, Li (1943, new ed. 1985) *A Modern Chinese Grammar*, Commercial Press, Beijing
- \_\_\_\_\_, (1944, new ed. 1984) *A Theory of Chinese Grammar*, Commercial Press, Beijing
- \_\_\_\_\_, (1957) \*Development of Chinese Passives, in L. Wang et al *Essays on Linguistics*, v.1, 1-16, New Knowledge Press, Shanghai
- Wang, Peter Chin-tang (1971) *A Transformational Approach to Ba and Bei*, University of Texas Ph.D dissertation
- Wang, William S-Y, (1964) Some Syntactic Rules for Mandarin, *Proceedings of the Ninth International Congress of Linguistics*, 191-202, Mouton
- \_\_\_\_\_, (1965) Two Aspect Markers in Mandarin, *Lang.* 41, 457-470
- Wasow, T. (1972) *Anaphoric Relations in English*, MIT Ph.D dissertation
- \_\_\_\_\_, (1985) Postscript, in P. Sells *Lectures on Contemporary Syntactic Theories: An Introduction to Government-Binding Theory, Generalized Phrase Structure Grammar and Lexical-Functional Grammar*, 193-205, Center for the Study of Language and Information, Stanford University, Stanford
- Weinberg, A. & Hornstein, N. (1978) *Preposition Stranding and Case-marking*, MIT & Harvard mimeographed paper
- Williams, E. (1981) Argument Structure and Morphology, *Ling. Review*, 1, 81-114
- \_\_\_\_\_, (1982) The NP Cycle, *Ling. Inquiry*, 13, 277-295
- \_\_\_\_\_, (1984a) Review Article of N. Chomsky: *Lectures on Government and Binding*, Foris, Dordrecht and *Some Concepts and Consequences of the Theory of Government and Binding*, MIT Press, Cambridge, Massachusetts, *Lang.* 60, 2
- \_\_\_\_\_, (1984b) Grammatical Relations, *Ling. Inquiry*, 15, 639-673

Yang, D.-W. (1983) The Extended Binding Theory of Anaphors, Lang. Research, 19, 169-192

Yang, Jin-ding et al (1988) \*A Dictionary of Classical Chinese, Fujian People's Press, Fuzhou

Zhu, De-xi (1984) \*Lectures on Grammar, Commercial Press, Beijing

Zhu, M. (1957) \*On the Development of Instrumental Constructions, in L. Wang et al Essays on Linguistics, v.1, 17-33, New Knowledge Press, Shanghai

\*These publications are in Chinese.