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ARGUMENT STRUCTURE, HPSG, AND CHINESE GRAMMAR

DISSERTATION

Presented in Partial Fulfillment of the Requirements for the Degree Doctor of Philosophy in the Graduate School of The Ohio State University

by

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The Ohio State University

2000

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ABSTRACT

In this thesis, I argue that in Chinese, topic structure can be uniformly treated as additional-type, thus creating a third unmarked NP or LP (locative phrase) position in a sentence (in addition to subject and object); on this analysis the empty element traditionally analyzed as a wh-trace is now treated as a null resumptive pronoun.

Words traditionally analyzed as prepositions are shown to function essentially as case markers of the NP/LP they combine with, thereby forming the marked complements in a sentence. Arguments of a verb are shown to form an list (ordered by presence/absence of proto-agent and proto-patient properties) that determines their linear order, with the most agent-like argument realized as subject, the most patient-like as the object (unmarked complement, which is always postverbal), and the remaining arguments as (preverbal) marked complements, with the marking determined by thematic properties.

Variations in sentences (such as ba- vs. non-ba-constructions) are argued to arise from valence alternations of the head verb, according to its transitivity reqirements. Transitive verbs are divided into nominal-transitives, which require NPs as their object, and locative-transitives, which require LPs as their object. Even though Chinese is shown to be an SVO language, the process of losing preposition while gaining markers has given it some SOV characteristics. This mixed word order can be seen from the ways that resultative verb compounds (RVCs) are formed. I propose that RVCs in Chinese can be not only left-headed, following the traditional head-initial system, but also right-headed, thereby giving rise to a special kind of verb -- the middle verbs -- which permits the ba-alternation. Under this analysis, multiply ambiguous sentences such as *Zhāngsān zhuīlèi-le Lǐsǐ* (meaning (a) 'Zhangsan chased Lisi and got himself tired.', (b) 'Zhangsan chased Lisi and got him tired.', and (c) 'Chasing Zhangsan got Lisi tired.') can now be explained satisfactorily.

Dedicated To my family

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2. A Lexical-Ruleless Approach to Certain Valence Alternations in Chinese. In *Proceedings of of the Seventh North America Conference on Chinese Linguistics*. (1996)

3. The Syntactic Structure of Chinese Formal Focus. In David Dowty et al. (eds.) *OSU Working Papers in Linguistics 47: Varia* 21-46.(1995)

4. The Focus Criterion: Evidence from Chinese. In Jose Camacho and Lina Choueiri (eds.) *Proceedings of the Sixth North America Conference on Chinese Linguistics, Vol 2,* 51-73. (1995)

5. Chinese NP Structure. *Linguistics* 32, 475-510. (1994)

6. Mandarin Resultative Verb Compounds with the BA-Construction. In Gail Coelho and Daniel Everett (eds.) *University of Pittsburgh Working Papers in Linguistics, Vol. II,* 1-25 (1993)

7. Chinese NP Structure. In Andreas Kathol and Carl Pollard (eds.)*OSU Working Papers in Linguistics 43: Papers in Syntax,* 88-116.(1993)

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CHAPTER 1

INTRODUCTION

1.0. Introduction

In the past few decades, linguistic studies have seen rapid developments. The traditional grammar known as the structuralism has been replaced with a more theoretic approach known as the generative grammar. Thus, linguistic studies is no longer just a process of segmenting and classifying the physical features of utterance, which is believed to be able to achieve only an observatorily adequate grammar. Instead, a higher level of a descriptively adequate grammar is sought in recent researches so that the highest level of explanatory adequacy in grammar can be achieved. As a result, linguists around the world are looking beyond the surface of languages and searching for relations between superficial demonstrations in languages. For instance, when the following sentences were studied, connections between the two were discussed.

(1) a. A man is in the garden.
b. There is a man in the garden.

The semantic similarity between (1a) and (1b) has convinced some people to argue for a transformational analysis. Since the two structures convey basically the same information, it was argued that there should be only one (abstract) underlying deep structure that the two different surface structures could be derived via transformation. Thus, a sentence similar to (1a) is generated in the abstract level known as the deep structure and this structure may surface directly into (1a). Or a transformation rule such as 'There Insertion' may change the deep structure into (1b). Thus, the semantic similarity between the two can be captured by their sharing of the same deep structure. The similarity in interpretation is guaranteed by the preservative nature of the transformations. If the rules were ordered in certain way, the subject-verb agreement can also be explained. Transformations were later developed into movement theory known as Move α in the framework of Government and Binding (Chomsky 1981, 1986).

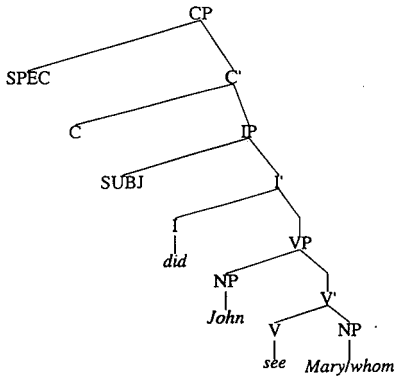
The transformational approaches have greatly eased the demand for generative power of the grammar. Linguists were searching for different sentences that may have come from

the same deep structure. Thus, sentences in (2) are argued to have the same abstract deep structure.

(2) a. John saw Mary.

b. Whom did John see?

c.



With generative-transformational grammar such as GB, only one deep structure is generated in accordance with the X-Bar theory (Jackendoff 1977, Chomsky 1881). This abstract structure is shown as (2c). However, the WH-word in English cannot stay in the object position because of scope reasons (Culicover 1993). Thus a transformational rule known as the WH-movement will move it to the front of the sentence. Other requirements such as Case Theory (Fillmore 1968, Chomsky 1981) will move *John* to the Spec of IP (the subject position) and the past tense *did* will move in accordance with Head-Movement (Chomsky 1981) to join the head of CP so the sentence will have an interrogative interpretation. Therefore, (2b) is the surface manifestation of (2c) when the object is a WH-word, after these transformations.

The X'-Theory and Move α became some of the core components of the transformational grammar. Later works try to constrain the power of those theories. For instance, while Move α is simply interpreted as to move something somewhere in natural languages, it is argued that things move only to satisfy certain requirement. For instance, WH-word moves in English because of WH-criterion, which requires WH-word to be in the SPEC position of the head of the projection that carries the feature [+WH] so that this feature can be checked off in order to have the correct logical form interpretation. Structures with unchecked features will be rendered unacceptable. In the same way, a phrase with

focus needs to move to a position that can check off the [+FOCUS] feature. In English, this is the SPEC of FP position in front of the sentence (Culicover 1993).

The preservative nature of the transformation rules was called into question by some linguists because some derived sentences do not have exactly the same semantic denotation as the sourse sentences. For instance, it is claimed that passive sentences are derived from the active sentences through the passivization rule (Relational Grammar, Permutter 1983, Radford 1988). Thus, (3a) is claimed to be the source sentence for (3b).

(3) a. Everyone in this classroom speaks two languages.

b. Two languages are spoken by everyone in this classroom.

However, it is observed that (3a) does not have the same interpretation as (3b) in that (3a) is ambiguous between whether *everyone* has wider scope over *two languages* or *two langauges* has wider scope over *everyone*. But in (3b) only *two languages* has the wider scope reading. The difference between the two sentences and other such sentences is used to argue for non-transformational approaches in the syntax of languages. Thus, in HPSG, sentences in (3) are argued to be seperately generated and it is the different syntactic information carried in the verbs that determined the different structures of the sentences. The semantic similarity between the sentences in (3) is believed to be attributed to the related lexical items and the relation between the two can be captured by lexical rules.

As for the WH-questions in English, HSPG also treats them as base generated. A WH-word at the beginning of the sentence is said to be the filler which licenses a gap within the sentence. The filler-gap relation is denoted by a SLASH feature operating in accodance with the Foot-Feature Principle. Thus, a WH-question is just like a yes-no question headed by an interrogative auxiliary verb.

1.1. Syntactic Studies in Chinese

There are some major studies in modern Chinese grammar represented in Lin (1947) and Wang (1957). These studies are introduced to the West through Chao (1968)'s English version of *A Grammar of Spoken Chinese* where traditional techniques were used in the analysis. However, the generative-tranformational grammar was not introduced into Chinese grammar until the late sixties and early seventies.

1.1.1. Li and Thompson and the Transformational approaches

Among the first to analyze Chinese within the generative-transformational grammar were Hashimoto (1964), Tai (1973), Thompson (1973b) and Li (1976). Li and Thompson (1981) have a very good summary on the linguistic findings during this period.

One of the major features in Chinese grammar is the *bǎ*-construction. The word *bǎ* was used as a verb in archaic Chinese to mean 'hold with hand'. However, in modern Chinese, it seems to have lost its verbal function and it is used to introduce a nominal phrase in front of a verb. Wang (1957) defines *bǎ*-construction as the 'disposal' form which 'states how a person is handled, manipulated, or dealt with'. Li and Thompson (1981) give a simpler explanation of 'disposal' as 'to take and do something about'. Following are some examples of *bǎ*-construction.

(3) a. Zhāngsān bǎ Lǐsì shuāidǎo-le.
Zhangsan BA Lisi throw-fall-PER
'Zhangsan has thrown Lisi (to fall) to the ground.'

b. Mǎlì bǎ qìchē mài-le.
Mary BA car sell-PER
'Mary has sold the car.'

It has been noted (Thompson 1973, Tai 1973, Hashimoto 1964, etc) that the sentences in (3) have the same readings as (4), respectively.

(4) a. Zhāngsān shuāidǎo-le Lǐsì.
Zhangsan throw-fall-PER Lisi
'Zhangsan has thrown Lisi (to fall) to the ground.'

b. Mǎlì mài-le qìchē.
Mary sell-PER car
'Mary has sold the car.'

Hashimoto suggests that (3a) and (4a) or (3b) and (4b) share the same deep structure and transformational rules will take care of the different surface structures. Thompson (1973) suggests that the (b) sentences are the same as the deep structures and the Object Fronting Rule will transform the deep structures into (b) as the surface structures. Gao (1991) suggests that the transformation is motivated by polysyllabicity conspiracy in modern Chinese. Tai (1973), however, assumes that the (a) sentences is the deep structure and claims that Chinese is an SOV language. Travis (1984) agrees with Tai and argues that the preverbal NP moves to postverbal position to get Case. Huang (1991) argues that the preverbal NP does not move. Instead, the main verb will move to the left of the NP to assign Case to it. On the non-transformational front, Gao (1993) suggests that both sentences are base generated and the similarity between the two can be captured by some lexical rules.

A related issue in the studies of *bǎ*-construction is that not all sentences have *bǎ* and non-*bǎ* alternation. Constraints have been proposed to explain this phenomenon. Hashimoto suggests a two-clause analysis of the resultitive verb compounds and argues that, when there is a match between the matrix object and embedded subject, the *bǎ*-construction is licensed. Gao (1991) proposes a configurational analysis for the two clause

model. Chang (1989) and Ross (1990) suggest a lexical approach to the problem. In later chapters of this paper, I will examine those analyses closely and propose a more satisfactory analysis.

1.1.2. James Huang and GB

Starting from early nineteen-eighties, linguists began to search for answers to various aspects of language similarities and differences. For instance, a WH-word in languages such as English tends to be found at the beginning of a question with a piece of the same category as the WH-word in the rest of the sentence missing. The tranformational approaches believe that the wh-word is base-generated within the sentence but is later moved to the beginning of the sentence. The reason for the movement is argued to be that the WH-word needs to be in a position to have a scope over the sentence in order to make the whole sentence a question (Chen 1993). This position is seen in GB theory to be the position that can c-command the rest of the sentence and therefore have it under its domain. This explanation is intended to be universal. Thus for languages such as Chinese, Japanese, etc. where no such syntactic movement is found (the WH-in-situ langauges), Jame Huang (1982) proposes that there is another level of structure, known as the logical form (May 1985), where the WH-words will have to move to the position that can dominate the rest of the sentence. Thus, the difference between English and Chinese is only that the WH-feature is strong in English so that syntactic movement is triggered while, in Chinese, the WH-feature is so weak that the WH-movement must be delayed until in the logic form. Thus, even though the two langauges are syntactically different, they have the same logical forms. However, difference still exists in Chinese. Aoun and Li (1993) note that in English multiple WH-questions are possible in sentences like the following.

(5) John wonders who ate what at the party.

In (5) both *who* and *what* can have wide scope so that a multiple wh-question is formed. However, if one of the wh-words is an adjunct such as *where* or *why*, only the argument wh-word can have wider scope.

(6) John wonders who did not come why.

Thus (6) is not a possible multiple wh-question since the adjunct wh-word *why* cannot have wide scope. However, in Chinese the distinction between the argument wh-words and the so called adjunct wh-words seems to have disappeared.

(7) a. Tā xiǎng zhīdào shéi chī-le shěnmo.
he want know who eat-PER what
'He wonders who ate what.'

b. Tā xiǎng zhīdào shéi wèi-shěngmo méiyou lái.
he want know who why not-PER come
'He wonders who did not come and why.'

c. Tā xiǎng zhīdào shéi zài-nǎer chī-le wǎnfàn.
he want know who where eat-PER late-meal
'He wonders who had dinner and where.'

In (7) multiple wh-questions are possible in all the sentences. However, this may not necessarily mean that the logical forms for wh-questions in English and Chinese should be different. In this paper, I hope to provide evidence to show that those so called adjunct wh-words are actually (marked) complements, just like the (postverbal) object of the sentence.

1.1.3. Lisa Travis and the Status of *bǎ*

Another related issue in the studies of *bǎ*-construction is how the word *bǎ* should be treated. In earlier generative-transformational approaches, it is generally classified as a coverb (Thompson 1973) because of its historical background. As Li and Thompson (1981) note, coverbs are not verbs because they cannot function as the main predicate of the sentence. They are not exactly the Chinese counterpart of the English prepositions, either, since some of them can be inflected. However, Gao (1993) has shown that *bǎ* does not have any verbal characteristics in contemporary Chinese, even though it was once used mainly as a verb.

Travis (1984) proposes that theta-role assignment and Case assignment may take different directions in different languages, hence determining the word order of a sentence in that language. For instance, in Japanese, verbs always assign their theta-roles and Cases to the left, resulting in Japanese being an SOV language. She suggests that the alternation between *bǎ* and non-*bǎ* constructions in Chinese is the result of directionality conflict between theta-role assignment and Case assignment. She claims that, in Chinese, a verb assigns its theta-role to its left and its Case to its right. Under this analysis, Chinese is underlyingly an SOV language and the word *bǎ* functions just as a Case marker. Li (1985) extends the Case Filter to cover not only NPs but also clauses in Chinese. She claims that Chinese is basically an head-final language except under case-assignment requirement. However, for lack of evidence to prove *bǎ* as a Case marking preposition, she suggests that it is a (weakened) verb. Huang (1991) treats *bǎ* as a light verb but the NP after it is not treated as the internal argument of theta-role assigning verb. Instead, the NP after *bǎ* is argued to be the external argument and *bǎ* assigns the exceptional Case to it.

Some other analyses such as Tsao (1987) and Gao (1991) argue that *bǎ* is a secondary topic marker. These issues will be taken up in various chapters of this paper.

1.1.4. Other Theories (Functionalism: James Tai, LFG: C-R Huang, HPSG: Carl Pollard)

Word order in Chinese is also considered in other syntactic frameworks. Tai (1985) argues within the cognition-based grammar approach that iconicity must be a valid issue when word order in natural languages is considered. He claims that the temporal sequence of events determines the word order in a Chinese sentence. Thus in this analysis, the source argument is always considered to be before the goal argument just as they are ordered in real life sequence. In LFG, Bresnan (1988) and Huang (1989) have argued for the same ordering in the argument hierarchy in several languages including Chinese. And this heirarchy is then mapped into linear ordering of arguments in a sentences with special features like [± o] and [± r]. Huang (1991) uses these features to create some special arguments called the applied arguments and the linear order of sentential elements are determined by these features.

Carl Pollard and Ivan Sag (1992) argue that binding principles should be more appropriate when obliqueness of arguments is used. The obliqueness binding principles are used to explain the behavior of the Chinese long-distance anaphor *ziji* in Pollard and Xue (1998).

All the above arguments and proposals will be closely examined in later chapters and new analysis will be presented for the explanation of linear order of sentential elements in Chinese.

1.2. Theoretic Framework

The analysis in this paper will be conducted within the theoretical framework of Head-Driven Phrase Structure Grammar (HPSG), the basic framework of which is laid out in Pollard and Sag (1994). Here I only make a brief introduction to some of the basic components relevant to this paper.

1.2.1. Features and Lexical Entries

In HPSG, all the linguistic entities are said to be signs. Thus there are two basic subsorts of signs known as words and phrases. Words are the lexical entries from the lexicon and phrases are formed by combining linguistic signs according to phrase structure rules.

Each linguistic sign has a set of features and the values of these features tell all the necessary information about the syntactic function and lexical status of that sign. For instance, the word *chīle* 'eat' may have the following lexical entry.

(8) the verb sign of the *chīle*

$$\begin{bmatrix} \text{PHON } \langle \textit{chīle} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD } \textit{verb} \begin{bmatrix} \text{VFORM } \textit{perfective} \end{bmatrix} \end{bmatrix}$$

Thus from (8) we can tell that *chīle* is a perfective verb, a verb inflected with the perfective morpheme *-le*.

Another function of the feature system is to show agreement in languages. Agreement exists in various ways in different languages. In Chinese, a typical agreement is between a noun and its classifier. Below is a lexical entry for the classifier *wǔ-tiáo* 'five (fish, boats, streets, etc.)'.

(9) the classifier *wǔ-tiáo*

$$\begin{bmatrix} \text{PHON } \langle \textit{wǔtiáo} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD } \textit{classifier} \begin{bmatrix} \text{SPEC } \textit{N}' \begin{bmatrix} \text{NUMBER } \textit{plural} \\ \text{SHAPE } \textit{tiao} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Form (9) we know that *wǔ-tiáo* is a classifier and it specifies that the nominal (phrase) that it combines with must have *tiao* as its agreement feature, such as *yú* 'fish', *chuán* 'boat' or *jiē* 'street'.

1.2.2. Phrase Structure Rules

Phrase structure rules determine the syntactic structure of phrases in a language. In HPSG phrase structure rules take the form of immediate dominance (ID) rules. The following are the basic ID schemata in HPSG.

(10) a. Head-Subject Schema: XP[SUBJ < >] --> [1]YP, XP[SUBJ <[1]>]
SUBJ HEAD

b. Head-Specifier Schema: XP --> [2]YP[SPEC [1]], [1]X'[SPR <[2]>]
SPR HEAD

c. Head-Comps Schema: X' --> [1], X^0[COMPS [1]]
COMPS HEAD

d. Head-Adjunct Schema: X' --> YP[MOD [1]], [1]X'
ADJUNCT HEAD

More schema will be added later when needed, such as the topic-comment schema in Chapter 2.

1.2.3. The Binding Theory

In this thesis, I will also adopt the Binding Theory discussed in Pollard and Sag (1992), where the binding relation is no longer a configurational one, as it is in GB and its later development. Instead, arguments are said to form a hierarchy accoding to their relative obliqueness and an argument can always serve as a potential binder for an anaphoric expression in a less oblique (co)argument. The binding theory is stated below (Pollard and Sag 1992).

(11) Binding Theory

A. A locally o-commanded anaphor must be locally o-bound.

B. A personal pronoun must be locally o-free.

C. A nonpronoun must be o-free.

(12) Definitions of O-Command and O-Binding

A o-commands B just in case A locally o-commands some C dominating B.

A o-binds B just in case A and B are coindexed and A o-commands B. If B is not o-bound, then it is said to be o-free.

1.3. Organization of the Paper

This paper is organized as follows. In Chapter 2, I examine the topic structure in Chinese and several previous analyses are closely examined and compared. It will be shown that the English style topicalization analysis cannot explain the relations between the topic and rest of the sentence in Chinese. Instead, I argue that topic in Chinese need be treated uniformly as additional type and is base-generated to the left of the subject via lexical rules, where the added topic is required to bear an aboutness relation with the comment clause.

In Chapter 3, I compare topic with other argument positions such as subject and object in a sentence and show that topic, just like subject and object, is also an unmarked NP/LP position. With a large amount of data, many prepositions/coverbs in traditional analysis are shown to occur only with NPs/LPs when they are not in the topic, subject, or object positions. The function of those so-called prepositions is no more than just to case-mark the NPs/LPs that follow and their appearances are predictable by the thematic roles they play in a sentence. Therefore, I argue that these elements are better treated as markers rather than prepositions and they are used to form marked complements in a sentence. The same argument can vary either as a marked NP/LP or unmarked NP/LP, depending on the argument structure of the verb. I call the variation valence alternation.

In Chapter 4, I argue that the SUBCAT value of a verb is an ordered list of arguments, which are arranged, according to the proto-role properties, with the most agent-like as the

first and the most patient-like as the last. The linear order of those arguments in the sentence directly reflects the arrangment with the first argument of the verb as the subject and the last argument as the object if the verb is a transitive one.

In Chapter 5, I show that it is necessary to distinguish NPs from LPs categorically in Chinese. LP's are formed when NPs are affixed with postpositional locative endings. Transitive verbs are divided into nominal transitives that require NPs as their object and locative transitives that require LPs as their object. The syntactic requirement can override the direct mapping from argument structure to linear order of the sentential phrase structure, hence explaining the appearant counterexamples raised in Chapter 4.

In Chapter 6, I re-examine some of the classic arguments whether Chinese is an SVO or SOV language and claim that Chinese is still fundamentally an SVO language but displaying some SOV properties. The mixed type is clearly seen from the ways resultative verb compounds (RVCs) are formed, either right-headed, representing the traditional SVO word order, or left-headed, that creat an special kind of verbs known as middle verbs. With the newly proposed analysis of RVCs, some multi-ambiguous sentences can be explained.

In Chapter 7, the analysis for RVCs in Chapter 7 is extented to resultative clauses. Chapter 8 summerizes the thesis and additional data from Archaic Chinese are cited in appendix to show that Archaic Chinese is fundamentally prepositional and hence an SVO language.

Chaper 2

TOPIC IN CHINESE

2.1. The Structure of Topic

2.1.1. The Notion of Topic

Topic, in its colloquial usage, refers to the theme of a conversation. However, in linguistics, it may have various usages. In semantics the word 'topic' is often used together with 'comment' in contrast to the distinction between subject and predicate of a sentence. Thus the topic of a sentence is the person or thing about which something is said, whereas the further statement made about this person or thing is the comment. Although the topic in this use is often said to coincide with the notion of subject, it may be any part of the sentence in the sense of information structure (Craig Roberts 1996). It is argued (Fukushima 1999) that topic bears an *aboutness* relation with the rest of the sentence. In this usage, topic is said to depict the salient information from the context. Thus, any component of a sentence, if it is used to answer an information question, can be said to be the topic. For instance, the underlined expressions in the following (b) sentences are said to be the topic in this sense.

(1) a. What did John give to Mary?
    b. John gave a book to Mary.
(2) a. Who did John give a book to?
    b. John gave a book to Mary.

Thus, in (1b) *a book* serves as the topic of the sentence and in (2b) the topic is *Mary*. However, this is not what we use 'topic' for in this thesis.

Topic, in this work, is a syntactic notion. It refers to a syntactic component of a sentence that appears to the left of the subject (in Chinese, at least). Thus the underlined expressions in the following examples in Chinese are the topic of the sentences.

(3) a. Zhè-kē shù yèzi hěn dà.
    this-CL tree leaf very big
    'This tree has very big leaves.'

b. Nèizhǒng yú wǒ zuótiān diào-le wǔ-tiáo.
that-kind fish I yesterday angle-PER five-CL
'As for that kind of fish, I caught five of them yesterday.'

As we can see in (3a), *yèzi* 'leaf' is the subject because the predicate *hěn dà* '(be) very big' is a descriptive statement made about it. The expression *zhè-kě shù* 'this tree' is a syntactic constituent of the sentence but it occupies the position to the left of the subject, therefore it qualifies for the notion of topic used in this thesis. The same is true of *nèizhǒng yú* 'that kind of fish' in (3b).

2.1.2. Topic Prominent Languages

In the literature, topic prominence is used in contrast with subject prominence (Chafe 1976). Thus languages like English are subject oriented, in that the subject is an obligatory syntactic component in a sentence. Topic, on the other hand, is not. In English, topic is typically discussed in tranformational approaches such as GB as a derived structure, either through topicalization or left dislocation (Ross 1967, Chomsky 1981, Huang 1982, 1984, Xu and Langendoen 1985, Rochemont and Culicover 1990, Culicover 1992, etc.). That is, in an English sentence with topic, we always see a semantically dependent element to the right of the topic. Thus, in (4b) the dependent element is an empty category known as a trace and in (4c) it is a pronoun.

(4) a. I know John.
b. John$_i$, I know t_i .
c. John$_i$, I know him$_{i/j}$.

The similarities between (4b) and WH-questions in English are often cited as evidence for a transformational analysis for topic structures. Thus (4b) is analyzed as derived from a deep structure that is the same as (4a). That is, *John* is generated as the object of the verb *know* in the deep structure and is later moved to the topic position in the surface structure and leaves a trace that is coindexed with it for interpretation. Hence the term topicalization.

In a topic prominent language, on the other hand, there is no need for a referentially dependent expression to occur to the right of the topic, although certain semantic relations usually hold between the topic and some element to its right. The following examples from Japanese (Kuno 1973, Shibatani 1990) and Korean (Yoon 1987, Chung 1997) show this.

(5) Onsen-wa kimoti-ga ii
hot-spa-TOP feeling-NOM good
'As for a hot spa, one feels good (about it).'

(6) Zoo-wa hana-ga nagai
elephant-TOP nose-NOM long
'An elephant is such that its trunk is long.'

(7) Yenkuk-un John-i Shakespeare-lul coahay
play-TOP John-NOM Shakespeare-ACC like
'As for plays, John likes Shakespeare.'

(8) Ku namwu-nun Mary-ka kaci-lul calassta
the tree-TOP Mary-NOM branch-ACC cut
'As for the tree, Mary cut its branch.'

2.1.3. Characteristics of Topic in Chinese

Topic structure in Chinese has been discussed intensively in the literature, e.g. by Huang (1982) and (1984), where he argues strongly for a topicalization analysis for Chinese examples like (9) in the following.

(9) Zhāngsān$_i$ wǒ rènshi t_i
Zhangsan I know
'Zhangsan, I know

(10) Zhāngsān$_i$ wǒ rènshi tā$_{i/*j}$
Zhangsan I know he
'Zhangsan, I know him.'

Apparently these examples resemble the English ones given in (4) and can be analyzed on a par with their English counterparts.[1] However, there is a large body of topic structures that cannot be analyzed this way. In Xu and Langendoen (1985) we note the following.

(11) Shuǐguǒ, Zhāngsān zuǐ xǐhuān mǎi píngguǒ
fruit Zhangsan most like buy apple
'As for fruits, Zhangsan likes most to buy apples.'

(12) Yú, Zhāngsān tèbié xǐhuān chī huángyú
fish Zhangsan especially like eat yellow-fish
'As for fish, Zhangsan especially likes to eat yellow croaker.'

As Xu and Langendoen point out, in these examples, though anaphoric expressions are not found to the right of the topic, certain semantic relations exist between the topic and some constituent in the comment. In (11) we understand that apples are a kind of fruit and in (12) yellow croaker is understood to be a kind of fish. Without such relations, the topic structures are not acceptable,[2] as is shown in the following.

[1] However, there is a difference between (4b) and (10) in that, in (4b) the object position is occupied by a pronoun and the coindex between the topic and the object is by disjoint reference. In (10), the object position is occupied by a resumptive pronoun, which is assumed to be a lexically realized trace.

[2] The same is true in Japanese. Shibatani (1990) has the following examples:

(i) Tori-wa mesu-ga tamago-o umu.
bird-TOP female-NOM egg-ACC lay
'A bird is such that a female (bird) lays eggs.'

(ii) *Tori-wa kaeru-ga tamago-o umu.
bird-TOP frog-NOM egg-ACC lay
'A bird is such that a frog lays eggs.'

(13) *Shuǐguǒ, Zhāngsān zuì xǐhuān mǎi niúròu
fruit Zhangsan most like buy cow-meat
'*As for fruits, Zhangsan likes most to buy beef.'

(14) *Yú, Zhāngsān tèbié xǐhuān chī huāshēng.
fish Zhangsan especially like eat peanut
'*As for fish, Zhangsan especially likes to eat peanuts.'

It might be argued that this relation is just what is needed to analyze the topic structure in the language. For instance, it may be suggested that the topic is base generated somewhere within a structure where this relation is syntactically expressed. For example, the topicalized elements in (11) and (12) might originate as modifiers within structures like those in (15) and (16).

(15) Zhāngsān zuì xǐhuān mǎi shuǐguǒ-lǐ de píngguǒ
Zhangsan most like buy fruit-in DE apple
'Zhangsan likes most to buy apples, among all the kinds of fruits.'

(16) Zhāngsān tèbié xǐhuān chī yú-zhōng de huángyú
Zhangsan especially like eat fish-among DE yellow-fish
'Zhangsan especially likes to eat yellow croaker, among all the kinds of fish.'

There are many problems for such an analysis. First, there is the category issue. Note that the topic in (11), for instance, is not exactly the same as the modifier in (15). It is only a part of the modifier. Then there are the theoretical issues. For example, if we look at the fact that the topic is within the modifier and a modifier is generally analyzed as an adjunct, then we cannot extract the topic from an adjunct without crossing a barrier and hence violating constraints on Move α.[3]

[3] The following are some examples to show that extraction from adjunct is prohibited.

(i) a. Zhāngsān shàng xiǎoxué de shíhòu sǐ-le fùqin.
Zhangsan attend elementary-school DE time die-PER father
'When Zhangsan was in elementary school his father died .'

b. *Xiǎoxué$_i$ Zhāngsān shàng t_i de shíhòu sǐ-le fùqin.
elementary-school Zhangsan attend DE time die-PER father

c. *Zhāngsān shàng t_i de shíhòu sǐ-le fùqin de xiǎoxué$_i$
Zhangsan attend DE time die-PER father DE elementary-school

(ii) a. Tā bèi nèi-ge rén dǎshāng-le.
he by that-CL person hit-wound-PER
'He was wounded by that person.'

b. *Nèi-ge rén$_i$ tā bèi t_i dǎshāng-le.
that-CL person he by hit-wound-PER

c. *Tā bèi t_i dǎshāng-le de nèi-ge rén$_i$
he by hit-wound-PER DE that-CL person

Thus in (i) *shàng xiǎoxué de shíhòu* 'when (he) attended elementary school' is a time adverbial clause, hence an adjunct modifier for the main clause and no topicalization or relativization of the object NP from the adjunct clause is possible. In (ii) the agentive phrase *bèi nèi-ge rén* 'by that person' is considered to be an adjunct prepositional phrase and therefore extraction of the NP after *bèi* is ruled out.

The following examples (Huang 1989, Her 1991), however, provide evidence that topic structure in Chinese should be treated as base-generated rather than derived.

(17) a. Zhè-jiàn shì, zhǐyou Zhāngsān cái néng zuò zhǔ.
this-CL matter only Zhangsan alone can make master
'On this matter, only Zhangsan himself can make decision.'

b. *Zhǐyou Zhāngsān cái néng zuò zhǔ zhè-jiàn shì.
only Zhangsan alone can make master this-CL matter

(18) a. Zhè-gè gōngzuò, nǐ yào fù zérèn.
this-CL work you need bear responsibility
'For this work, you should take responsibility.'

b. *Nǐ yào fù zérèn zhè-gè gōngzuò
you need bear responsibility this-CL work

The topics in (17) and (18) are unlike those in (11) and (12) in that there are no obvious syntactic relations between the topics and any of the constituents in the comment clauses. A topicalization analysis does not work for them since there are no empty positions in the comment clauses that they can be said to have been moved from. These examples are typical of Chinese topic structures, hence the term 'Chinese style topic' (Chafe 1976). It is based on these Chinese style topic structures that we believe that Chinese topic should be analyzed as base-generated rather than derived.

2.1.4. The Distinction between Topic and Subject

Although the topic is defined as the syntactic constituent to the left of the subject, sometimes the subject and the topic are not so easy to distinguish. Some (LaPolla 1990, Schachter 1976) have suggested that Chinese does not have subject and the so-called subjects in the traditional analysis are actually topics. For others like Ma (1898), Wang (1957), Lü (1956), and Chao (1968), all the syntactic elements before the predicate of the sentence are subjects. They suggest that the topic is actually an extended subject. This is because the distinction between topic-comment and subject-predicate is really not a purely syntactic one. So the predicate can also be said to be a comment on the subject. This is especially so when subject-predicate expressions function as predicates. Examine the following.

(19) a. Tā tóu$_{\tau}$ téng.
he head ache
'He has a headache.'

b. Tā (duì zhè-jiàn shì) hěn tóu téng.
he towards this-CL matter very head ache
'This matter gives him headache.'

c. Tā (de) tóu hěn téng.
he DE head very ache
'He has a severe headache.'

As we can see in (19), the treatment of *tā* 'he' as a topic is really not clear-cut. From (19b), we see that *tóu téng* 'head-ache' is a noun-adjective compound predicate because it can be modified by the adverb *hěn* 'very'. Note that *hěn* 'very' is an adverb because it does not modify nominals. Thus the first constituent *tā* 'he' may just be analyzed as the subject. However, in (19c) the adverb *hěn* 'very' is just before the adjective *téng* 'ache', which is now the predicate. Thus *tóu* 'head' must be analyzed as the subject. But this still does not necessarily make *tā* 'he' the topic of the sentence, as some may srgue. For instance, the optional *de*, a possessive indicator, may be used to argue for a posessive analysis of *tā* 'he'. Therefore it can be argued that (19a) does not necessarily show a topic-comment structure.

However, the above argument is challenged with a closer look at the examples. First, the reason that *tóu teng* 'head ache' can be analyzed as a single predicate in (19b) is because it is an idiom. In Chinese, a synonym for *tóu* 'head' is *nǎodài* 'head'. If we replace *tóu* with *nǎodài* in (19b), then the noun-adjective predicate analysis is no longer available. This is shown in (20) below.

(20) *Tā (duì zhè-jiàn shì) hěng nǎodài téng.
he towards this-CL matter very head ache
Intended: 'This matter gives him headache.'

Second, the reason that the modifier-modified analysis holds for *tā* 'he' and *tóu* 'head' in (19c) is because of the special (physical) whole-part relation between the two, and *de* is just the word to show this relation. Without this special relation, the modifier-modified analysis is no longer available. Examine the following.

(21) Yú (*de) huángyú zuì hǎochī.
fish DE yellow-fish most delicious
'Of all the fish, yellow croaker is the most delicious.'

Thus, in (21), *huángyú* 'yellow croaker' is not (physically) part of *yú* 'fish' and therefore cannot be modified by *yú* 'fish'.

Another problem for the modifier-modified analysis in (19c) is that the modifier position can be filled with a resumptive pronoun and the sentence is still acceptable. Examine the following.

(22) a. Lǐsì (de) tóu hěn téng.
Lisi DE head very ache
'Lisi has a severe headache.'

b. Lǐsì$_i$ tā$_i$ de tóu hěn téng.
Lisi he DE head very ache
'He has a severe headache.'

The fact that (22b) is fully grammatical shows that (22a) needs at least two different analyses. With *de*, *Lǐsì* and *tóu* bear the modifier-modified relation. But without *de*, *tā* needs to be analyzed as the topic while *tóu* 'head' is the subject.[4]

We have shown that the topic position is necessary and cannot be conflated with the subject. The distinction between the two is not difficult to make syntactically. The topic must always be the syntactic constituent such as an NP or LP to the left of the subject within the boundary of a clause.

Li and Thompson (1981) also make some interesting observations in distinguishing topic from subject. They note that there is generally a longer pause between the topic and the rest of the sentence. They use a comma to indicate the pause. They also note that, in Chinese, a topic can be optionally marked by *a*, a word widely regarded as the equivalent of Japanese *wa*.

(23) a. Zhōngguó, rénkǒu hěn duō.
China population very many
'In China, there are a lot of people.'

b. ?*Zhōngguó rénkǒu, hěn duō.
China population very many

(24) a. Zhāngsān$_i$ a, wǒ rènshi tā$_i$
Zhangsan TOP I recognize he
'As for Zhangsan, I know this guy.'

b. *Zhāngsān$_i$, wǒ a rènshi tā$_i$
Zhangsan I TOP recognize he

Jiang (1992) also argues for a distinction between topic and subject. He argues that there are two types of preverbal NP's in Chinese sentences. Type A NP's can only combine with what he calls Pred's and Type B NP's can only combine with what he calls Comm's. He notes that the Pred's and Comm's have different structures with respect to the types of modifiers, negations, comparatives, and auxiliary verbs. He concludes that Pred's are what we know as VP's and Comm's are the S's. Thus, Type A NP's must be the subjects since they only combine with VP's and Type B NP's need to be treated as topics because they only combine with S's. Although Jiang's analysis is within a different

[4] The necessary relation between the two in these examples can be captured with a proposed empty category *refo* within the subject NP. This is discussed later in this Chapter.

theoretic framework than ours here, we agree on the structure of a topic sentence. That is, a topic must combine with a sentence.

2.1.5. Topic-Comment Structure

We have shown that the topic in Chinese is best analyzed as base-generated to the left of the subject. In HPSG, all linguistic expressions belong to the sort *sign*. Signs have subsorts *word* and *phrase*. A word is a lexical item and a phrase has an internal syntactic structure. So in addition to PHON and SYNSEM, a phrase also has the attribute DAUGHTERS (DTRS), whose value is a feature structure of the sort *constituent-structure* (*con-struc*) representing the immediate constituent structure. Constituent structures are generated according to the immediate dominance (ID) rules, known as schemata. For instance, a verb phrase (VP) is generated according to the Comps-Head Schema while a sentence is generated according to the Subject-Head Schema, as shown below.

(25) a. Comps-Head Schema XP --> [1], X[COMPS <[1]>]
COMPS HEAD

b. Subject-Head Schema XP --> [1]YP, XP[SUBJ <[1]>]
SUBJ HEAD

According to (25a), we understand that a VP is a structure with a list of complement daughters and a head daughter that is looking for some complements. A sentence, according to (25b), is a structure with a subject daughter and a head daughter that is looking for a subject. Generally, the head daughter of a VP is the verb and the head daughter of a sentence is the VP. Thus, a sentence can also be understood as a subject saturated VP.

Previously, we have argued that the topic in Chinese is base-generated to the left of a subject. For a structure to be base generated means we must have a phrase structure rule for that structure. Topic being base generated means that the topic is part of the sentence and the topic being to the left of the subject means that the head of the structure must contain the subject, assuming that Chinese is an SVO language. In HPSG terms, this means the phrase that contains a topic must have a topic daughter and a head daughter that contains the subject. Following tradition (Jiang 1992), we call the head daughter the *comment*. Thus the comment must be a subject saturated phrase. The topic-comment structure described here needs to be generated by a new ID rule, the Topic-Head Schema. The new rule is shown as (25c)

(25) c. Topic-Head Schema S --> [1]XP, S[TOPIC <[1]>]
TOPIC HEAD

The schemata in (25) describe a sentence in Chinese as a hierarchical structure[5]. It states a comment clause is a structure with a topic daughter and a head daughter that is looking for a topic. Generally, the head daughter of a comment clause is a sentence (a subject saturated VP). Since topic is not subcategorized by the verb, it is not on the SUBCAT list of the head verb. Thus not all sentences in Chinese require a topic. But topic can always be added to a sentence. To add a topic to a subject-saturated phrase (the comment clause), I propose the following lexical rule.

(26) Topic Addition Lexical Rule

$$\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD verb} \\ \text{TOPIC } \langle\, \rangle \\ \text{SUBCAT } \boxed{1} \end{bmatrix} \\ \text{CONTENT } \boxed{2} \end{bmatrix}$$

$$\Downarrow$$

$$\begin{bmatrix} \text{CAT} & \begin{bmatrix} \textit{HEAD verb} \\ \text{TOPIC } \langle \text{XP}_{\boxed{3}} \rangle \\ \text{SUBCAT } \boxed{1}\langle (\text{YP}_{\boxed{3}}) \rangle \end{bmatrix} \\ \text{CONTENT } \boxed{2} \\ \text{CONTEXT|BACKGROUND} & \begin{bmatrix} \textit{about} \\ \text{TOPIC } \boxed{3} \\ \text{COMMENT } \boxed{2} \end{bmatrix} \end{bmatrix}$$

Thus, a topic strucutre described by schemata in (25) can be seen as the following.

(27) the structure of verbs heading a sentence containing a topic

a.

$$\begin{bmatrix} \text{PHON } \boxed{1} \\ \text{SYNSEM|LOCAL|CAT} & \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{SUBCAT } \langle \boxed{2}, \boxed{3} \rangle \\ \text{TOPIC } \langle \text{NP} \rangle \\ \text{SUBJ } \langle \boxed{2}\text{NP} \rangle \\ \text{COMPS } \langle \boxed{3} \rangle \end{bmatrix} \end{bmatrix}$$

b.

$$\begin{bmatrix} \text{PHON } \boxed{1} \\ \text{SYNSEM|LOCAL|CAT} & \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{SUBCAT } \langle \boxed{2}, \boxed{3} \rangle \\ \text{TOPIC } \langle \text{NP}_{\boxed{4}} \rangle \\ \text{SUBJ } \langle \boxed{2}\text{NP} \rangle \\ \text{COMPS } \langle \boxed{3}\text{NP}_{\boxed{4}} \rangle \end{bmatrix} \end{bmatrix}$$

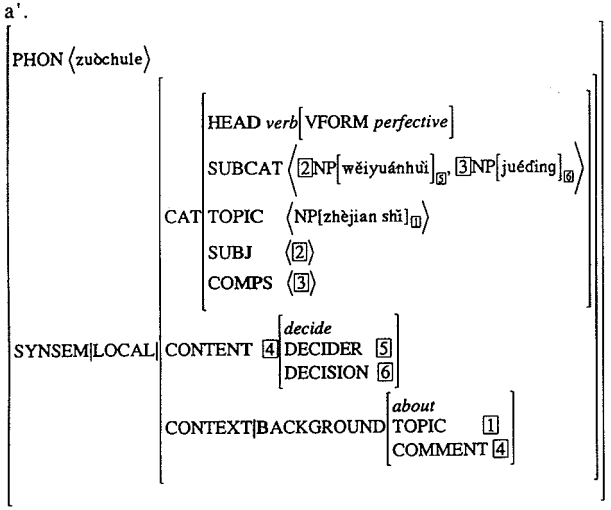
Instantiations of (27) are illustrated in (28).[6]

[5] In this paper, we do not adopt the flat structure analysis, as has been used in some head-final language analysis such as Korean (Chung 1997). In a flat structure analysis, the subject and complements are checked off from the SUBCAT list in just one step in accord with the Subcategorization Principle and therefore the structure is not a hierarchical one.

[6] In all lexical entry matrices, the words in square brackets are for expository purposes only, not part of the formal description.

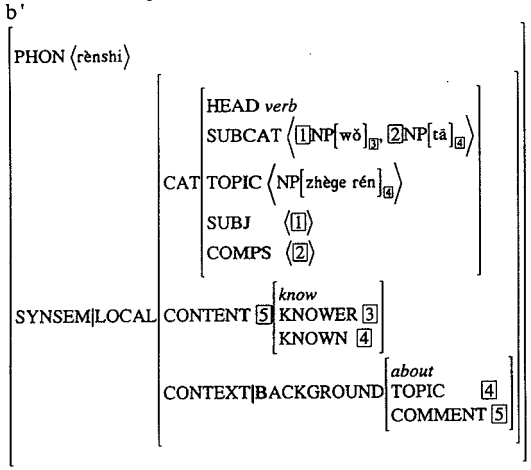
(28) a. Zhè-jiàn shi, wěiyuánhuǐ yǐjīng zuòchu-le juédǐng.
this-CL matter committee already make-out-PER decision
'On this matter, the committee has already made a decision.'

a'.



(28) b. Zhè-ge rén, wo rènshi tā.
this-CL person I know he
'As for this person, I know him.

b'



The topic-comment schema describes Chinese topic structure always as the additional- type (Fukushima 1999). That is, it is always possible to add a topic to a full sentence as long as the pragmatic constraint is satisfied, that the topic must bear an *aboutness* relation with the comment sentence. Thus, in (28a), we understand that the relation between the topic ***zhè-jiàn shǔ*** 'this matter' and the comment sentence ***wěiyuánhuǐ yǐjīng zuòchu-le juédǐng*** 'the committee has already made a decision' is that the decision is *about* this matter. This *aboutness* relation is especially clear when there is an element in the comment sentence that is coindexed with the topic, as is the case of (28b), where a resumptive pronoun[7] is used in the object position to make sure that 'the person I know' is ***zhe-ge rén***, not any one else.

As for the topicalized topic structure in (9), we agree with Xu and Langendoen (1985) that the empty category in the object position is a null (resumptive) pronoun,[8] not a trace. In this way, we can analyze (9) on a par with (28b).[9] We repeat (9) as (28c) and give the structure as (27c') below.

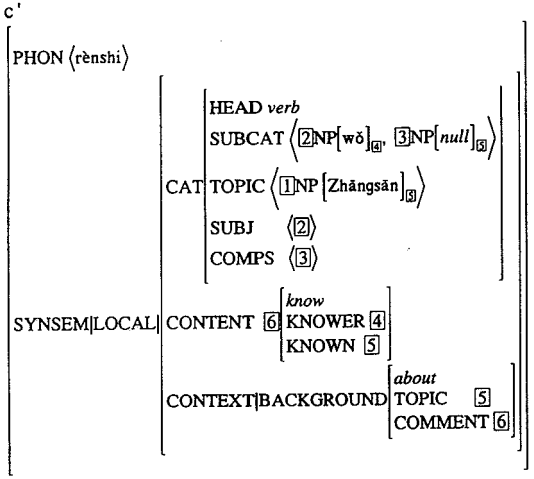
(28) c. Zhāngsān$_i$ wǒ rènshi e_i
Zhangsan I know
'Zhangsan, I know.'

[7] As a matter of terminology, we call a pronoun in a comment or relative clause resumptive if its antecedent is the topic of the comment or the head noun of the relative, respectively. Like other (nonreflexive) pronouns, resumptive pronouns are subject to binding principle B, i.e. they cannot be o-bound by a co-argument. In (27b), the resumptive pronoun must be bound by the topic.

[8] However, the null pronoun cannot just be a regular pronoun because, by the disjoint reference property of an o-free pronoun, a pronoun can be coindexed with any nominal outside the governing category. The null pronoun in (27c) must be coindexed with the topic, as has been pointed out in the trace analysis by Huang (1984). Thus, this null pronoun behaves syntactically much like a resumptive pronoun in (27b).

[9] Treating the so-called traces as null resumptive pronouns, we actually eliminated the substitution- type topic.

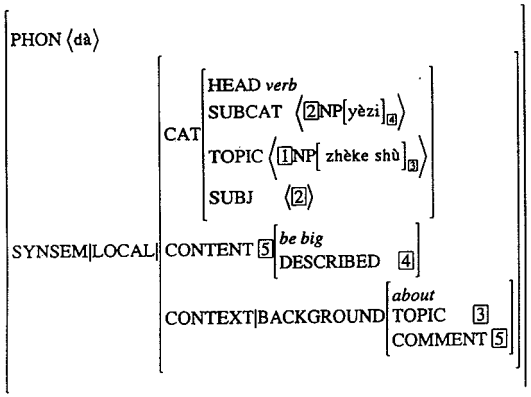
c'



At the beginning of this chapter, we introduced the concept of topic with some illustrative examples. We repeat the first one as (28d) and show the structure of its head verb as (28d') below.

(28) d. Zhè-kě shù yèzi hěn dà.
this-CL tree leaf very big
'This tree has very big leaves.'

d'.



As we can see from the anaysis of the examples above, we treat the topic as a linguistic element that is added to the left of a subject saturated VP. As will be shown in the next chapter, this treatment is useful for the various other topic structures.

2.2. The Relations between Topic and Other Parts of the Sentence

As has been shown in Jiang (1992), Chinese topic-comment structure can bear different forms. First, there are topic-comment structures that show no syntactic dependencies between the topic and the comment. This is what has been known as the typical Chinese style topic. This is shown as (17), (18), and (27a). Then there are topic-comment stuctures where the interpretation of some part in the comment is dependent on the topic. There are two kinds of topic dependencies. The first is an empty category or a resumptive pronoun that is co-indexed with the topic, known as the topicalized topic or the left dislocational topic. The second kind are those discussed in Gao 1994 where a pro' in the comment clause is coindexed with an N' in the topic. I have discussed the structure of the Chinese style topic and its analysis in the previous section. This section will be devoted to the two kinds of topic dependency structures and their analysis.

2.2.1. Topic Dependencies

I have suggested that in Chinese, topic should be treated as base-generated to the left of the subject by a topic-comment structure schema. However, questions may be raised on how topic dependency sentences should be analyzed in this approach. In a transformational analysis, topic dependencies are handled via topicalization, a movement of a constituent from within the sentence and to the left periphery of the sentence. In his works (Huang 1982, 1984), Huang notes the following Chinese sentences.

(29) a. Píngguǒ, Zhāngsān mǎi-le
apple Zhangsan buy-PER
'Zhangsan has bought the apples.'

b. Zhāngsān mǎi-le píngguǒ,
fruit Zhangsan buy-PER
'Zhangsan has bought some apples.'

(30) a. Miàntiáo, Zhāngsān chī-le.
noodles Zhangsan eat-PER
'Zhangsan has eaten the noodles.'

b. Zhāngsān chī-le miàntiáo,
Zhangsan eat-PER noodles
'Zhangsan has eaten some noodles.'

The pattern in the above sentences show that *píngguǒ* 'apple' and *miàntiáo* 'noodle' can occur both in post-verbal object position and sentence-initial topic position with only slight semantic variations: in the topic position we have a definite interpretation of the NP and in object position we have an indefinite interpretation. Since Chinese is a SVO language, as contrasted to an OSV language, the pattern can be analyzed as topicalization on a par with

WH-movement in English. That is, *píngguǒ* 'apples' and *miàntiáo* 'noodles' are base-generated postverbally and then have the option of being moved to the sentence-initial position. However, Xu and Langendoen (1985) note the following sentences to challenge Huang's topicalization analysis.

(31) Píngguǒ, Zhāngsān mǎi-le wǔ-gè.
apple Zhangsan buy-PER five-CL
'As for apples, Zhangsan has bought five of them.'

(32) Miàntiáo, Zhāngsān chī-le sān-dàwǎn.
noodles Zhangsan eat-PER three-big-bowl
'As for noodles, Zhangsan has eaten three large bowls of them.'

In these example, as Xu and Langendoen note, there is no empty position available after the verb and therefore a topicalization analysis is not possible. They propose that the topic in these sentences needs to be base-generated and there is a relatedness principle to link the topic and some constituent in the comment clause: if one of a certain set of semantic relations holds, the sentence is acceptable, and otherwise, the sentence will be ruled out as ungrammatical. However, Xu and Langendoen fail to note that even in these sentences there is a dependency relation between the topic and the post-verbal constituent. The following examples show this.

(33) a. Miàntiáo, ta chī-le sān-dàwǎn/ *sān-dàkuài/ *sān-xiǎoqún
noodle he eat-PER three-big-bowl/ three-big-piece three-small-group
'As for the noodles, he has eaten three large bowls of them.'

b. Ta chī-le sān-dàwǎn/ *sān-dàkuài/ *sān-xiǎoqún miàntiáo.
he eat-PER three-big-bowl/ three-big-piece three-small-group noodle
'As for the noodles, he has eaten three large bowls of them.'

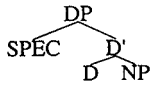
(34) a. Níqiū, wǒ zhuā-le wǔshi-tiáo/ *wǔshi-jiàn/ *wǔshi-bù
loach I catch-PER fifty-CL fifty-CL fifty-CL
'As for loaches, I caught fifty of them.'

b. Wǒ zhuā-le wǔshi-tiáo/ *wǔshi-jiàn/ *wǔshi-bù níqiū.
I catch-PER fifty-CL fifty-CL fifty-CL loach
'As for loaches, I caught fifty of them.'

As noted in Gao (1994), if we assume the DP Hypothesis (Abney 1987, Tang 1990), topicalization may still be available to analyze the above sentences.

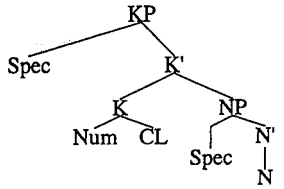
According to the DP Hypothesis, determiners are no longer treated as the specifier of a nominal phrase (NP). Instead, they are the head of what has been known as a determiner phrase (DP) that subcategorizes for a complement NP, forming the following configuration.

(35)



The Chinese version of the DP, according to Tang (1990), is a classifier phrase (KP). That is, a classifier in Chinese is a Level Two head in the nominal projection (Grimshaw 1991) and it subcategorizes for an NP. This is shown as (36).

(36) Tang's KP structure



Under this hypothesis, the dependency in (33) and (34) can be explained: the movement only involves the NP, which is the complement of the classifier. However, as is pointed out in Gao (1994), the DP analysis faces some fatal difficulties from the following examples.

(37) Wǔ-gè píngguǒ, Zhāngsān chī-le sān-gè.
five-CL apple Zhangsan eat-PER three-CL
'Of the five apples, Zhangsan ate three of them.'

(38) Shí-běn zázhì, Mǎlì jièzǒu-le bā-běn.
ten-CL magazine Mary borrow-go-PER eight-CL
'Mary has borrowed eight of the ten magazines.'

In the above examples, the constituent in the topic position is a full DP (KP according to Tang 1990), but the empty category in the comment clause is only an NP. The incompatibility of the categories between the antecedent and trace proves fatal for the topicalization analysis of Chinese topic structures.

A somewhat different analysis of Chinese topic structure that might be suggested is to treat Chinese classifiers as having a secondary function of (resumptive) pronouns. This proposal links the type of sentences like (31) and (32) to the type in (10). Thus, for (31), we assume the left dislocation analysis: *píngguǒ* 'apple' is base-generated in the topic position but is coindexed with the classifier *wǔ-gè* 'five' by whatever principle is used to coindex *Zhāngsān* with the resumptive pronoun *tā* in (10). If we assume that there is a phonologically null resumptive pronoun, sentence (9) can have the same analysis as (10).

However, there are several objections to the resumptive pronoun analysis of the classifiers. First, unlike the resumptive pronoun *tā* in (10), the classifier *wǔ-gè* 'five' in (31) does not have the same semantic denotation as the topic phrase *píngguǒ* 'apple'. For one thing, in (31) the topic phrase *píngguǒ* 'apple' is generic while the postverbal classifier *wǔ-gè* five can only have an existential interpretation. The difference between the two readings is also shown in (38), which presents another difficulty for the resumptive

pronoun analysis of classifiers, unless some principle can be developed to coindex the postverbal classifier only with the NP in the topic constituent, (which, again, leads back to the first objection).

The third objection comes from a cross-linguistic consideration. Generally, pronouns in natural languages are considered to be a closed category. That is, the number of pronouns in a language is stable and constant. If we treat Chinese classifiers as pronouns, then, this category becomes an open category. In Chinese, there are two kinds of classifiers (Gao 1994), one being permanent and the other being temporary. By permanent classifiers I mean those that function only as classifiers. Chinese has a certain number of permanent classifiers and they do not pose any problem for the classifier-as-pronoun analysis. The problem comes from the temporary classifiers, which are derived from nouns. Since there is a virtually unlimited number of nouns in Chinese, under the classifier-as-pronoun analysis, there can be an unlimited number of pronouns. This is really a very uncommon phenomenon in languages in general.

The fourth objection comes from other categories that can behave like classifiers in the topic structure. One such category is adjective phrases. The following examples illustrate the phenomenon.

(39) a. Píngguǒ, Zhāngsān zhǐ xǐhuān chī tián-de.
apple Zhangsan only like eat sweat-DE
'As for apples, Zhangsan only likes (to eat) sweat ones'

b. Zhāngsān zhǐ xǐhuān chī tián-de píngguǒ.
Zhangsan only like eat sweat-DE apple
'Zhangsan only likes (to eat) sweat apples'

(40) a. Miàntiáo, Zhāngsān zuì ài mǎi xì-de.
noodles Zhangsan most love buy thin-DE
'As for noodles, Zhangsan always prefers to buy fine ones.'

b. Zhāngsān zuì ài mǎi xì-de miàntiáo.
Zhangsan most love buy thin-DE noodles
'Zhangsan always prefers to buy fine noodles.'

Thus, if we assume the classifier-as-pronoun analysis, we may also want to treat adjective phrases in (39a) and (40a) in the same way. Then what about classifier and adjective combinations, as shown in the following:

(41) a. Píngguǒ, Zhāngsān mǎi-le wǔ-gè hóng-de.
apple Zhangsan buy-PER five-CL red-DE
'As for apples, Zhangsan has bought five red ones.'

b. Zhāngsān mǎi-le wǔ-gè hóng-de píngguǒ.
Zhangsan buy-PER five-CL red-DE apple
'Zhangsan has bought five red apples.'

(42) a. Miàntiáo, Zhāngsān chī-le sān-wǎn xì-de.
noodles Zhangsan eat-PER three-bowl thin-DE
'As for noodles, Zhangsan has eaten three bowls of thin ones.'

b. Zhāngsān chī-le sān-wǎn xì-de miàntiáo.
Zhangsan eat-PER three-bowl thin-DE noodles
'Zhangsan has eaten three bowls of thin noodles.'

Still more devastating examples are the following, where the postverbal elements may be relative clauses, relative clauses plus classifier phrases, relative clauses plus adjective phrases, and even combinations of all three.

(43) a. Qìchē, Zhāngsān xǐhuān rìběn zhìzào de.
car Zhangsan like Japan make DE
'As for cars, Zhangsan likes those made in Japan.'

b. Zhāngsān xǐhuān rìběn zhìzào de qìchē,
Zhangsan like Japan make DE car
'Zhangsan likes cars that are made in Japan.'

(44) a. Qìchē, Zhāngsān xǐhuān nǐ zuótiān mǎi de nèi liàng.
car Zhangsan like you yesterday buy DE that CL
'As for cars, Zhangsan likes the one you bought yesterday.'

b. Zhāngsān xǐhuān nǐ zuótiān mǎi de nèi liàng qìchē.
Zhangsan like you yesterday buy DE that CL car
'Zhangsan likes the car you bought yesterday.'

(45) a. Píngguǒ, Zhāngsān xǐhuān nǐ gāng cóng shùshang zhāi-xiàlai de nèi wǔ-gè dà-de.
apple Zhangsan like you just buy tree-top pick-down DE that five-CL big-DE
'As for apples, Zhangsan likes the five big ones you just picked from the tree.'

b. Zhāngsān xǐhuān nǐ gāng cóng shùshang zhāi-xiàlai de nèi wǔ-gè dà-de píngguǒ.
Zhangsan like you just from tree-top pick-down DE that five-CL big-DE apple
'Zhangsan likes the five big apples you just picked from the tree.'

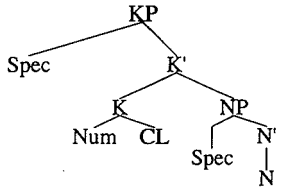
Thus, these objections show that classifier-as-pronoun analysis is not theoretically and empirically sound.

2.2.2. Agreement in Nominal Phrases

We have shown that Chinese topic structures can take different forms and that a topicalization analysis cannot capture all the facts, nor can the DP analysis. Indeed, in Gao 1994, we have critically examined the DP Hypothesis with special application to Chinese (Tang 1990) and pointed out that the DP analysis faces some serious difficulties, both empirically and theoretically, in the analysis of Chinese nominal phrases. For one thing, under the DP analysis, it seems very difficult to explain the agreement between the classifier and the head noun. Tang argues that in Chinese the classifier functions as the

head of a classifier phrase (KP) and subcategorizes for a nominal phrase, shown as (36) and repeated below. Under this analysis, classifier-noun agreement in Chinese, shown in (46) and (47) would have to be treated as head-complement agreement.

(36) Tang's KP structure

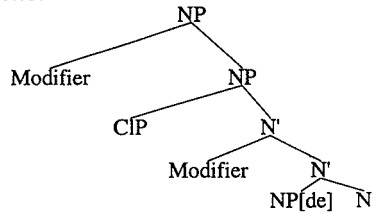


(46) wǔ-tiáo/ *wǔ-tuán/ *wǔ-jiàn/ *wǔ-zhāng/ *wǔ-míng/ níqiū
five-CL five-CL five-CL five-CL five-CL loach
'five loaches'

(47) wǔ-tiáo níqiū/ *yǐzi/ *píngguǒ/ *shuǐniú/ *xuéshēng
five-CL loach chair apple water-buffalo student
'five loaches'

But in natural languages this kind of agreement is far less common than head-specifier agreement. Thus a different analysis is offered along the lines of the more commonly assumed NP structure for Chinese nominal phrases, shown as (48).

(48) Gao's NP structure



In (48) the classifier projects to a classifier phrase (ClP) and it is treated as the specifier of an NP. This analysis treats the agreement between classifier and the head noun in Chinese as specifier-head agreement, which is commonly found in natural languages. This agreement is captured through the head feature SPEC on the head classifier. This is shown in (49) with the example of *wǔ-tiáo* 'five-CL' in (46) and (47).

(49)

$$\begin{bmatrix} \text{PHON} \langle \text{wǔ - tiáo} \rangle \\ \text{SYNSEM|LOC|CAT|HEAD} \begin{bmatrix} \text{SPEC N'} \begin{bmatrix} \text{NUM plural, SHAPE tiao} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The lexical specification in (49) can correctly describe the behavior of *wǔ-tiáo* 'five-CL' in (46) and (47): níqiū 'loach' in Chinese is considered as an object that must be classified as *tiáo*.

Other prenominals, except NP[*de*], which is treated as a complement of the head noun (Gao 1994), are considered to be adjunct modifiers that can modify either NP or N'. These modifiers include relative clauses, genitive phrases, measure phrases, and adjective phrases. However, there does not seem to exist any morphologically marked agreement between the modifiers and the head noun.

2.2.3. The Properties of Topic-Dependent Empty Category

Having reviewed the internal structure of Chinese nominal phrases, I now return to the topic dependency problem. Let's again look at some of the sentences below.

(50) Níqiū, wǒ zhuā-le wǔ-tiáo/ *wǔ-tuán/ *wǔ-jiàn/ *wǔ-zhāng/ *wǔ-míng
loach I catch-PER five-CL five-CL five-CL five-CL five-CL
'As for loaches, I have caught five of them'

(51) Níqiū/ *yǐzi/ *píngguǒ/ *shuǐniú/ *xuéshēng, wǒ kànjiàn-le wǔ-tiáo
loach chair apple water-buffalo student I see-PER five-CL
'As for loaches, I have seen five of them'

These sentences resemble the examples in (46) and (47) in that the agreement between the topic and the postverbal classifier phrase is the same as the specifier-noun agreement in (46) and (47). Since the topic is argued to be base-generated in Chinese, a DP-style topicalization analysis is not available here. The classifier-as-pronoun analysis has been shown to be inappropriate and inadequate. An alternative is to propose a base-generated empty category in the post-ClP position that is coindexed with the topic so that the postverbal classifier can agree with it.

In HPSG, coindexing means structure-sharing of the index, where all agreement features are located, including the classifier-noun agreement feature SHAPE. When the empty category in the post-ClP position is coindexed with the antecedent, it shares information with the antecedent, including the agreement features. So for instance, when the empty category after *wǔ-tiáo* in (50) is coindexed with *níqiū* 'loach', it shares, among others, the feature SHAPE that has the value *tiáo* and the feature SPEC that is looking for a specifier that specifies its head to have *tiáo* as its SHAPE value. Thus only *wǔ-tiáo* can satisfy all the agreement requirements in (50).

Our proposed empty category in post-ClP position differs from the (overt or null) resumptive pronouns in examples like (27b-c). First, the latter are full phrases (maximal projections), but we suggest that the empty category should be something less than a

maximal phrase, more specifically, an N'. And second, I propose that the post-ClP empty category has the same categorial status with the head N' of the phrase in the topic position and is coindexed with the N' in the topic phrase. Thus, following Gao's Chinese NP structure, the topic structures can have the following analysis.

(52) [[Píngguǒ$_i$]$_{N'}$]$_{NP}$, wǒ bú ài chī [suān-de [e$_i$]$_{N'}$]$_{NP}$.
apple I not love eat sour
'As for apples, I don't like (to eat) sour ones.'

(53) [[Píngguǒ$_i$]$_{N'}$]$_{NP}$, Zhāngsān názǒu-le [sān-gè [e$_i$]$_{N'}$]$_{NP}$.
apple Zhangsan take-away-PER three-CL
'As for the apples, Zhangsan took away five of them.'

(54) [Wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$, Zhāngsān názǒu-le [sān-gè [e$_i$]$_{N'}$]$_{NP}$.
five-CL apple Zhangsan take-away-PER three-CL
'As for the five apples, Zhangsan took away five of them.'

(55) [[Píngguǒ$_i$]$_{N'}$]$_{NP}$, tā zhǐ yào [nǐ gāng cóng shùshang zhāi-xiàlái de
apple he only want you just from tree-top pick-down DE
[nèi jǐ-gè [hóng-de [e$_i$]$_{N'}$]$_{NP}$]$_{NP}$.
that several-CL red
'As for the apples, he only wants those red ones that you have just picked from the trees.'

Under this analysis, the unacceptability of some of the following expressions in (56) is seen in terms of violations of the specifier-head agreement (Cf (56b,d)) in Chinese. Since there is no agreement between the head noun and its adjunct modifiers in Chinese, the gramaticality of all the expressions in (57) and (58) is predicted.

(56) a. [[*Píngguǒ/ *yǐzi/ *níqiū/ shuǐniú$_i$]$_{N'}$]$_{NP}$, wǒ mǎi-le [shí-tóu [e$_i$]$_{N'}$]$_{NP}$.
apple chair loach water-buffalo I buy-PER ten-CL
'As for water-buffalos, I have bought ten of them'

b. Wǒ mǎi-le [shí-tóu [*píngguǒ/ *yǐzi/ *níqiū/ shuǐniú]$_{N'}$]$_{NP}$.
I buy-PER ten-CL apple chair loach water-buffalo
'As for water-buffalos, I have bought ten of them'

c. [[Shuǐniú$_i$]$_{N'}$]$_{NP}$, wǒ mǎi-le [*shí-liàng/ *shí-jiàn/ *shízhāng shí-tóu [e$_i$]$_{N'}$]$_{NP}$.
water-buffalo I buy-PER ten-CL ten-CL ten-CL ten-CL
'As for water-buffalos, I have bought ten of them'

d. Wǒ mǎi-le [*shí-liàng/ *shí-jiàn/ *shízhāng shí-tóu [shuǐniú]$_{N'}$]$_{NP}$.
I buy-PER ten-CL ten-CL ten-CL water-buffalo
'I have bought ten water-buffalos'

(57) a. [[Píngguǒ/ yǐzi/ níqiū/ shuǐniú$_i$]$_{N'}$]$_{NP}$, wǒ xǐhuān [[ní mǎi de [e$_i$]$_{N'}$]$_{N'}$]$_{NP}$.
apple chair loach water-buffalo I like you buy DE
'As for apples/chairs/loaches/water-buffalos, I like the ones you bought.'

b. Wǒ xǐhuān [ní mǎi de [[píngguǒ/ yǐzi/ níqiū/ shuǐniú]$_{N'}$]$_{N'}$]$_{NP}$.
I like you buy DE apple chair loach water-buffalo
'I like the apples/chairs/loaches/water buffalos that you bought.'

(58) a. [[Píngguǒ/ yǐzi/ níqiū/ shuǐniú$_i$]$_{N'}$]$_{NP}$, wǒ xǐhuān [[xiǎo-de [e$_i$]$_{N'}$]$_{N'}$]$_{NP}$.
apple chair loach water-buffalo I like small
'As for apples/chairs/loaches/water-buffalos, I like the ones you bought.'

b. Wǒ xǐhuān [xiǎo-de [[píngguǒ/ yǐzi/ níqiū/ shuǐniú]$_{N'}$]$_{N'}$]$_{NP}$.
I like small apple chair loach water-buffalo
'I like small apples/chairs/loaches/water buffalos.'

In Chinese, a head noun may also be compatible with several different classifiers, depending on the point of view of the speaker. Since the proposed analysis treats the topic and postverbal empty category as having separate base-generated heads, different classifiers are allowed for each head as long as the classifiers are compatible with the head. This is shown in the following.

(59) [Měi jīn/ *měi běn [píngguǒ$_i$]$_{N'}$]$_{NP}$, tā dōu yào shǎo gěi [yí-gè/
every CL every CL apple he all want less give one-CL
*yī-jiàn [e$_i$]$_{N'}$]$_{NP}$.
one-CL
'There is one apple less in every pound of apples he sells.'

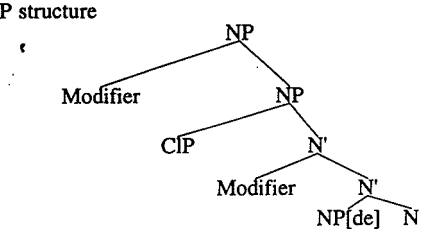
(60) [Yì-dàqún/ *yí-dàduì [shuǐniú$_i$]$_{N'}$]$_{NP}$, tā zhǐ mǎi-zǒu-le [sì-tóu/
every CL every CL water-buffalo he only buy-go-PER four-CL
*sì-liǎng [e$_i$]$_{N'}$]$_{NP}$.
one-CL
'Of the big herd of water buffalos, he only bought four of them.'

2.2.4. The Syntactic Status of the EC

In the previous discussion, we have suggested that the empty category should not be treated as a full phrase, but the head of the phrase, so that the dependencies between the topic and some element in the comment can be explained. This means that there are two possibilities for the non-maximal projection, a pure lexical category or an X-bar level category. Here we want to show that the EC is not a lexical category.

When determining that the EC is not a full phrase, we used the NP structure given in Gao (1994), where a nominal projects to its maximal projection by combining with a specifier. In Chinese, the specifier is a classifier phrase (ClP). We repeat the structure as (61) below.

(61) Gao's NP structure



We have shown that the EC is allowed to combine with a classifier phrase, a specifier that a lexical category needs in order to project into a full phrase. Therefore it must be a projection that is less than a full phrase since a maximal projection is a specifier saturated phrase. However, in (61) there are two levels of categories below the full phrase NP, an N' and the lexical category N. An N' is a complement saturated nominal projection. So if the EC is complement saturated, it will not combine with any complement.

A complement of a noun is a phrase that the head noun subcategorizes for and it may, for instance, bear the relation of *about* with the head (Pollard and Sag 1992, Gao 1994). Thus in the phrase *yī-běn yǔyánxué-de shū* 'a book about linguistics', *yǔyánxué* 'linguistics' is the complement of the head noun *shū* 'book'. Likewise, in the ambiguous phrase *Lǐsī-de gùshi* 'Lisi's story' or 'the story about Lisi', only when Lisi is the content of the story can it be the complement of the head noun *gùshi* 'story'. The possessive use of Lisi only makes it an adjuct modifier for the head noun. Now examine the following.

(62) a. Shí-běn shū, Mǎlì jièzǒu-le bā-běn hòu de.
ten-CL book Mary borrow-go-PER eight-CL thick DE
'Of the ten books, Mary has borrowed (away) eight thick ones.'

b. *Shí-běn shū, Mǎlì jièzǒu-le bā-běn yǔyánxúe de.
ten-CL book Mary borrow-go-PER eight-CL linguistics DE
'*Of the ten books, Mary has borrowed (away) eight liguistics ones.'

(63) Nèixie gùshi, Mǎlì zhí xǐhuān Lǐsī de.
those story Mary only like Lisi DE
a. 'Of those strories, Mary only likes Lisi's.'
b. '*Of those stories, Mary only likes the ones about Lisi.'

In (62), the EC is allowed to combine with *hòu de* 'thick', an adjunct modifier, in (a), but it is not allowed to combine with *yǔyánxué de* 'about linguistics', a complement, in (b).[10] This is because the EC is already complement saturated. The same is true of (63). The ambiguous expression *Lǐsī-de gùshi* 'Lisi's story' or 'the story about Lisi' is no longer ambiguous because the complement-head version of expression is replaced as a whole by the EC. Thus we conclude the discussion with the claim that the EC is an intermediate projection, syntactically equivalent to the English pronominal *one*. We will name this X-Bar level pronominal *pro'*.

2.2.5. Other Occurrences of *pro'*

I have argued that the topic dependent postverbal *pro'* should be best analyzed as base-generated and coindexed with the head of the topic. It might be thought that the *pro'* is only an N' version of the null resumptive pronoun, especially when we look at examples where

[10] See Gao (1994) for detailed arguments for the analysis of nominal phrases in Chinese.

a topic-pro' coindexing is possible whenever topic-resumptive pronoun coindexing is found. We have already seen examples where either pro' or a resumptive pronoun in the postverbal object position is related to the topic. The following show that pro' in the marked complements in the (b) examples can also be dependent with the topic, just as resumptive pronouns are in the (a) examples below.

(64) a. Píngguǒ$_i$, Zhāngsān bǎ tamen$_i$ názǒu-le.
apple Zhangsan BA they take-go-PER
'As for the apples, Zhangsan has taken them away.'

b. [[Píngguǒ$_i$]$_{N'}$]$_{NP}$, Zhāngsān bǎ [sān-gè/ *sān-jiàn [pro'$_i$]$_{N'}$]$_{NP}$ názǒu-le.
apple Zhangsan BA three-CL three-CL take-go-PER
'As for the apples, Zhangsan has taken away three of them.'

c. [Wǔ-gè/ *wǔ-jiàn [píngguǒ$_i$]$_{N'}$]$_{NP}$ Zhāngsān bǎ [sān-gè/ *sān-běn
five-CL five-CL apple Zhangsan BA three-CL three-CL
[pro'$_i$]$_{N'}$]$_{NP}$ názǒu-le.
take-go-PER
'As for the five apples, Zhangsan has taken three of them away.'

d. [yí-kuān/ *yí-qún [píngguǒ$_i$]$_{N'}$]$_{NP}$ Zhāngsān bǎ [sān-gè/ *sān-tiáo [pro'$_i$]$_{N'}$]$_{NP}$
one-CL one-CL apple Zhangsan BA three-CL three-CL
názǒu-le.
take-go-PER
'As for the basketful of apples, Zhangsan has taken three of them away.'

(65) a Nèi-bǎ càidāo$_i$, Zhāngsān yòng tā$_i$ qiē-guo ròu.
that-CL vegetable-knife Zhangsan use it chop-PAST meat
'As for the kitchen knive, Zhangsan chopped meat with it.'

b [Liǎng-bǎ/ *liǎng-tiáo [càidāo$_i$]$_{N'}$]$_{NP}$, Zhāngsān yòng [yí-bǎ/ *yí-jiàn
two-CL two-CL vegetable-knife Zhangsan use one-CL one-CL
[pro'$_i$]$_{N'}$]$_{NP}$ qiē ròu, yòng lìng [yí-bǎ/ *yí-běn [pro'$_i$]$_{N'}$]$_{NP}$ qiē cài.
chop meat use another one-CL one-CL chop vegetable
'As for the two kitchen knives, Zhangsan chops meat with one and chops vegetables with the other.'

(66) a. Yǒngfēng Zhōngxue$_i$, wǒ zài nèier$_i$ dú-guo gāozhōng.
Yongfeng middle-school I ZAI there read-PAST high-middle(school)
'As for Yongfeng Middle School, I went to high school there.'

b. [Wǔ-jia [cānguǎn$_i$]$_{N'}$]$_{NP}$, tā zài [sān-jia [pro'$_i$]$_{N'}$]$_{NP}$ dāng-guo jīnglǐ.
five-CL restaurant he ZAI three-CL serve-as-PAST manager
'As for the five restaurants, he served as the manager in three of them.

(67) a. Nèi-ge háizi$_i$, Mǎlì gěi tā$_i$ jiāo-guo yīngyu.
that-CL child Mary GEI he teach-PAST English
'As for the child, Mary taught him English.'

b. [Shí-ge [háizi$_i$]$_{N'}$]$_{NP}$, Mǎlì gěi [liù-ge [pro'$_i$]$_{N'}$]$_{NP}$ jiāo-guo yīngyu.
ten-CL child Mary GEI six-CL teach-PAST English
'As for the ten children, Mary taught English to six of them.'

We also see from the following examples that the pro' in the subject position can be dependent on the topic, as compared to the (a) example where conidexing of the resumptive pronoun in the subject position with the topic is also required.

(68) a. Nèi-ge háizi$_i$, tā$_i$ hái bú huì shuō yīngyu.
that-CL child he yet not able say English
'As for the child, he cannot speak English yet.'

b. [Shí-ge [háizi$_i$]$_{N'}$]$_{NP}$, zhíyou [sān-ge [pro'$_i$]$_{N'}$]$_{NP}$ bú huì shuō yīngyu.
ten-CL child only three-CL not able say English
'As for the ten children, only three cannot speak English.'

c. [Liǎng-zhī/ *liǎng-jiàn [lǎohǔ$_i$]$_{N'}$]$_{NP}$, [yī-zhī/ *yī-fí [pro'$_i$]$_{N'}$]$_{NP}$ méiyǒu
two-CL two-CL tiger one-CL one-CL not-have
wěiba, [yī-zhī/ *yī-běn [pro'$_i$]$_{N'}$]$_{NP}$ méiyǒu ěrduo, zhēn qíguài.
tail one-CL one-CL not-have ear really strange
'It is really strange that, of the two tigers, one does not have a tail and the other does not have ears.'

d. [Shí-běn/ *shí-jiàn [xiǎoshuō$_i$]$_{N'}$]$_{NP}$, [liáng-běn/ *liáng-fí [pro'$_i$]$_{N'}$]$_{NP}$ shì
ten-CL ten-CL novel two-CL two-CL be
mǎi de, [sān-běn/ *sān-tiáo [pro'$_i$]$_{N'}$]$_{NP}$ shì cóng túshūguǎn jiè de,
buy DE three-CL three-CL be from library borrow DE
qíyú [wǔ-běn/ *wǔ-zhāng [pro'$_i$]$_{N'}$]$_{NP}$ dōu shì péngyǒu sòng de.
the-rest five-CL five-CL all be friend give DE
'As for the ten novels, two are bought, three are borrowed from the library, and the other five are all gifts from friends.'

However, there are important differences between the two, showing that the pro' is not just an X-bar level version of the resumptive pronoun. As we can see from the following examples, pro' can be coindexed with an o-comanding argument within the sentence while resumptive pronouns cannot.

First, we look at the well-known *bǎ*-construction in Chinese. In Chapter 3, I will argue that the word *bǎ* is actually a marker marking the thematic role of the following nominal phrase. Thus the *bǎ*-phrase needs to be treated as a marked complement of the head verb. Since a marked complement is argued to be less patient-like than the unmarked complement (the object) and a less patient-like argument in a hierarchical argument structure, which is presented in the next chapter, generally corresponds to a less oblique argument in the sentence, the *bǎ*-phrase thus can o-bind the pro' in the object position. But this binding relation cannot hold between the resumptive pronoun and the *bǎ*-phrase. The following examples show this difference.

(69) a. *Zhāngsān bǎ nèi-ge píngguǒ$_i$ názǒu-le tā$_i$.
Zhangsan BA that-CL apple take-go-PER it

b. Zhāngsān bǎ [[píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè/ *sān-jiàn [pro'$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA apple take-go-PER three-CL three-CL
'Zhangsan has taken away three of the apples.'

c. Zhāngsān bǎ [wǔ-gè/ *wǔ-jiàn [píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè/
Zhangsan BA five-CL five-CL apple take-go-PER three-CL
*sān-běn [pro'$_i$]$_{N'}$]$_{NP}$.
three-CL
'Zhangsan has taken away three of the five apples.'

d. Zhāngsān bǎ [yī-kuān/ *yī-qún [píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè/
Zhangsan BA one-CL one-CL apple take-go-PER three-CL
*sān-tiáo [pro'$_i$]$_{N'}$]$_{NP}$.
three-CL
'Zhangsan has taken away five of the basketful of apples.'

In (69) we see that in each sentence there is a dependent category in the object position, which is the most oblique argument of the sentence. In each example, there is also a *bǎ*-phrase, which is less oblique than the object. According to the binding principle adopted in this thesis, the dependent category is required to be bound by the *bǎ*-phrase and we see in (69) that only pro' obey this principle, not the resumptive pronoun.[11]

[11] Actually the binding of pro' seems to be very restricted in that it must be bound by the next less oblique specifier-unsaturated argument if there is one. This point can be seen in the explanation of the following unacceptable sentences raised by Peter Culicover (personal communication).

(i) A: Wǒ bǎ wǔ-tiao yú fàngzài-le sì-zhang zhuōzi-shang.
I BA five-CL fish place-at-PER four-CL table-top
'I have put five fish on four tables.'

B: *Zhuōzi$_i$, wǒ bǎ sì-tiao [pro'] fàngzài-le wǔ-zhang [pro'$_i$]shang.
table I BA four-CL place-at-PER five-CL -top
Intended: 'As for tables, I have put four (fish) on five.'

So far as I can see, there are at least two problems for (iB). First, the pro' in the *bǎ*-phrase is not (properly) bound because *bǎ*-phrase is a marked complement and the pro' in it needs to be bound by a less oblique specifier-unsaturated argument. In our case, there isn't any. Thus, the topic must serve as the binder. But the topic cannot serve as the antecedent because there is an agreement incompatibility between the topic phrase *zhuōzi* 'table', which has the agreement feature set to *zhang*, and the classifier *sì-tiao* 'four (fish)', which has the agreement feature *tiao*. If this agreement is satisfied, the sentence can be acceptable, as is the case in (ii).

(ii) A: Yú$_i$, wǒ bǎ sì-tiao [pro'$_i$] fàngzài-le wǔ-zhang zhuōzi-shang.
fish I BA four-CL place-at-PER five-CL table-top
'As for the fish, I have put four on five tables.'

The second problem for (iB) is that the pro' in the object position may not be properly bound, either. Object in Chinese is said to be the most oblique argument of the sentence and the pro' in it must be bound by the next less oblique argument, which, in our case, is the *bǎ*-phrase. However, the *bǎ*-phrase has the agreement feature set to *tiao*, which is not compatible with the object agreement feature *zhang*. This is further illustrated in the following.

(iii) *Zhuōzi$_i$, wǒ bǎ sì-tiao yú fàngzài-le wǔ-zhang [pro'$_i$]-shang.
table I BA four-CL fish place-at-PER five-CL -top
Intended: 'As for the tables, I have put four fish on five.'

Again, if the agreement between the object and the *bǎ*-phrase is made compatible, the sentences will be acceptable. This is shown in the following.

(iv) Wǒ bǎ sì-zhang zhuōzi$_i$ fàngzài-le wǔ-zhang [pro'$_i$]-shang.

Secondly, subject is argued to be less oblique than the marked and unmarked complement of the sentence and therefore, it can o-bind a pro' in the object if no marked complement intervenes. The following show this phenomenon. Note that in the (a) example, the resumptive pronoun cannot be coindexed with the subject.

(70) a. *Nèi-ge píngguǒ$_i$ làn-le tā$_i$.
that-CL apple rot-PER it

b. [Sì-ge/ *sì-jiàn [píngguǒ$_i$]$_{N'}$]$_{NP}$ làn-le [sān-ge/ *sān-li [pro'$_i$]$_{N'}$]$_{NP}$
four-CL four-CL apple rot-PER three-CL three-CL
'Three of the four apples become bad.'

c. [Shí-ke/ *shí-jiàn [shù$_i$]$_{N'}$]$_{NP}$ zhǐ huó-le [sān-ke/ *sān-li [pro'$_i$]$_{N'}$]$_{NP}$
ten-CL ten-CL tree only live-PER three-CL three-CL
'Only three of the ten trees have survived.'

Thus we conclude that the pro' is not an X-bar level resumptive pronoun. It seems to be a semantic analog to the English pronoun *one*, as discussed in Jackendoff 1987.[12]

2.2.6. Other Relations

Now let's look again at the first Chinese sentence we started this chapter with. We repeat the sentence below.

(3) Zhè-kě shù yèzi hěn dà.
this-CL tree leaf very big
'This tree has very big leaves.'

We have suggested that (3) should be analyzed as an addition-type topicalization, shown in (28b), where the nominal phrase *zhè-kě shù* 'this tree' is an added argument to the sentence *yèzi hěn dà* 'leaf is very big' and there is an *aboutness* relation between the topic and the comment sentence that makes this addition possible. Thus when we talk about the fact that the leaves are very big, we mean the leaves of the tree. However, the relation between the subject *yèzi* and the topic *zhè-kě shù* has been argued to be a semantic one, rather than just a pragmatic one. This relation is known as the whole-part relation. That is,

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I BA four-CL table place-at-PER five-CL -top
'I have put four tables on top of (the other) five.'

(v) Zhuōzi$_i$, wǒ bǎ sì-zhang [e$_i$] fàngzài-le wǔ-zhang [e$_i$]-shang.
table I BA four-CL place-at-PER five-CL -top
'As for the tables, I have put four on top of five.'

12 However, difference does seem to exist. For one thing, the pro' can always be A-bound, as will be discussed later in the chapter, But the English 'one' is not always fully acceptable when it is A-bound. The following example shows this.

(i) ?Our party is a great one.

the leaves are intended to be a part of the tree. Without this relation, the sentence is not acceptable. Examine the following.

(71) a. Zhè-kě shù$_i$, tā$_{i/*j}$ de yèzi hěn dà.
this-CL tree it DE leaf very big
'As for this tree, its leaves are very big.'

b. *Zhè-kě shù, kuíhuā de yèzi hěn dà.
this-CL tree sunflower DE leaf very big

c. *Zhè-kuài shítou, yèzi hěn dà.
this-CL rock leaf very big

In (71a), the leaves must belong to the tree. The unacceptability of (71b) and (71c) shows that this relation cannot be made invalid. To capture this relation, Li (1985) suggests that there is a null possessive pronoun within the phrase that denotes the part. In our case, it is within the the nominal phrase *yèzi*. This pronoun, according to Li, is bound by the phrase that denotes the whole. In our case, it is coindexed with the topic phrase *zhè-kě shù*. However, Li does not show how this pronoun must be A'-bound since in her framework, a pronoun is only said to be A-free. That is, the pronoun is required to have disjoint reference with a c-commanding argument NP. Therefore it can be bound by any non-argument NP outside the governing category and the topic is only one of them. Thus Li's analysis does not guarantee the fact that in (3) the topic must be the only antecedent for the pronoun. In our analysis, we adopt Li's suggestion that the null possessive must be coindexed with the topic. But we suggest that this null possessive must either be a resumptive pronoun or a pro'. The suggestion that the null possessive can be a null resumptive pronoun is evidenced by the fact that a lexical resumptive pronoun is possible in the nominal phrase, as is shown in (71a). Thus the interpretation of (3) is guaranteed. In (71b) the possessive position is filled with a lexical item and the whole-part relation between the topic and the subject is blocked, hence the unacceptability. In (71c), since the null possessive is coindexed with an antecedent that is not compatible with the object expected to have leaves, the sentence is not well received.

We can see that the null resumptive pronoun functions just like the lexical resumptive pronoun. The difference is that in overt expressions a possessive is a resumptive attached with the possessive marker *de* while this possessive marker is not there with the null possessive. Our explanation for this is that a possessive marker is generally treated as a syntactic affix and it must be attached to a lexical item that denotes the possessor. Since a null resumptive is a phonologically null element, the possessive marker has no lexical host and therefore is phonologically unrealized as well.

The null possessive can be a pro' as well. This is because in cases such as (72), we see that the possessive is a classifier phrase with no nominal head. We have argued that in cases like this, there is an EC known as the pro'. We can see that the marker *de* shows up when pro' combines with a lexical specifer to form a full phrase.

(72) [Nèi wǔ-ming [zuìfà$_i$]$_{N'}$]$_{NP}$, fǎyuàn bóduǒ-le [sān-ming [pro'$_i$]$_{N'}$]$_{NP}$
that five-CL criminal court deprive-PER three-CL
de zhèngzhìquánlì.
DE political-right
'As for the five criminals, the court dreprived three of their political rights.'

As (72) shows, within the possessive phrase *sān-ming de* 'three (ciminals)'s' there is a pro' that is coindexed with the head of the topic. Because of the coindexing, the semantic interpretation is guaranteed.

Xu and Langendon's examples are repeated below.

(11) Shuǐguǒ, Zhāngsān zuì xǐhuān mǎi píngguǒ
fruit Zhangsan most like buy apple
'As for fruits, Zhangsan likes most to buy apples.'

(12) Yú, Zhāngsān tèbié xǐhuān chī huángyú
fish Zhangsan especially like eat yellow-fish
'As for fish, Zhangsan especially likes to eat yellow croaker.'

As we can see, the relation between the topic and the object in the above examples is not exactly a physical whole-part relation, but a category and subcategory relation. That is, *píngguǒ* 'apple' is a kind of fruit and *huángyú* 'yellow croaker' is a kind of fish. If we take this category-subcategory as a non-physical whole-part relation, the same analysis can be extended to these sentences as well.

2.3. Conclusion

In this chapter, I have argued that, in Chinese, topic structure should be analyzed as base-generated in a pre-subject position and the topic needs to be treated uniformly as an addition to the subject-saturated VP, known as the comment clause in the thesis. The addition of a topic to the comment clause is possible only when there is an *aboutness* relation between the topic and the some element in the comment clause. This aboutness relation is often realized as coindexing of the topic and some element in the comment. Two categories can figure in such a dependency: a resumptive pronoun, null or lexical, and a pro', which is argued to be an X'-level category, much like the English *one*. These two kinds of elements differ also in the respect that resumptive pronouns, being pronouns, are subject to binding principle B: they cannot be coindexed with a less oblique co-argument; but pro' can be

dependent on the topic only when there is no intervening less oblique specifier-unsaturated nominal argument between the topic and the phrase in which the pro' resides.[13]

[13] This is only a preliminary attempt, and is by no means an accurate one. I will leave the exact binding conditions of the pro' to a future research project.

Chaper 3

VALENCE ALTERNATIONS

3.0. Introduction

By valence I mean the number and kind of arguments that a verb is subcategorized for. Thus in English the verb *eat* has a valence of two in the expression *John eats bananas* and the verb *leave* has a valence of only one in the expression *John left*.

In a similar way, in Chinese the verb *chīwán* 'eat-finish' has a valence of two in the following sentence.

(1) a. Zhāngsān chīwán-le fàn.
Zhangsan eat-finish-PER meal.
'Zhangsan has finished (eating) his meal.'

However, the arrangement of the two arguments seems to be more flexible in Chinese than the English verb *eat*. Thus the same two arguments in (1a) can be rearranged to both appear in preverbal positions, as is shown in (1b).

(1) b. Zhāngsān bǎ fàn chīwán-le
Zhangsan BA meal eat-finish-PER
'Zhangsan has finished (eating) his meal.'

It is this different arrangement of the same arguments that I call valence alternation.

In the past the discussion of valence alternations in Chinese has been focused on the so called *bǎ*-and non-*bǎ*-constructions: (1a) is known as a non-*bǎ*-construction and (1b) as a typical *bǎ*-construction. Although the debate seems to be concentrated on which of the two structures should be treated as the basic (deep or underlying) structure (the other being derived structure), the treatment of the word *bǎ* also plays an unusually important role in the literature. In one point of view *bǎ* is treated as a verb (Huang 1991 treats it as a light verb; Ding 1994 treats it as a main causative verb, and Yang 1995 treats it as a regular verb) or some kind of a functional category (Zou 1994). Another point of view (Gao 1992) is that it should be treated as a preposition. And still another point of view is that *bǎ* behaves more like a marker (as a case marker in Li 1990, as a secondary topic marker in Tsao 1987 and Gao 1991, 1996).

While readers of these discussions are acquainted with how *bǎ* triggers valence alternation, they may be largely unaware of the fact that there are a number of other words that can also trigger valence alternation. The following examples are taken from Gao (1992).

(2) a. Wǒmen yào xuéxí Léi Fēng.
we must learn Lei Feng
'We must learn from Lei Feng.'

b. Wǒmen yào xiàng Léi Fēng xuéxí.
we must towards Lei Feng learn
'We must learn from Lei Feng.'

c. Wǒmen yào xiàng Léi Feng xuéxí zhùrénwéilè de jīngshén.
we must towards Lei Feng learn help-people-as-pleasure DE spirit
'We must learn from Lei Feng the spirit of helping people as a pleasure.'

(3) a. Lìsì qù-le Běijīng.
Lisi go-PER Beijing
'Lisi went to Beijing.'

b. Lìsì wǎng Běijīng qù-le.
Lisi toward Beijing go-PER
'Lisi went to Beijing.'

c. Lìsì wǎng Běijīng dǎ-le yí-ge diànhuà.
Lisi toward Beijing make-PER one-CL telephone
'Lisi made a telephone call to Beijing.'

(4) a. Zhāngsān hěn mǎnyì zhè jian shì.
Zhangsan very satisfy this CL matter
'Zhangsan is satisfied with this matter.'

b. Zhāngsān duì zhè jian shì hěn mǎnyì.
Zhangsan concerning this CL matter very satisfy
'Zhangsan is very satisfied with this matter.'

c. Zhāngsān duì wǒ fā-guo shì.
Zhangsan toward I make-EXP pledge
'Zhangsan made a pledge to me.'

(5) a. Mǎlì lái-guo měiguó.
Mary come-EXP U.S.A.
'Mary has been to the United States.'

b. Mǎlì dào měiguó lái-guo.
Mary arriving U.S.A. come-EXP
'Mary has been to the United States.'

c. Mǎlì dào měiguó xué-guo yǔyánxué.
Mary arriving-at U.S.A. study-EXP linguistics
'Mary has been to the United States to study linguistics.'

(6) a. Tángmǔ zǒuchū shēn-shān-lǎo-lín lái le.
Tom walk-out deep-mountain-old-forest come LE
'Tom has walked out of the remote mountain forests.'

b. Tángmǔ cóng shēn-shān-lǎo-lín zǒuchū lái le.
Tom from deep-mountain-old-forest walk-out come LE
'Tom (finally) walked out of the remote mountain forests.'

c. Tángmǔ cóng shēn-shān-lǎo-lín bēichū yì-kuāng cǎo-yào
Tom from deep-mountain-old-forest carry-out one-basket grass-medicine
lái le.
come LE
'Tom has carried out a basket of medicinal herbs from the remote mountain forests.'

(7) a. Lisi chángchaǹg chī fànguǎn.
Lisi often eat restaurent
'Lisi often eats in restaurants.'

b. Lisi chángchaǹg zài fànguǎn chī fàn.
Lisi often at restaurent eat meal
'Lisi often eats his meals in restaurants.'

(8) a. Lisi bù huì chī kuàizi.
Lisi not know-how eat chopsticks
'Lisi does not know how to eat with chopsticks.'

b. Lisi bù huì yòng kuàizi chī fàn.
Lisi not know-how use chopsticks eat meal
'Lisi does not know how to eat (his) meals with chopsticks.'

Thus, although *bǎ* is the most frequently encountered valence alternation trigger, it is not the only one. In this chapter, we are going to have a closer look at those words and propose a uniform analysis for them. In Section 3.1, we concentrate on the word *bǎ* and propose that it be treated as a marker rather than a verb or a preposition. In Section 3.2, we take a close look at another frequently occurring word *zài* and suggest that it be treated in the same way as *bǎ*. In Section 3.3, other less frequently used words are examined. Section 3.4 is devoted to HPSG analysis of those words.

3.1. The *bǎ*-Construction

The debate on the *bǎ*-and non-*bǎ*-construction was inspired by the language typology movement in the early seventies when Tai compared the Chinese *bǎ*-construction with the *bèi*-construction. The general consensus is that the *bèi*-construction represents the passive voice in Chinese. Tai observes that the *bǎ*-construction can usually be converted into a *bèi*-construction by demoting the subject of the *bǎ*-construction into a *bèi*-phrase and promoting the *bǎ*-NP to the subject in the *bèi*-construction, as is shown in the following.

(9) a. Zhāngsān bǎ Lǐsì dǎbài-le
Zhangsan BA Lisi fight-defeat-PER
'Zhangsan has defeated Lisi.'

b. Lǐsì bèi Zhāngsān dǎbài-le
Lisi BEI Zhangsan fight-defeat-PER
'Lisi has been defeated by Zhangsan.'

Tai claims that the conversion from the *bǎ*-construction to the *bèi*-construction reflects the general pattern of passivization found in other languages, such as English, and therefore should be treated as passivization in Chinese. Thus (9a) serves as the underlying active voice for the derived passive voice in (9b). Since (9a) is the underlying structure and it has both the subject and object in preverbal positions, Tai suggests that Chinese is underlyingly an SOV langauge. This is a direct challenge to the traditional belief that Chinese is basically an SVO language. In the SVO point of view, the *bǎ*-construction is derived from the non-*bǎ*-construction and the word *bǎ* functions as a coverb (or a preposition) that takes a post-verbal object NP and puts it into a preverbal position by the Object Fronting Rule. The reason that the object is fronted is for focus or emphasis. Under Tai's SOV analysis, however, the non-*bǎ*-construction is derived from the *bǎ*-construction since the *bǎ*-construction is the underlying structure in Chinese. But it was not clear why the *bǎ*-NP should move into a post-verbal position until Travis (1984) introduced the directionality hypothesis into Chinese syntactic analysis.

Li (1985) assumes with Travis that Chinese verbs assign theta role to the left and Case to the right. When the sentences in (9) are generated at deep structure, the patient role (the object) is to the left of the verb: if the object stays to the left of the verb, *bǎ* must be inserted before it so that the object can get Case; otherwise the object has to move to the right of the verb to get Case. Li claims that this is why in Chinese we have *bǎ*- and non-*bǎ*-construction alternations. So in Li's analysis, *bǎ* functions only as a Case assigner (or a Case marker). However, questions remain. Goodall (1989) notes the following sentences.

(10) a. Zhāngsān kū-de tiěshù kāi-le huā
Zhangsan cry-DE iron-tree open-PER flower
'Zhangsan cried so much that the iron tree burst into blossom.'

b. Zhāngsān bǎ tiěshù kū-de kāi-le huā
Zhangsan BA iron-tree cry-DE open-PER flower
'Zhangsan cried so much that the iron tree bursted into blossom.'

Note that in (10) *tiěshù* 'iron tree' can also appear on both side of the first verb *kū* 'cry': when it appears to the left of the verb, *bǎ* is used; when it appears to the right of the verb, no *bǎ* is used. However, *tiěshù* is not part of the verb *kū* 's theta role grid and therefore there is no reason why it should be base-generated to the left of the verb *kū*. Li's analysis does not offer any explanation of this.

In the next few sections, I will look into some detailed arguments on the treatment of the word *bǎ* as it affects different analyses of the valence alternation of Chinese verbs.

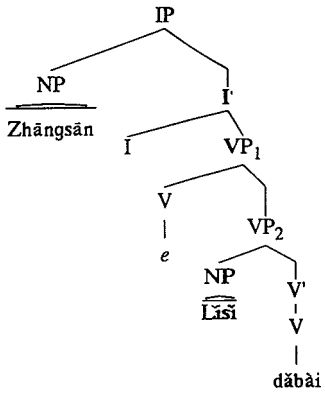
3.1.1. As a Light Verb

Huang (1991) picks up the problem that Li's (1985) analysis faces. He argues that *bǎ* should be treated as a light verb occupying the outer verb position in the Larsonian Shell. Thus a sentence like (11) is proposed to have the underlying structure of (11c).

(11) a. Zhāngsān bǎ Lǐsǐ dǎbài-le
Zhangsan BA Lisi fight-defeat-PER
'Zhangsan has defeated Lisi.'

b. Zhāngsān dǎbài-le Lǐsǐ
Zhangsan fight-defeat-PER Lisi
'Zhangsan has defeated Lisi.'

c.



In (11), V_1 is treated as a causative verb along the lines of the Larsonian Shell analysis in the English double object structure (Larson 1988). Thus we have options in filling up the V_1 position: either V_2 moves up so we get (11b), or the light verb *bǎ* is inserted under V_1 so we get (11a).

Note that the crucial difference here from Li (1985)'s analysis is that Huang treats *bǎ* as a verb rather than a preposition or a case marker. The word *bǎ* was historically used as a verb to mean 'hold' (Wang 1957 and Bennett 1981), as in *bǎ jiǔ* 'hold wine (and serve it)' and *bǎ zhǎn* 'hold the container (and serve the wine in it)'. Even in contempory Chinese we find a similar use of *bǎ* as in *bǎ niào* 'hold (the baby out) for urinating' and *bǎ dàmén* 'guard the gate'. It can be easily shown that the word *bǎ* in these phrases is still used as a verb. For instance, it can be inflected as in *bǎ-le yí cì niào* 'have held (the baby out) for urinating once' and in *Tā bǎ-zhe dàmén* 'He is guarding the gate'. However, Huang does not establish that the word *bǎ* in (11) is used as a verb. For instance, *bǎ* in (11) cannot take

any inflectional morpheme and it does not allow the NP it governs to be extracted like any other regular verb does (see Section 3.1.2. for examples and detailed discussion).

Another difficulty this analysis faces is that there are sentences which resemble (11b) but do not have *bǎ*-constructions and there are sentences that resemble (11a) but do not have non-*bǎ*-constructions, as is shown in the following.

(12) a. Zhāngsān chībǎo-le fàn.
Zhangsan eat-full-PER meal.
'Zhangsan is full (from eating his meal).'

b. *Zhāngsān bǎ fàn chībǎo-le
Zhangsan BA meal eat-full-PER

(13) a. Zhāngsān bǎ shūbāo fàngzài-le zhuōzishàng
Zhangsan BA book-bag place-at-PER table-top
'Zhangsan put the book bag on the table.'

b. *Zhāngsān fàngzài-le shūbāo zhuōzisgàng.
Zhangsan place-at-PER book-bag table-top

Evidently there are some kind of thematic constraints on the *bǎ*-phrase. And it is not clear, in a light verb analysis like Huang's, how one can make sure that in (12) *bǎ* cannot be inserted so that the lower verb is guaranteed to move up; or in (13) *bǎ* must be inserted so that the lower verb does not have a chance to move up. Huang does not offer any explanation.

A somewhat different suggestion is made in Yang (1995), where the word *bǎ* is taken to be the main (notional) verb of the sentence. Under this proposal, the verb *bǎ* subcategorizes for an NP and a special kind of VP[1]. Thus in an example like (11a), *bǎ* is base generated in the matrix verb position and it subcategorizes for the NP *Lǐsǐ* and the resultative verb compound *dǎbài-le* 'have defeated'. We would assume that under this approach (11b) should also be base generated with *dǎbài-le* as the main verb. Then the question is how we account for the semantic similarities between these two types of sentences. It is more than just a coincidence. Besides, how do we explain the fact that some resultative verbs like that in (12) cannot be subcategorized for by *bǎ* or the fact that some resultative verbs like that in (13) cannot be base generated but have to be subcategorized by *bǎ*?

Those difficulties aside, none of the approaches discussed above have given much empirical evidence that *bǎ* functions as a verb in the examples cited in their discussion. This problem is taken up in Zou (1994), where, for lack of evidence to treat *bǎ* as a verb,

[1] In Gao (1993) this special VP is argued to be headed by the resultative verb compound.

the word *bǎ* is classified as a morphosyntactic category that is the head of an extended projection of the inflectional morphemes. In this morphosyntactic analysis, the verbal projections in (11) start with the verb *dǎbài* 'defeat', then to inflectional phrase (Zou's PARP (particle phrase), and then to BAP (*bǎ* phrase). In (11a), the preverbal NP *Lǐsǐ* gets its theta role from the verb but then is moved to Spec of PARP to get (exceptional Case) from *bǎ*. So we assume that *bǎ* must be a Case-assigning category. But we still don't know what category it is. Are there any other words that behave the same way as *bǎ*, such as *duì*, *yòng*, *zài*, as will be discussed later? Other questions arise, such as where the subject NP gets Case? Certainly not from the Infl, because the Infl cannot even assign Case to its own Spec position. Where is the subject base generated? That is, where does it get its theta role? It cannot get it from the verb because if it did, then how could it move to Spec of BAP without crossing some barriers? If it is base generated in the Spec of BAP position, then *bǎ* must be its theta assigner. If this is true, then this analysis is no different from Yang (1995) and we may have the same questions.

To summarize, these verb, light verb, or quasi verb analyses of *bǎ* all fail to give a satisfactory explanation of the alternation of *bǎ* and non-*bǎ* constructions. Thus we will look for different analyses in the next few sections.

3.1.2. As a Preposition

In the last section I discussed some aproaches to the analysis of *bǎ* and non-*bǎ* alternations. A noticeable similarity of these analyses is the treatment of *bǎ* as a verb (or functional head in Zou 1994). As already pointed out, these analyses only assume that *bǎ* is a verb. None of them have presented any evidence supporting this assumption. A different point of view is to treat *bǎ* as belonging to a different category, such as a preposition (or a coverb in traditional Chinese grammar), or a marker in HPSG terms. First we look at the arguments that *bǎ* should be treated as a preposition. In Gao (1992) it has been argued extensively that *bǎ* does not behave like a verb. Rather, it is more like other so-called prepositions.

As is observed in all the previous analyses, *bǎ* always appear before an NP. This may suggest that *bǎ* behaves as a lexical item that subcategorizes for an NP. This would rule out the possibility of treating *bǎ* as anything other than a verb or a preposition[2], since in Chinese, as in English, only (transitive) verbs and prepositions take NP as their

[2] Prepositions in Chinese are sometimes known as co-verbs. Li and Thompson (1974) have argued that these co-verbs are not verbs and therefore there is no reason why they cannot be called prepositions. So long as they are different from verbs, whether they are called co-verbs or prepositions won't influence my analysis here. The term preposition is used here only for the sake of familiarity.

complement[3]. Therefore Gao compares the behavior of verbs and other prepositions in Chinese and shows that *bǎ* displays all the characteristics of a preposition and none of a verb.

First, the possibility of *bǎ* as a modal verb is ruled out, since Chinese modal verbs do not take NPs but VPs. The following tests in Chinese syntax (and morphology as well) are used to show that *bǎ* does not pattern closely with verbs.

3.1.2.1. NP Extraction

The first test consists of NP extraction. As is discussed in the literature (Huang 1982, Zhang 1990), Chinese is one of the languages that do not allow preposition stranding, although it is possible to extract an NP from a VP. The following examples show this phenomenon.

(14) Qìchē, tā mài-le.
car he sell-PER
'He sold (his) CAR.'

(15) [$_{NP}$ [$_{S}$ Lǐsi rènshi *e*] de nèi ge rén] mài-le qìchē.
Lisi know DE that CL person sell-PER car
'The person that Lisi knew sold the car.'

(16) *Chéngli, tā zài mài-le qìchē.
city he in sell-PER car
Intended reading: 'He sold his car in the city.'

(17) *[$_{NP}$ [$_{S}$ Tā cóng *e* lái] de nèi ge dìfāng] fēicháng měilì.
he from come DE that CL place very beautiful.
Intended reading: 'The place that he came from is very beautiful.'

Examples (14) and (15) show that it is possible to extract the postverbal object NP in Chinese. (14) is known as Topicalization and (15) is Relativization in terms of early transformational grammar. However, when we try to topicalize an NP as in (16) or relativize an NP as in (17) from a prepositional phrase, the result is ungrammatical. This shows that Chinese does not allow preposition stranding. If *bǎ* is a preposition, we should expect that no NP can be extracted from a *bǎ*-phrase. As the following examples show, this prediction is correct.

(18) *Qìchē, tā bǎ mài-le.
car he BA sell PER
Intended reading: 'The car, he sold.'

[3] It has been argued that some Chinese adjectives also take an NP complement. But when they do, they just act as verbs. Since their actual status will not be crucial to my analysis in this paper, I will assume that they are a special kind of (adjectival) verb.

(19) *[NP [S Tā bǎ e zhuāngmǎn-le qián] de kǒudài] hěn dà.
he BA fill-full-PER money DE pocket very big
Intended reading: 'The pocket he filled with money is very big.'

3.1.2.2. Inflectional Morphemes

Second, an ordinary Chinese verb can be inflected with one of the three inflectional morphemes[4]: the perfective *-le*, the progressive *-zhe*, and the experiential *-guo*, as is shown in the following examples.

(20) Tā chī-guo fàn le.
he eat-EXP meal LE
'He has eaten his meal.'

(21) Zhāngsān ná-le yì-běn shū.
Zhangsan take-PER one-CL book.
'Zhangsan took a book.'

(22) Lǐsì chàng-zhe gē.
Lisi sing-PROG song.
'Lisi is singing a song.'

But a typical preposition in Chinese does not take any inflectional morpheme[5]. This is shown in the following sentences.

4 There are different points of view concerning these elements. Recent studies (Li and Thompson 1981, Dai 1991, and Gao 1993) have argued strongly for these elements to be treated as inflectional morphemes.

5 Li and Thompson (1981) gives a few exceptions to this. The relevant explanation there, as well as in Li and Thompson (1974), is that these elements are originally verbs (in Ancient Chinese) and are still in the process of becoming full prepositions. Therefore they sometimes still take inflectional morphemes, either *-zhe* or *-le*, and when they do, they just function as verbs, not prepositions. This can be shown in the following examples.

(i) a. Tā na gùnzi dǎ rén.
he take stick hit person
'He hits people with sticks.'

b. Tā na -zhe gùnzi dǎ rén.
he take-DUR stick hit person
'He hits people while holding a stick in his hands.'

(ii) a. *Tā dài yǎnjing kàn shū.
he wear glasses look book

b. Tā dài-zhe yǎnjing kàn shū.
he wear-DUR glasses look book
'He reads with glasses.'

(iii) a. Tā yòng kuàizi chī fàn.
he use chopstick eat meal
'He eats (his meal) with chopsticks.'

b. *Tā yòng-zhe kuàizi chī fàn.
he use-DUR chopstick eat meal

(23) *Tā wǎng-guo Běijīng dǎ diànhuà.
he to-EXP beijing hit telephone
Intended reading: 'He has made telephone calls to Beijing.'

(24) *Zhāngsān cóng-le Wūlǔmùqí dàilái-le yì-ben shū.
Zhangsan from-PER Urumchi bring-come-PER one-CL book.
Intended reading: 'Zhangsan brought a book from Urumchi.'

(25) *Lǐsì zài-zhe qiángshàng guà yī-fú huà.
Lisi in-PROG wall-top hang one-CL picture.
Intended reading: 'Lisi is hanging a painting on the wall.'

If we assume *bǎ* to be a preposition, then it is not surprising that we cannot attach any of the inflectional morphemes to it. This is borne out through the following examples.

(26) *Tā bǎ-guo qìchē mài le.
he BA-EXP car sell LE
Intended reading: 'He has sold the car.'

(27) *Tā bǎ-le kǒudài zhuāng-mǎn qián.
he BA-PER pocket fill-full-PER money
Intended reading: 'He filled his pockets with money.'

(28) *Tā bǎ-zhe bìlú shēng huǒ.
he BA-PROG fireplace make fire
Intended reading: 'He is making fire in the fireplace.'

3.1.2.3. A-Not-A Questions

The third test is the use of A-not-A forms. In Chinese, a declarative sentence can be converted into a question by changing the verb in the sentence into a A-not-A form. The A-not-A form is made by reduplicating (part of) the verb and then putting the negation word *bu* or *mei* in between. For instance, the A-not-A form for the verb *chī* 'eat' is *chībuchī* or *chīmeichī* 'eat-not-eat'. In the same way, the A-not-A form for the verb *xǐhuān* 'like' is *xǐhuānbuxǐhuān* or *xǐbuxǐhuān* 'like-not-like'. The prepositions, however, do not undergo this change.

(29) Zhāngsān chīmeichīwan fàn?
Zhangsan eat-not-chi-finish meal
'Did Zhangsan finish his meal?'

(30) Lǐsì màibumài qìchē?
Lisi sell-not-sell car
'Does Lisi sell cars?'

(31) *Tā wǎngbuwǎng Běijīng dǎ-guo diànhuà?
he to-not-to Beijing hit-EXP telephone
Intended reading: 'Has he made any telephone calls to Beijing?'

These examples show that *ná* 'take' can be used both as a preposition in (1a) (denoting a single action) and a verb in (ib) (denoting a series of actions) but has different interpretations, *dài* 'wear' can only be used as a verb in (iib), and *yòng* 'use' now only has a prepositional function in (iiia).

(32) *Zhāngsān cóngmeicóng Wūlǔmùqì dàilái-le yì ben shū?
Zhangsan from-not-from Urumchi bring-come-PER one CL book
Intended reading: 'Did Zhangsan bring a book from Urumchi?'

If *bǎ* is a preposition, we expect it to behave like *wǎng* 'to' and *cóng* 'from' in not taking the A-not-A form. The following shows that the prediction is correct.

(33) *Tā bǎmeibǎ kǒudài zhuāng-mǎn-le qián?
he BA-not-BA pocket fill-full-PER money
Intended reading: 'Did he fill his pockets with money?'

(34) *Lǐsì bǎbubǎ érzi diū-le?
Lisi BA-not-BA son lose-PER
Intended reading: Did Lisi lose his son?

3.1.2.4. Scrambling

The final test involves the positions of the prepositional phrases. In Chinese, prepositional phrases always occur before the predicates. These preverbal prepositional phrases do not change positions with VPs. This is shown in the following examples.

(35) a. Tā zài chéngli mài-le qìchē.
he at city sell PER car
'He sold (his) car in the city.'

b. *Tā mài-le qìchē zài chéngli.
he buy PER car at city

As Li and Thompson (1974) note, in Chinese verbs denote actions or states of affairs. Since the temporal sequence of actions always determines the order of verb phrases in a serial verb construction[6] (Cf. Li and Thompson 1973 and Tai 1985), switching positions of verb phrases in a sentence often changes the meaning of the original structure. This is shown in the following examples.

(36) a. Lǐsì kāi tā de qìchē qù xuéxiào.
Lisi drive he DE car go school
'Lisi drives his car to go to school.'

b. Lǐsì qù xuéxiào kāi tā de qìchē.
Lisi go school drive he DE car
'Lisi goes to school to drive his car.'

6 As Tai (1985) points out, this temporal sequence constraint does not apply to coordinate VP structures, where repeated actions are often implied. In a coordinate VP structure, either VP precedes the other, as is shown in the following examples.

(i) Tā jīngcháng chōu yān hē jiǔ.
he often smoke cigarette drink wine
'He often smokes and drinks.'

(ii) Tā jīngcháng hē jiǔ chōu yān.
he often drink wine smoke cigarette
'He often drinks and smokes.'

(37) a. Zhāngsān dài-zhe yǎnjìng kàn shū.
Zhangsan wear-DUR glasses see book
'Zhangsan reads with glasses.'

b. Zhāngsān kàn-zhe shū dài yǎnjìng.
Zhangsan see-DUR book wear glasses
'Zhangsan follows (the instructions in) the book to put on his glasses.'

Prepositions, on the other hand, do not denote actions. Instead, they indicate relations[7] between their object and the verb. Prepositional phrases may just be some kind of modifiers. So there is no reason why PP's cannot switch positions among themselves without changing the meaning of the sentences. This is shown in the following examples.

(38) a. Tā zài jiāli gēn wǒ shuōhuà.
he at home with I say-speech
'He talks with me at home.'

b. Tā gēn wǒ zài jiāli shuōhuà.
he with I at home say-speech
'He talks with me at home.'

(39) a. Tā cóng jiāli bǎ wǒ gǎnchūlai-le.
he from home BA me drive-out-PER
'He drove me out of the house.'

b. Tā bǎ wǒ cóng jiāli gǎnchūlai-le.
he BA me from home drive-out-PER
'He drove me out of the house.'

(40) a. Zhāngsān bǎ fàn chīwan-le.
Zhangsan BA meal eat-finish-PER
'Zhangsan ate and finished the meal.'

b. *Zhāngsān chīwan-le bǎ fàn.
Zhangsan eat-finish-PER BA meal

The examples in (48) show that a *bǎ*-phrase can switch position with other preverbal prepositional phrases and those in (49) show that a *bǎ*-phrase cannot switch position with verb phrases. This tells us that *bǎ* indeed behaves exactly like a preposition.

Thus all the tests discussed above show that *bǎ* patterns closely with other prepositions rather than verbs and it seems that *bǎ*-phrase should be better treated as a prepositional phrase. However treating *bǎ* as a preposition also faces some difficulties. For instance, we notice from the discussion above that *bǎ* cannot be stranded, just like other prepositions in Chinese. Verbs, on the other hand, can be stranded. In other languages such as English both prepositions and verbs can be stranded. This is because prepositions and verbs have a lot of syntactic similarities. For instance, they both act as the head of their phrasal

7 Actually, these so called prepositions, as is shown later in the chapter, do not make new semantic contributions to the expressions that follow. They simply correlate the thematic relations of the following phrase and function more like case markers.

projection, subcategorize for the arguments they have, and have the ability of assigning syntactic case to their arguments. In other words, they can both lexically govern their arguments. Therefore there should be no difference between them as to the extractability of their argument NP's. The question now is why prepositions in Chinese behave differently than verbs in strandability.[8]

The second problem of treating *bǎ* as a preposition is that some otherwise observed binding relations between the *bǎ*-NP and another argument NP have been destroyed. As Li (1990) notices, the NP in the *bǎ*-phrase holds a binding relation to the postverbal NP's, as is shown in the following.

(41) Zhāngsān bǎ Lǐsǐ dǎduàn-le yī tiáo tuǐ.
Zhangsan BA Lisi beat-break-PER one CL leg
'Zhangsan has broken one of Lisi's legs.'

As Li notes, in (41) the leg that is broken has to be understood as Lisi's, not anyone else's. To account for this, Li proposes that in an inalienable NP like *yī tiáo tuǐ* 'a leg' there is always a possessive before the noun.[9] In the above example, Li claims that the possessive is a phonologically null anaphor pro and is bound by the first c-commanding NP. In an analysis where *bǎ* is treated as verb, the NP after *bǎ* can always fulfil this obligation and we get the correct interpretation. Li's criticism is that if we treat *bǎ* as a preposition to form a prepositional phrase with the following NP, this relation is no longer available because the NP after *bǎ* is no longer in a c-commanding position to the postverbal NP's. The different configurations is shown below.

(42) Treating *bǎ* as a verb

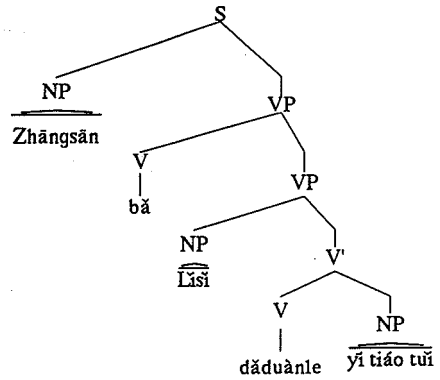
[8] As has been pointed out (Peter Culicover, personal communication) this is a problem for a lot languages and English is usual in this aspect. However, I am not making any claim that in languages where prepositions cannot be stranded, it is because they are not really prepositions. By raising this question, I simply want to point out that more investigation may be needed in determining the status of these words in Chinese.

[9] An alternative analysis is to treat the inalienable object structures as possessor ascension constructions (Dubinsky 1990 and Allen etc 1990). As Carl Pollard points out, the possessor ascension constructions in Chinese are always related to a subsort of ergative verbs such as *duàn* in the following sentences.

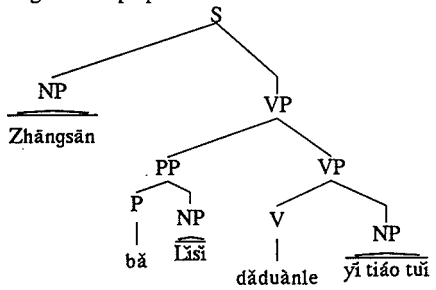
(i) Zhāngsān de yī-tiao tuǐ duàn-le.
Zhangsan DE one-CL leg break-PER
'Zhangsan's one leg broke.'

(i) Zhāngsān duàn-le yī-tiao tuǐ.
Zhangsan break-PER one-CL leg
'Zhangsan broke one leg.'

Due to various reasons, this line of analysis will not be pursued here. But it will be discussed in detail in a separate paper.



(43) Treating *bǎ* as a preposition



3.1.2.5. Argument PP's

The difficulties that the prepositional analysis of *bǎ* faces only exist in configurational approaches, where c-command is the key in forming the binding principles. However, in HPSG, where the binding principle is not based on syntactic configurations but on the argument hierarchy, the problems may not be so serious. According to Pollard and Sag (1992), nominal phrases in PP's may also participate in the binding relations if the PP's are subcategorized for by the verbs. Here are some examples in English.

(44) a. Julie$_i$ talked to Mary$_j$ about herself$_{i/j}$.
b. Julie$_i$ talked about Mary$_j$ to herself$_{i/*j}$.

In (44a) the coindexing between the NP *Mary* and the anaphor *herself* is possible even though the NP *Mary* is embedded in a PP and not in a c-command relation to the reflexive pronoun *herself*. Thus, the binding principles based on c-command fail to explain the binding relations in (44a). In HPSG, on the other hand, the binding principles are based on

an argument hierarchy known as the obliqueness hierarchy. In this approach, an anaphor is said to be bound by a less oblique co-argument. Thus, in (44), the *about* PP is considered more oblique than the *to* PP, hence the possibility of the coindexing in (44a) but not (44b).

What is relevant here is the treatment of those PP's that participate in the binding principles as complements. That is, these PP's are subcategorized for by the verbs and hence are part of the argument structure. There are other non-complement PP's such as adjunct PP's. Those PP's do not behave in the same way as the complement PP's in the binding principles. Examine the following.

(45) a. *John has worked under Jane$_i$ beside herself$_i$ since he was eighteen.

b. *John has worked beside Jane$_i$ under herself$_i$ since he was eighteen.

In (45) none of the PP's can serve as a binder for the anaphor in the other PP. This is because the two PP's in (45) are adjuncts, not complements. One of the distinctive properties between the two prepositions is their semantic denotations. Generally speaking, the ones in complements are known as Case-marking prepositions in English because they do not have any semantic content but only a syntactic function (analogous to marking case for the argument NP's) in the sentences. In (44), for example, the preposition *to* only indicates that the following argument NP *Mary* fills a certain argument role in the semantic relation corresponding to the verb (in this case, the addressee in the talking relation). However, the distinction between the case-marking prepositions and others is minimized in their syntactic behavior in English.

Different languages display different adpositional properties. In Japanese the postpositions are generally known as case-markers. And so are the postpositions in Korean. I will discuss the properties of the so called prepositions in Chinese in the following sections and show that those prepositions such as *bǎ* and *zài* really behave more like case-markers.

3.1.3. Case-Marking

Recall that Li (1985) assumes with Travis (1984) the Directionality Hypothesis. In this analysis, all NPs in a sentence must be Case-marked. There are two positions where case markers are not lexicalized because they are covered by abstract case. These are the subject and object positions. Thus in the first two sentences repeated below as (46), the NP *fàn* 'meal' in (46a) must be marked by *bǎ* simply because the preverbal non-subject position is not covered by an abstract Case.

(46) a. Zhāngsān bǎ fàn chīwán-le
Zhangsan BA meal eat-finish-PER
'Zhangsan has finished (eating) his meal.'

b. Zhāngsān chīwán-le fàn.
Zhangsan eat-finish-PER meal.
'Zhangsan has finished (eating) his meal.'

According to this analysis, there are two NP positions if the verb is transitive. For an intransitive verb, only one NP position is available. That is, any argument that appear in subject position or object position does not need any overt Case markers. Otherwise the argument must be Case marked by a preposition. Li (1990) gives the following to support her argument.

(47) . Jiāli lái rén le
home-inside come person PER
a. 'Someone has arived at (our) home.'
b. 'Someone has arived from (our) home.'

Explaining the ambiguity of the sentence, Li argues that the verb *lái* 'come' has two arguments, a theme and a goal or source. In (47) the theme NP takes the object position and no overt Case marker is needed for it. Then the goal argument or the source argument must stay to the left of the verb since there is only one object position available for the verb *lái*. If the argument was not in the subject position, a Case marker *cóng* 'from' may be inserted if it is source or *dào* 'to' may be inserted if it denotes goal. However, since in (47) the subject position is open, the goal or source NP must fill this position. Again no overt Case marker is needed since the subject position is covered by an abstract Case. However, the ambiguity remains since (47) comes from two different deep structures. This line of reasoning is also supported by other sentences. From Gao (1993) and (1996), we note the following set of examples.

(48) a. Zhāngsān dǎbài-le Lǐsì.
Zhangsan fight-defeat-PER Lisi
'Zhangsan has defeated Lisi (in a fight).'

b. Zhāngsān bǎ Lǐsì dǎbài-le
Zhangsan BA Lisi fight-defeat-PER
'Zhangsan has defeated Lisi (in a fight).'

c. Lǐsì dǎbài-le
Lisi fight-defeat-PER
'Lisi is defeated (in a fight).'

Assuming that the verb *dǎbài* is of the type ergative/unaccusative,[10] that is, it has an obligatory theme argument and an optional agent argument, the sentences in (48) can be explained as follows. In (48a-b), both arguments are present. The agent NP occupies the subject position and the theme NP takes the postverbal object position and we have (48a). Or the theme NP takes the preverbal position, which is not an NP position and *bǎ* must be

[10] Types of Chinese verbs are discussed in more details in Chapter Six.

inserted so that we have (48b). If only one argument is present, it has to be the theme and the verb is now known as an unaccusative. The theme NP then must take the subject position since an intransitive verb does not allow postverbal NP. This results in (48c). These sentences are supporting evidence for the assumption that there are NP positions, such as the object and subject positions, and non-NP positions in a sentence. In a non-NP position, a case-marking preposition must be used when a lexical argument occurs. The following is another set of sentences cited from Gao (1995) supporting this line of argument.

(49) a. Zhāngsān zài qiángshàng guà-le yí fù huà.
Zhangsan at wall-top hang-PER one CL painting
'Zhangsan has hung a painting on the wall.'

b. Qiángshàng guà-le yí fù huà.
wall-top hang-PER one CL painting
'A painting is hung on the wall.'

We can expain (49) in the following way. In Chinese the verb *guà* 'hang' has two obligatory arguments, theme and location, and an optional agent argument. When all three arguments are present, the agent NP takes the subject position, the theme NP occupies the postverbal object position, and the locative argument stays to the left of the verb.[11] The agent NP and theme NP are in NP positions and only the locative argument is in a non-NP position and therefore must be marked with *zài* . This results in (49a). If there are only two arguments present, the theme NP takes postverbal object position and the locative NP occupies the subject position. Since both arguments are in NP positions, no case-marking preposition is needed. This results in (49b). Thus we see that the word *zài* also behaves like a case marker. Since *bǎ* as a Case marker seems to be well argued for, I am ready to push this line of argument further to cover topic NP's.

Recall that in Chapter 2 I argued that in Chinese topic should be treated as additional type. That is, an NP can be added to the left of the subject as long as it bears 'aboutness' relation to the comment clause. According to the above analysis, topic should also be treated as an NP position in Chinese. Consider the following examples.

(50) a. Zhāngsān bǎ júzi bó-le pí.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the skin from the orange.'

b. (*bǎ) Júzi, Zhāngsān bó-le pí.
BA orange Zhangsan peel-PER skin
'The orange, Zhangsan has peeled off its skin.'

[11] This arrangement of arguments is determined by the argument selection principle discussed in Chapter Four.

c. Júzi, Zhāngsān bǎ pí bó-le.
orange Zhangsan BA skin peel-PER
'The orange, Zhangsan has peeled off its skin.'

(51) a. Zhāngsān zài qiángshàng guà-le yí fù huà.
Zhangsan at wall-top hang-PER one CL painting
'Zhangsan has hung a painting on the wall.'

b. (*zài) Qiángshàng Zhāngsān guà-le yí fù huà.
at wall-top Zhangsan hang-PER one CL painting
'On the wall, Zhangsan has hung a painting.'

In (50a), the verb *bó* 'peel' has three arguments: an agent, an affected theme, and a theme. The agent NP takes the subject position and the theme NP takes the postverbal object position. Since there are only two NP positions within the sentence, the word *bǎ* has to be used to mark the affected theme argument. However, we also have an option to take the affected NP to the pre-subject topic position as in (50b). Note that when the affected theme NP is in the topic position, no case marking preposition is needed. If we assume that the topic position in Chinese is also an NP position, then (50b) is readily explained. In (50c), it is the theme NP that appears in a non-NP position and needs a case marking preposition. The agent NP and affected theme NP are both in NP positions and don't need case makers. The examples in (51) show the same support for the assumption that topic in Chinese behaves like an NP position. So when the three arguments occupy topic, subject, and postverbal object positions, no case marker is necessary for any of these arguments.

From the above discussion we see that in a sentence with topic, there are three NP positions. Any argument that occurs in an non-NP position must be marked with one of the prepositions such as *bǎ*. Thus the use of *bǎ* is positionally determined and it is basically used to indicate the function of the following argument. Recall that in the last section we discussed some different PP's in English. Now we can see that *bǎ* behaves semantically much like a case-marking preposition. However, syntactically, *bǎ* is also different from the case-marking prepositions in English. For one thing, in English, even though they don't have much semantic content, those case-marking prepositions still behave like other prepositions in that they are syntactically independent words. In Chinese, on the other hand, *bǎ* cannot occur without the followiing NP. That is, it behaves much like a syntactic affix. This is why we believe *bǎ* should not be treated as a preposition, but a true case-marker, like those found in Japanese and Korean. Examine the following.

(52) a. [Nèi gè júzi]$_i$, Zhāngsān bǎ tā$_i$ bó-le pí.
that CL orange Zhangsan BA it peel-PER skin
'That orange, Zhangsan has peeled it off its skin.'

b. Zhāngsān bǎ $tā_i$ bó-le pí de [nèi gè júzi]$_i$.
Zhangsan BA it peel-PER skin DE that CL orange
'The orange that Zhangsan has peeled off its skin.'

c. Zhāngsān t_i bó-le pí de [nèi gè júzi]$_i$.
Zhangsan peel-PER skin DE that CL orange
'The orange that Zhangsan has peeled off its skin.'

(53) a. [Nèi gè rén]$_i$ Zhāngsān bǎ $tā_i$ dǎduàn-le yì tiáo tuǐ.
that CL person Zhangsan BA he beat-break-PER one CL leg
'That man, Zhangsan has broken one of his legs.'

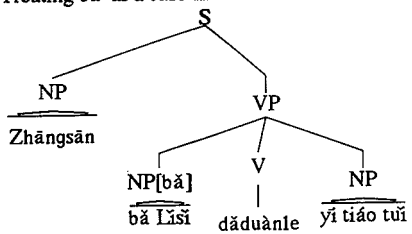
b. Zhāngsān bǎ $tā_i$ dǎduàn-le yì tiáo tuǐ de [nèi gè rén]$_i$.
Zhangsan BA he beat-break-PER one CL leg DE that CL person
'The man who Zhangsan has broken one of his legs.'

c. Zhāngsān t_i dǎduàn-le yì tiáo tuǐ de [nèi gè rén]$_i$.
Zhangsan beat-break-PER one CL leg DE that CL person
'The man who Zhangsan has broken one of his legs.'

Even though the verb *bó* 'peel' has only three arguments, we find four NP's in (52a). That is, one thematic role has to be shared with two NP's, forcing the second one to be an anaphoric expression. In (52a) one of the sharing NP's takes the topic position and the resumptive pronoun appears in the preverbal position. Thus, *bǎ* is used before the anaphor since this is a non-NP position. The same is true with the verb *dǎduàn* 'beat-break' in (53a).

We must understand that when we say *bǎ* is not an independent word, we mean that it must occur with a lexical item as its host. This is shown in the (b) and (c) sentences in the above examples. When an NP in a non-NP position is relativized with a phonologically empty anaphor, *bǎ* is not used; when a resumptive pronoun is used, *bǎ* must also occur. Thus I conclude that *bǎ* should be treated as a marker rather than a preposition or a verb in Chinese. This is shown in the following configuration.

(54) Treating *bǎ* as a case marker



3.2. *Zài* Constructions

We concluded in the last section that the word *bǎ* in Chinese is best treated as a Case marker. In this section we are going to examine another controversial element *zài*. The word *zài* raises much concern in syntactic studies because in many cases it still retains the function of a verb. For instance, in the following sentences we see that *zài* can have the A-not-A form.

(55) Zhāngsān zàibuzài jiā ?
Zhangsan at-not-at home
'Is Zhangsan home?'

(56) Tā de háizi hái zàibuzài měiguo dú shū ?
he DE child still at-not-at U.S. read book
'Is his son still in an American college?'

However, in many other cases we find that the word *zài* is no longer functioning as a verb, as is shown in the following.

(57) *Tā zàibuzài qiángshàng guà-le yì fú huà ?
he at-not-at wall-top hang-PER one CL painting
Intended: 'Has he hung a painting on the wall?'

The goal of this section is to distinguish the two uses of *zài* and to examine its non-verbal usage. We will argue that the non-verbal *zài* is also a Case marker, rather than a preposition.

3.2.1. When *zài* Does Not Function as a Verb

The non-verb *zài* is traditionally treated as a preposition (Li and Thompson 1981, Li 1990, Li 1995). It is frequently used with a locative NP to donate locations. In those studies, *zài*-phrases are generally seen to have the same function as locational prepositional phrases, as is shown in the following.

(58) Tā hěn kuài de zài běnzishàng xiě-le jǐ gè zì.
he very quickly DE at notebook-top write-PER several CL word
'He quickly wrote a few words on the notebook.'

(59) Tā zài shūbāolǐ fàng-le wǔ zhī qiānbǐ.
he at bookbag-inside place-PER five CL pencil
'He has put five pencils in his bookbag.'

(60) Tā zài nèi běn zìdiǎnxiàmiàn yā-le shí kuài qián
he at that CL dictionary-below press-PER ten CL money
'He has placed ten dollars under the dictionary.'

However, a closer comparison between *zài* phrases and English (nonpredicative) locative prepositional phrases reveals that there is no one to one correspondence in function between the elements within the two. First, a nonpredicative locative preposition in English

is a functional head with a full semantic content.[12] According to Jackendoff (1972) and (1987), an English preposition is syntactically the head of the prepositional phrase. It subcategorizes for an NP and assigns Case to it. Semantically, the preposition in a locational prepositional phrase is a functor that takes an NP and maps it into a location that is related to the NP. Thus in a phrase like *in the bookbag*, the preposition *in* takes an NP *the bookbag* and maps it into a space inside the bookbag. In the same way, *under* maps *the dictionary* into the space under the dictionary in the phrase *under the dictionary*. Chinese *zài*, on the other hand, lacks this kind of semantic function. That is, *zài* does not map the following NP into its related space. For instance, in a phrase like *zài shūbāolǐ* 'in the bookbag', *zài* does not take the phrase *shūbāolǐ* and maps it into the space inside the bookbag. The semantic interpretation 'inside the bookbag' is already in the phrase *shūbāolǐ*. Likewise, in the phrase *zài nèi běn zǐdiǎnxiàmiàn* 'under the dictionary', *zài* does not take the phrase *nèi běn zǐdiǎnxiàmiàn* and maps it to the space under the dictionary. The meaning of 'under the dictionary' is already in the phrase *nèi běn zǐdiǎnxiàmiàn*. In later chapters, I will argue that the phrases like *nèi běn zǐdiǎnxiàmiàn* and *shūbāolǐ* are not NP's. They are actually locational phrases composed of an NP and a locational affix. The semantic functions of the English locational prepositions have been taken over by these locational affixes in Chinese. Thus in the locational phrase *nèi běn zǐdiǎnxiàmiàn*, it is the locational affix *xiàmiàn* 'under' that maps the NP *nèi běn zǐdiǎn* 'that dictionary' into the space under the dictionary. Likewise, in the locational phrase *shūbāolǐ*, the locational affix *lǐ* 'inside' functions as mapping the NP *shūbāo* 'bookbag' into the space inside the bookbag. Therefore, it is reasonable to conclude that *zài* is only a functional element without any semantic content and should not be treated as the semantic equivalent of any of the English locational prepositions.

The difference between *zài* and English prepositions does not stop with semantics. In the next section, I will argue that syntactically *zài* is not the head of a so-called *zài*-phrase. It functions like the word *bǎ* in every aspect of syntax and therefore should also be treated as a marker rather than a preposition.

3.2.2. Comparison with *bǎ*

The word *zài* is not a semantic counterpart of any of the English locational prepositions. Syntactically, it does not function as the head of a phrase, either. Just like the word *bǎ*, its appearance depends on where the phrase that it combines with is located. For instance, *zài*

[12] As has been dscussed previously, some English prepositions, especially the ones in argument PP's, are semantically vacuous. These are known as the case-marking prepositions in HPSG.

usually combines with locational phrases (LP) and LP's usually occur preverbally (except when subcategorized for by locational verbs like *zǒuzài*, *tiàodào*, etc, in which case LP's can also occur postverbally). In the following examples, we see that when LP's occupy topic and subject positions, *zài* does not appear. It only occurs when LP's occupy preverbal positions other than the topic and subject.

(61) a. Tā zài běnzishàng xiě-le jǐ gè zì.
he at notebook-top write-PER several CL word
'He has written a few words on the notebook.'

b. Běnzishàng xiě-le jǐ gè zì.
notebook-top write-PER several CL word
'There are a few words written on the notebook.'

c. Běnzishàng, tā xiě-le jǐ gè zì.
notebook-top he write-PER several CL word
'On the notebook, he has written a few words.'

d. Tā bǎ zhè jǐ gè zì xiězài-le běnzishàng.
he BA this several CL word write-at-PER notebook-top
'He has written these words on the notebook.

e. Zhè jǐ gè zì, tā xiězài-le běnzishàng.
this several CL word he write-at-PER notebook-top
'It is these words that he has written on the notebook.

(62) a. Tā zài shūbāolǐ fàng-le wǔ zhī qiānbǐ.
he at bookbag-inside place-PER five CL pencil
'He has put five pencils in his bookbag.'

b. Shūbāolǐ fàng-le wǔ zhī qiānbǐ.
bookbag-inside place-PER five CL pencil
'There are five pencils in his bookbag.'

c. Shūbāolǐ, tā fàng-le wǔ zhī qiānbǐ.
bookbag-inside place-PER five CL pencil
'In his bookbag he has put five pencils .'

d. Tā bǎ nèi wǔ zhī qiānbǐ fàngzài-le shūbāolǐ.
he BA that five CL pencil place-at-PER bookbag-inside
'He has put those five pencils in his bookbag.'

e. Nèi wǔ zhī qiānbǐ, tā fàngzài-le shūbāolǐ.
that five CL pencil he place-at-PER bookbag-inside
'It is those five pencils that he has put in his bookbag.'

(63) a. Tā zài nèi běn zǐdiǎnxiàmiàn yā-le shí kuài qián.
he at that CL dictionary-below press-PER ten CL money
'He has placed ten dollars under the dictionary.'

b. Nèi běn zǐdiǎnxiàmiàn yā-le shí kuài qián.
that CL dictionary-below press-PER ten CL money
'There are ten dollars under the dictionary.'

c. Nèi běn zǐdiǎnxiàmiàn, tā yā-le shí kuài qián.
that CL dictionary-below he press-PER ten CL money
'He has placed ten dollars under the dictionary.'

d. Tā bǎ nèi shí kuài qián yāzài-le nèi běn zǐdiǎnxiàmiàn.
he BA that ten CL money press-at-PER that CL dictionary-below
'He has placed the ten dollars under the dictionary.'

e. Nèi shí kuài qián, tā yāzài-le nèi běn zǐdiǎnxiàmiàn.
that ten CL money he press-at-PER that CL dictionary-below
'It is the ten dollars that he has placed under the dictionary.'

Thus, from the above examples we see that *zài* is a positionally determined element and therefore should not be treated as the head of a phrase. If we assume that there are only three NP/LP positions and others are non-NP/LP positions, then the optional occurrence of the word *zài* can be readily explained: the subject and topic are NP/LP positions and therefore there is no need (or any possibility) for any markers to appear. In other preverbal positions, *zài* is present only because those are non-NP position and Chinese syntax requires that any NP/LP in these positions be marked. Therefore I propose that just like *bǎ*, *zài* must also be treated as a marker rather than a preposition. That is, when needed, *zài* is only an attachment to the LP, not an independent word. Treating *zài* as an attachment of the LP can also explain the similar phenomenon with *bǎ* when a topic dependent anaphor occurs or relativization is involved. Examine the following.

(64) a. Tā zài běnzishàng xiě-le jǐ gè zì.
he at notebook-top write-PER several CL word
'He wrote a few words on the notebook.'

b. [Běnzishàng]$_i$, tā zài nèir$_i$ xiě-le jǐ gè zì. (Cf 61c)
notebook-top he at there write-PER several CL word
'On the notebook, he wrote a few words there.'

c. Tā zài nèir$_i$ xiě-le jǐ gè zi de [běnzishàng]$_i$
he at there write-PER several CL word DE notebook-top
'the notebook that he has written a few words on.'

d. Tā t_i xiě-le jǐ gè zi de [běnzishàng]$_i$
he write-PER several CL word DE notebook-top
'the notebook that he has written a few words on.'

(65) a. Tā zài shūbāolǐ fàng-le wǔ zhī qiānbǐ.
he at bookbag-inside place-PER five CL pencil
'He has put five pencils in the bookbag.'

b. [Shūbāolǐ]$_i$ tā zài nèir$_i$ fàng-le wǔ zhī qiānbǐ. (Cf 62c)
bookbag-inside he at there place-PER five CL pencil
'In the bookbag, he has put five pencils there.'

c. Tā zài nèir$_i$ fàng-le wǔ zhī qiānbǐ de [shūbāolǐ]$_i$.
he at there place-PER five CL pencil DE bookbag-inside
'in the bookbag where he has put five pencils.'

d. Tā t_i fàng-le wǔ zhī qiānbǐ de [Shūbāolǐ]$_i$.
he place-PER five CL pencil DE bookbag-inside
'in the bookbag where he has put five pencils.'

(66) a. Tā zài zǐdiǎnxiàmiàn yā-le shí kuài qián
he at dictionary-below press-PER ten CL money
'He has placed ten dollars under the dictionary.'

b. [Zǐdiǎnxiàmiàn]$_i$, tā zài nèir$_i$ yā-le shí kuài qián. (Cf 63c)
dictionary-below he at there press-PER ten CL money
'Under the dictionary, he has placed ten dollars there.'

c. Tā zài nèir$_i$ yā-le shí kuài qián de [zǐdiǎnxiàmiàn]$_i$
he at there press-PER ten CL money DE dictionary-below
'Under the dictionary where he has placed ten dollars.'

d. Tā t_i yā-le shí kuài qián de [zǐdiǎnxiàmiàn]$_i$
he press-PER ten CL money DE dictionary-below
'Under the dictionary where he has placed ten dollars.'

We see in the above sentences that relativization of LP is possible and the appearance of the word *zài* is only necessary (and only possible) when the gap is filled with a phonologically realized resumptive pronoun. Again, we can better explain this with the hypothesis that *zài* is a phrasal affix that marks locational phrases. By contrast, if the relative gap is occupied by a trace (a phonologically null resumptive pronoun), *zài* lacks a phonological host and cannot occur.

3.2.3. Two Different *zài* 's

In the last subsections, we argued that *zài* is best treated as a marker rather than a preposition, along the lines of the *bǎ* analysis. We also showed at the beginning of this section that some occurences of *zài* still display the characteristics of a verb. Thus we have two different functions of *zài* in use in contemporary Chinese, a verb *zài* and a marker *zài*. Since both of them can occur preverbally and both take a locational phrase, a few words seem in order on how to distinguish them.

First, when *zài* is used as a verb, the following locational phrase generally indicates the location of the subject. When *zài* is used as a marker, the following locational phrase can only describe where the other argument is, not the subject.

(67) a. Tā zài shūbāolǐ fàng-le wǔ zhī qiānbǐ.
he at bookbag-inside place-PER five CL pencil
'He has put five pencils in the bookbag.'

b. Tā zài qiángshàng guà-le yī fú huà.
he at wall-top hang-PER one CL painting
'He has hung a painting on the wall.'

(68) a. Tā zài jiālǐ chī-le yī dùn fàn.
he at home-inside write-PER one CL meal
'He had a meal inside the house.'

b. Tā zài Běijīng dú-le yī nián dàxué.
he at Beijing read-PER one year university
'He went to college for a year when he was in Beijing.'

In (67a) we understand that only the five pencils are in the bookbag, not the subject *tā* 'he'. In (67b), the subject *tā* 'he' is not on the wall but a painting is. In contrast, the subject *tā* 'he' has to be in the house in (68a) and in Beijing in (68b). Thus we understand that *zài* is a marker in (67), where *fàng* 'place' is a verb in (67a) and *guà* 'hang' in (67b). In (67a), the verb *fàng* has three arguments with the agent being optional. When the agent *tā* is absent, the locational phrases can occupy the subject position. In this case we have the sentences in (69).

(69) a. Shūbāolǐ fàng-le wǔ zhī qiānbǐ.
bookbag-inside place-PER five CL pencil
'There are five pencils put in the bookbag.'

b. Qiángshàng guà-le yī fú huà. (= 49b)
wall-top hang-PER one CL painting
'There is a painting hung on the wall.'

This is in sharp contrast with (68) where *zài* is used as a verb subcategorizing for two arguements: a theme and a location describing where the theme is located. Since the verb is the head of the locational expression,[13] it is obligatory and structures analogous to (69) cannot happen with (68).[14]

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[13] Following Carl Pollard's suggestion, I treat this locational expression headed by the verb *zài* as an absolutive adjunct. Evidence for this syntactic status can be seen from the fact that this expression can also occur in sentence initial positions, as other sentential modifiers do.

(i) Zài jiālǐ, tā chī-le yī dùn fàn.
at home-inside he eat-PER one CL meal
'He had a meal inside the house.'

(ii) Zài Běijīng, tā dú-le yī nián dàxué.
at Beijing he read-PER one year university
'He went to college for a year when he was in Beijing.'

As for the question why it can take A-not-A form in as shown in (72), I would assume with Zhang (1994) that in Chinese all [+V] categories can take A-not-A form. This includes not only verbs, but also adjectives and adverbs. Thus the *zài* phrases in (i) and (ii) are sentential modifiers and therefore are treated as the same as other adverbial phrases as shown in the following.

(iii) Tā cháng-bu-cháng lái jiālǐ?
he often-not-often come home-inside
'Does he often come home?'

[14] So-called locative inversion in Chinese seems to lend support to this claim. Consider the following examples.

(i) a. Tā bǎ wǔ zhī qiānbi fàngzài-le shūbāolǐ
he BA five CL pencil place-at-PER bookbag-inside
'He has put five pencils in the bookbag.'

(70) a. *Jiālǐ chī-le yī dùn fàn.
home-inside write-PER one CL meal
Intended: 'There is a dinner eaten inside the house.'

b. *Běijīng dú-le yī nián dàxué.
Beijing read-PER one year university
Intended: 'There is a college gone to once in Beijing.'

It is also possible to distinguish the two uses of *zài* by using the A-not-A test. If the word *zài* is used as a verb, it should be able to assume A-not-A form. If it is used as a marker, it should not. The following examples show that *zài* is used as a marker in (67) and a verb in (68).

(71) a. *Tā zàibuzài shūbāolǐ fàng-le wǔ-zhī qiānbǐ?
he at-not-at bookbag-inside place-PER five-CL pencil
Intended: 'Has he put five pencils in the bookbag?'

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b. Tā bǎ yī fú huà guàzài-le qiángshàng.
he BA one CL painting hang-at-PER wall-top
'He has hung a painting on the wall.'

(ii) a. Nèi wǔ zhī qiānbi fàngzài-le shūbāolǐ .
that five CL pencil place-at-PER bookbag-inside
'The five pencils have been put in the bookbag.'

b. Nèi yī fú huà guàzài-le qiángshàng.
that one CL painting hang-at-PER wall-top
'That painting has been hung on the wall.'

(iii) a. *Tā bǎ yī dùn fàn chīzài-le jiālǐ.
he BA one CL meal write-at-PER home-inside
Intended: 'He has had one meal inside the house.'

b. *Tā bǎ yī nián dàxué dúzài-le Běijīng.
he BA one year university read-at-PER Beijing
Intended: 'He has spend one of his college years in Beijing.'

(iv) a. *Nèi yī dùn fàn chīzài-le jiālǐ.
that one CL meal write-at-PER home-inside
Intended: 'That meal was eaten inside the house.'

b. *Nèi yī nián dàxué dúzài-le Běijīng.
that one year university read-at-PER Beijing
Intended: 'That one of his college years in Beijing.'

Zhang 1990 claims that (69) are the locative inversion sentences relative to (ii). If this were true, then we could say that only when *zài* is used as a marker is locative inversion possible. However, in Gao and Tai 1996 and later chapters, when these structures are studied closely, it is shown that two different verbs are involved here and the so-called locative inversion claimed in Zhang 1990 does not exist. So I am reluctant to conclude that (i)-(iv) should be used as direct evidence for the distinction of the two usages of *zài* claimed here.

b. *Tā zàibuzài qiángshàng guà-le yī-fú huà?
he at-not-at wall-top hang-PER one-CL painting
Intended: 'Has he hung a painting on the wall?'

(72) a. Tā zàibuzài jiālǐ chī fàn?
he at-not-at home-inside eat-PER meal
'Does he have dinners inside the house?'

b. Tā zàibuzài Běijīng dú dàxué?
he at-not-at Beijing read university
'Does he go to college in Beijing?'

Finally, although both phrases can appear in the pre-subject position, different uses of *zài* result in different constructions. For the phrase with *zài* as a marker, it appears in the topic position without the (unnecessary) marker *zài*. However, for a phrase with *zài* as the verb, the whole verb phrase must appear in the front of the sentence.

(73) a. Shūbāolǐ, tā fàng-le wǔ-zhī qiānbǐ.
bookbag-inside he place-PER five-CL pencil
'In the bookbag, he has put five pencils.'

b. Qiángshàng, tā guà-le yī-fú huà.
wall-top he hang-PER one-CL painting
'On the wall, he has hung a painting.'

(74) a. Zài jiālǐ tā zhǐ chīguo yī-dùn fàn.
at home-inside he only eat-PROG one CL meal
'While in the house, he only had one meal .'

b. Zài Běijīng tā dúle yī-nián dàxué.
at Beijing he read-PER one-year university
'While in Beijing, he went to college for a year.'

3.3. Other Constructions

We have looked at *bǎ* and *zài* in Chinese and have shown that they should be treated not as prepositions or verbs but as Case markers. In this section, we investigate some other words that are also treated as prepositions in the literature. Using the same criteria as in the previous sections, we show that they also demonstrate most of the characteristics of *bǎ* and *zài* and therefore need to be treated as markers.

3.3.1. *Yòng*

The first word to be investigated is *yòng*. As is the case with *zài*, we notice that *yòng* also has two functions, a verb and a marker. In some cases it is hard to tell whether it has the marker function. For instance, when it is used immediately after the subject, it is possible to inflect it with the perfective morpheme *le*, as is shown in (75a).

(75) a. Tā yòng(-le) yī-bǎ dāo bǎ nèi-gè xīguā qiēchéng-le
he use(-PER) one-CL knife BA that-CL watermelon cut-become-PER
liǎng bàn.
two half
'He used a knife and cut the watermelon into halves.'

b. Tā bǎ nèi-gè xīguā yòng(*-le) yī-bǎ dāo qiēcheng-le
he BA that-CL watermelon with one-CL knife cut-become-PER
liǎng bàn.
two half
'He cut the watermelon into halves with a knife.'

However, when *yòng* is used after the *bǎ* phrase, that is, inside the verb phrase, the inflectional morpheme is no longer an option, as is shown in (75b). Thus I believe that *yòng* in (75a) is ambiguous without the inflectional morpheme and in (75b) it is used only as a marker. Like *bǎ* and *zài*, the NP after *yòng* can be relativized with a resumptive pronoun *tā/lái*[15] or a phonologically null variable. Although it seems impossible to topicalize the *yòng*-NP, the left dislocation construction is perfectly grammatical.

(76) a. Tā yòng lái/tā$_i$ bǎ nèi-gè xīguā qiēcheng-le liǎng bàn
he with it BA that-CL watermelon cut-become-PER two half
de [nèi-bǎ dāo]$_i$.
DE that-CL knife
'the knife with which he cut the watermelon into halves'

b. Tā t_i bǎ nèi-gè xīguā qiēcheng-le liǎng bàn de [nèi-bǎ dāo]$_i$.
he BA that-CL watermelon cut-become-PER two half DE that-CL knife
'The knife with which he cut the watermelon into halves'

(77) a. [Nèi-bǎ dāo]$_i$ ta yòng lái/tā$_i$ bǎ nèi-gè xīguā qiēcheng-le
that-CL knife he with it BA that-CL watermelon cut-become-PER
liǎng bàn.
two half
'With that knife he cut the watermelon into halves.'

b. *[Nèi-bǎ dāo]$_i$. tā t_i bǎ nèi-gè xīguā qiēcheng-le liǎng bàn.
that-CL knife he BA that-CL watermelon cut-become-PER two half
Intended: 'With that knife he cut the watermelon into halves.'

3.3.2. *Gěi*

The word gei also has two functions. When used as a verb, it can be inflected with *le* or *guo*, and can also undergo A-not-A interrogation, as is shown in (78a) and (79b).

[15] I am not absolutely sure that *lái* should be treated as a resumptive pronoun. The relevant facts are that when the NP after *yòng* is relativized, either *tā* or *lái* or both must be used to serve as an anchor for the instrumental marker *yòng*. Without one or both of these two words, *yòng* must be dropped and cannot remain in the relative clause. The status of *lái* is not crucial in this analysis as long as we understand that the only thing we need to show here is that the marker *yòng* always need a phonological host to attach to.

However, when it is used before another inflected main verb, its ability to be inflected and undergo A-not-A interrogation is lost. This is shown in (78b) and (79b).

(78) a. Wǒ gěi-le Lǐsi yī-běn xiǎoshuō
I give-PER Lisi one-CL novel
'I have given Lisi a novel.'

b. Wǒ gěi(*-le) Lǐsi sòng-le yī-běn xiǎoshuō
I to-PER Lisi give-PER one-CL novel
'He have given a novel to Lisi.'

(79) a. Nǐ gěiméigěi Lǐsi nèi-běn xiǎoshuō?
you give-not-give Lisi that-CL novel
'Have you given Lisi that novel?'

b. *Nǐ gěiméigěi Lǐsi sòng-le nèi-běn xiǎoshuō?
you to-PER Lisi give-PER that-CL novel
Intended: 'Have you given that novel to Lisi?'

When *gěi* loses its ability to be inflected or undergo A-not-A interrogation, it no longer functions as a verb. Instead, it shows the typical characteristics of a marker: when the NP after it appears in the topic position, it is no longer necessary. When there is a resumptive pronoun *tā* in the case of the so-called left dislocational construction, it must be used with the anaphoric resumptive pronoun. The same is also true when the NP after it is relativized in the examples in (81).

(80) a. Lǐsi, wǒ sòng-le yī-běn xiǎoshuō
Lisi I give-PER one-CL novel
'Lisi, I have given a novel.'

b. [Lǐsi]$_i$, wǒ gěi *(tā$_i$) sòng-le yī-běn xiǎoshuō
Lisi I to he give-PER one-CL novel
'Lisi, I have given a novel for/to him.'

(81) a. Wǒ t_i sòng-le yī-běn xiǎoshuō de [nèi-gè rén]$_i$.
I give-PER one-CL novel DE that-CL person
'the person whom I have given a novel.'

b. Wǒ gěi *(tā$_i$) sòng-le yī-běn xiǎoshuō de [nèi-gè rén]$_i$.
I to he give-PER one-CL novel DE that-CL person
'the person to whom I have given a novel.'

Thus we assume that the second function of *gěi* shown in the above examples is a marker indicating the following NP is of a dative Case.

3.3.3. Others (*cóng, duì*, etc.)

Compared with *zài, yòng*, and *gěi*, the following examples show that *cóng* 'from', *duì* 'concerning', and *xiàng* 'towards' also behave like case markers. (82a-b) show that *cóng*

does not behave like a verb. (82c) shows that *cóng* is not needed when the relative phrase is in the subject position. (83) and (80) show that *cóng* must have a host phrase to attach to when topicalization and relativization takes place.

(82) a. Tā cóng(*-le/*-guo/*zhe) jiāli gěi wǒmen dàilái-le
he from-PER/EXP/DUR home-inside to us bring-come-PER
xǔduō hǎochī de dōngxi
many good-eat DE thing
'He has brought us many delicious things from home.'

b. *Tā cóngbucóng jiāli gěi wǒmen dàilái-le xǔduō
he from-not-from home-inside to us bring-come-PER many
hǎochi de dōngxi?
good-eat DE thing
Intended: 'Has he brought us many delicious things from home.'

c. Jiāli gěi wǒmen dàilái-le xǔduō hǎochī de dōngxi.
home-inside to us bring-come-PER many good-eat DE thing
'We were brought many delicious things from home.'

(83) a. Jiāli tā dàilái-le xǔduō hǎochī de dōngxi
home-inside he bring-come-PER many good-eat DE thing
'He has brought over many delicious things from home.'

b. [Jiāli]$_i$ tā cóng nèir$_i$ dàilái-le xǔduō hǎochī de dōngxi
home-inside he from there bring-come-PER many good-eat DE thing
'He has brought over many delicious things from home.'

(84) a. tā t_i gěi wǒmen dàilái-le xǔduō hǎochī de dōngxi de [nèi
he to us bring-come-PER many good-eat DE thing DE that
gè dìfāng]$_i$
CL place
'the place where he has brought us many delicious things.'

b. tā cóng nèir$_i$ gěi wǒmen dàilái-le xǔduō hǎochī de dōngxi
he from there to us bring-come-PER many good-eat DE thing
de [nèi gè dìfāng]$_i$
DE that CL place
'the place where he has brought us many delicious things.'

There is close resemblance between *bǎ* and *duǐ*. (85) show that *duǐ* can also trigger valence alternation and it does not behave like a verb. (86) show that in topicalization constructions, *duǐ* is used only when there is a phonologically realized anaphor as a host phrase for it. The same is true with relativization, as is shown in (87).

(85) a. Zhāngsān hěn mǎnyì zhè-jian shì.
Zhangsan very satisfy this-CL matter
'Zhangsan is satisfied with this matter.'

b. Zhāngsān duì zhè-jian shì hěn mǎnyì.
Zhangsan concerning this-CL matter very satisfy
'Zhangsan is satisfied with this matter.'

c. *Zhāngsān duìbuduì zhè-jian shì hěn mǎnyì.
Zhangsan concerning-not-concerning this-CL matter very satisfy
Intended: 'Is Zhangsan satisfied with this matter?'

d. *Zhāngsān duì(*-le/*-guo/*-zhe) zhè-jian shì hěn mǎnyì.
Zhangsan concerning-PER/EXP/DUR this-CL matter very satisfy
Intended: 'Zhangsan has been satisfied with this matter.'

(86) a. Zhè-jian shì, Zhāngsān hěn mǎnyì.
this-CL matter Zhangsan very satisfy
'Zhangsan is satisfied with this matter.'

b. [Zhè-jian shì]$_i$, Zhāngsān duì tā$_i$ hěn mǎnyì.
this-CL matter Zhangsan concerning it very satisfy
'Zhangsan is satisfied with this matter.'

(87) a. Zhāngsān hěn mǎnyì de nèi-jian shì.
Zhangsan very satisfy DE that CL matter
'the matter with which Zhangsan is satisfied'

b. Zhāngsān duì tā$_i$ hěn mǎnyì de [nèi-jian shì]$_i$
Zhangsan concerning it very satisfy DE that-CL matter
'the matter with which Zhangsan is satisfied'

The following show that *xiàng* also behave like a case marker, not a verb.

(88) a. Wǒmen xiàng(*-le) Léi Fēng xuéxí zhùrénwéilè de jīngshén.
we towards-PER Lei Feng learn help-people-as-pleasure DE spirit
'We learn from Lei Feng the spirit of helping people as a pleasure.'

b. *Wǒmen xiàngbuxiàng Léi Fēng xuéxí zhùrénwéilè de
we towards-not-towards Lei Feng learn help-people-as-pleasure DE
jīngshén?
spirit
Intended: 'Do we learn from Lei Feng the spirit of helping people as a pleasure?'

(89) a. Léi Fēng, wǒmen xuéxí zhùrénwéilè de jīngshén.
Lei Feng we learn help-people-as-pleasure DE spirit
'From Lei Feng, we must learn the spirit of helping people as a pleasure.'

b. [Léi Fēng]$_i$, wǒmen xiàng tā$_i$ xuéxí zhùrénwéilè de jīngshén.
Lei Feng we from he learn help-people-as-pleasure DE spirit
'From Lei Feng, We learn the spirit of helping people as a pleasure.'

(90) a. Wǒmen t_i xuéxí zhùrénwéilè de jīngshén de [nèi-gè rén]$_i$
we learn help-people-as-pleasure DE spirit DE that-CL person
'the person from whom we learn the spirit of helping people as a pleasure.'

b. Wǒmen xiàng tā$_i$ xuéxí zhùrénwéilè de jīngshén de [nèi
we towards he learn help-people-as-pleasure DE spirit DE that
gè rén]$_i$
CL person
'the person from whom we learn the spirit of helping people as a pleasure.'

3.4. Marking-marked Construction

We have shown in the above sections that all the so-called prepositions in Chinese should be best treated as Case markers. However, the exact status of a Case marker varies from language to language. For instance, Case markers in Russian, Greek, and Turkish, can be morphological. That is, they are word affixes and must be dealt with in the morphology. In Japanese, the status of the case markers is not so clear. They are variously claimed to be morphological affixes or postpositions. The same is true with Korean. In this section we will try to show that the Chinese Case markers are actually phrasal affixes and can be best dealt with in the syntax as marking-marked constructions in HPSG.

3.4.1. The Status of Markers in Chinese

Before going into the detailed analysis of Chinese markers, we first take a look at the Japanese and Korean markers. The assumption that the conversion of verbs to markers in Chinese may be the result of Japanese and Korean influence can be traced back to Tai's (1973) claim that Chinese is changing from an SVO to an SOV language. In a recent survey (Gao and Tai 1996) of the *bǎ* construction, we find that almost all northern dialect speakers use only the *bǎ* construction in (91a) and (92a) rather than the serial verb construction in (91b) and (92b), which is the only word order in archaic Chinese.

(91) a. Wǒ bǎ shū chángzài guìzilǐ.
I BA book hide-at cupboard-inside
'I hide the book in the cupboard.'

b. Wǒ cháng shū zài guìzilǐ.
I hide book at cupboard-inside
'I hide the book in the cupboard.'

(92) a. Wǒ bǎ tā tuīdào shāfāshàng.
I BA he push-to sofa-top
'I push him onto the sofa.'

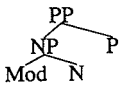
b. Wǒ tuī tā dào shāfāshàng.
I push he to sofa-top
'I push him onto the sofa.'

Note that in (91) *shū* 'book' is the object of *cháng* 'hide' in both sentences, and in (92) *tā* 'he' is the object of *tuī* 'push' in both sentences. The only difference in these pairs is that

with the help of *bǎ* the object can occur preverbally. That is, with the help of *bǎ*, Chinese demonstrates some characteristics of an SOV language. The unacceptability of the (b) sentences in the above examples by northern dialect speakers of Chinese suggests that this change may be spreading from north to south. Since Japanese and Korean are both SOV languages and have frequent contact with northern dialects of Chinese, it is plausible to assume that this change may be triggered by these SOV languages. Thus an understanding of the Japanese and Korean case markers might be relevant to the analysis of the Chinese case markers.

As noted in the literature (Kuno 1973, Gunji 1987, No 1991, Chung 1993), both Japanese and Korean are typical SOV languages. That is, they display mostly head-final properties. Thus the head of the NP is always at the right edge of the nominal phrase. Since they are also postpositional, the head of PP is always at the right edge of the postpositional phrase and adjacent to the head of NP that it combines with. This is shown in the following configuration.

(93) A postpositional phrase in Japanese and Korean



As head final languages, Japanese and Korean also display the head of a sentence -- the main verb -- at the right edge of the sentence. Thus the arguments of the verb are all to the left of the verb and can usually be distinguished by case markers at the right edge of the argument phrases. This is shown in the following examples.

(94) a. Ku namwu-nun Mary-ka kaci-lul calassta. (Korean)
the tree-TOP Mary-NOM branch-ACC cut
'As for the tree, Mary cut its branch.'

b. Mary-ka ku namwu-lul kaci-lul calassta.
Mary-NOM the tree-ACC branch-ACC cut
'Mary cut the branch of the tree.'

(95) Hanako-ga kono hon-o yonda. (Japanese)
Hanako-NOM this book-ACC read
'Hanako read this book.'

Note also that, in the above examples, the case markers, which are traditionally treated as morphological suffixes, also occupy the right edge position of the argument phrases. Thus it is hard to distinguish them from some of the postpositions found in these languages. One possible way to test whether they are morphological suffixes or postpositions is to see whether these markers can be lexically separated from the head noun. But unfortunately in

these languages (at least in Korean according to my informant) postnominal modifiers are very hard to find. However, there are other ways in which these markers do not behave like postpositions. As No (1991) and Chung (1993) note, these markers are positionally determined and are not generated in the lexicon with the head nouns. For instance, when an object NP is topicalized, the accusative marker *lul* cannot appear with the NP in the pre-subject position. Instead, the accusative marker has to be dropped and a topic marker *nun* is added. This is shown in (94) above. Secondly, these markers cannot stand alone. That is, the existence of these markers seems to depend on the occurrence of the head nouns. For example, when the NP is relativized, the marker that follows the head noun does not remain in the original gap position, nor does it co-occur with the filler NP. It has to be dropped. This is shown in the following.

(96) John-i [[t_i(*-ka) na-lul salangha-n un] yeca$_i$-lul] mannasse
John-NOM NOM I-ACC love-PRES REL woman-ACC met
'John met a woman who loves me.'

These observations seem to characterize the case markers in Japanese and Korean as affixes: They have no independent syntactic status and have to co-exist with other syntactic items. They are positionally determined and have no independent semantic interpretation. Since these case markers always occur adjacent to the head of the phrase, they may be treated as morphological affixes. (See Tomabechi 1989 for detailed arguments that Japanese case markers are not postpositions but rather markers). Now let us come back to the Chinese case markers.

As has been shown in earlier sections, Chinese case markers also display some of the same characteristics as in Japanese and Korean: They are syntactically dependent on the existence of other phrases and many of them have very little semantic content. However, the major difference is that the Chinese case markers are not adjacent to the head of the phrases they are attached to. As has been discussed in the literature (Huang 1984, Li 1990, Li and Thompson 1981), Chinese nominal phrases are very consistent in displaying head-final features. That is, the head noun is always located at the right edge of a noun phrase. The case markers, on the other hand, are consistently found to occur at the left side of the phrases. That is, there can be all sorts of lexical items intervening between a head noun and a case marker. This is shown in the examples below.

(97) a. Lǐsi bǎ píngguǒ fàngzài kuāngzilǐ.
Lisi BA apple place-at basket-inside
'Lisi puts the apples inside the basket.'

b. Lǐsi bǎ nèi jǐ-gè hóng píngguǒ fàngzài kuāngzilǐ.
Lisi BA that several-CL red apple place-at basket-inside
'Lisi puts several of those red apples inside the basket.'

c. Lǐsi bǎ diàozài dìshàng de píngguǒ fàngzài kuāngzilǐ.
Lisi BA drop-at ground-top DE apple place-at basket-inside
'Lisi puts inside the basket the apples that have fallen to the ground.'

d. Lǐsi bǎ cóng shùshang diàoxiàlai de píngguǒ fàngzài kuāngzilǐ.
Lisi BA from tree-top drop-down DE apple place-at basket-inside
'Lisi puts inside the basket the apples that have fallen from the tree.'

(98) a. Lǐsi zài kuāngzilǐ fàng-le xǔduō píngguǒ.
Lisi at basket-inside place-PER many apple
'Lisi puts the apples inside the basket.'

b. Lǐsi zài Zhāngsān de kuāngzilǐ fàng-le xǔduō píngguǒ.
Lisi at Zhangsan DE basket-inside place-PER many apple
'Lisi puts the apples inside Zhangsan's basket.'

c. Lǐsi zài zhuāng-le pútao de kuāngzilǐ fàng-le xǔduō píngguǒ.
Lisi at load-PER grape DE basket-inside place-PER many apple
'Lisi puts the apples inside the basket that has been loaded with some grapes.'

d. Lǐsi zài yòng zhúzi biān de kuāngzilǐ fàng-le xǔduō píngguǒ.
Lisi at with bamboo weave DE basket-inside place-PER many apple
'Lisi puts the apples inside the basket that is weaved with bamboo.'

Thus, the Chinese case markers cannot be treated as morphological affixes. Instead, we assume they are phrasal affixes. However, they are not clitics in the sense of Zwicky (1991) or Halpern (1993), since these markers are generated by syntactic necessity rather than from some semantic motivation. That is, clitics, according to Zwicky, have semantic denotation while our markers do not. Markers only correlate the syntactic arguments they mark with thematic roles the corresponding semantic arguments play.

3.4.2. Marking-Marked Construction

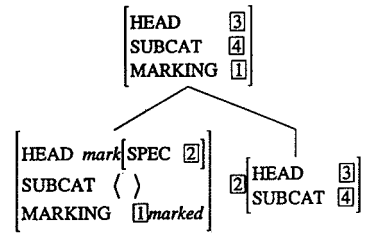
The Chinese case markers have been argued to be phrasal affixes, and in HPSG phrasal affixes can be analyzed with ID Schema 4 -- the head-marker-structure[16] (Pollard and Sag 1994) which is given in (99).

(99) a. Head-marker schema: XP --> Y^0[SPEC [1]] [1]XP
MARKER HEAD

[16] Those markers, although argued to be phrasal affixes, are still morphological words because they always carry full tones. Real (morphological) affixes in Chinese may have the option of being toneless.

b. A phrase with DTRS value of sort head-marker-structure whose marker daughter is a marker whose SPEC value is structure-shared with the SYNSEM value of the head daughter, and whose MARKING value is structure-shared with that of the mother.

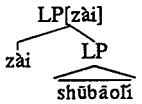
c.



In this analysis, a marker is a word that is functional or grammatical as opposed to substantive. That is, the semantic content of a marker is vacuous. As we have seen from previous discussions, the Chinese case markers fit this definition very well. Examples of *bǎ* NP and *zài* LP[17] are given below.

(100) a. the analysis of *bǎ Lǐsǐ*

b. the analysis of *zài shūbāolǐ*



Since the case markers are only lexical items and are not the head of the phrase, the addition of the case markers does not affect the categorial status of the original phrase. Thus *bǎ Lǐsǐ* and *Lǐsǐ* are both NPs in (96a) and the only difference between the two is that *bǎ Lǐsǐ* is a marked NP and *Lǐsǐ* is an unmarked NP. The same is true of (100b): *zài shūbāolǐ* is a marked LP and *shūbāolǐ* is an unmarked LP. In both cases the NP and LP remain the heads of the phrases.

Recall that in a Chinese sentence with topic, we have shown that there are three NP/LP positions if the verb is transitive, and other positions are non-NP/LP positions. With the analysis of markers, these non-NP/LP positions are now treated as marked NP/LP positions and they should behave syntactically just like other NPs/LPs. Examine the following.

(101) a. [Wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$, [Zhāngsān názǒu-le [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$]$_S$.
five-CL apple Zhangsan take-away-PER three-CL
'As for the five apples, Zhangsan took away five of them.'

[17] See Chapter 5 for arguments for the necessity to distinguish nominal phrases (NP) from locative phrases (LP) in Chinese.

b. [Wǔ-gè [píngguǒ$_i$]$_{N'}$]$_{NP}$ [shǎo-le [sān-gè [pro'$_i$]$_{N'}$]$_{NP}$]$_{VP}$
five-CL apple miss-PER three-CL
'Three of the five apples are missing.'

c. Zhāngsān [[bǎ [wǔ-gè [píngguǒ$_i$]$_{N'}$]$_{NP}$]$_{NP}$ názǒu-le [sān-gè [pro'$_i$]$_{N'}$]$_{NP}$]$_{VP}$
Zhangsan BA five-CL apple take-go-PER three-CL
'Zhangsan has taken away three of the five apples.'

In (101) we have a pro' in the object position. This pro' can be coindexed with a nominal in an o-commanding argument. In (101), this argument is *wǔ-gè píngguǒ* 'five apples' and no matter what position it occurs in, it is always treated as an NP and its N' head can be easily coindexed with the pro'.

Still another case where an o-commanding NP is needed as a binder is when the reflexive pronoun *tāzìjǐ* 'himself' is the bindee. As discussed in the literature (Tang 1989, Gao 1990), even though Chinese reflexive binding (especially the long distance binding) is subject-oriented for the bare reflexive pronoun *zìjǐ* 'self', the pronoun-reflexive combination *tāzìjǐ* still needs a local o-commanding binder. Compare the following.

(102) a. Zhāngsān$_i$ gàosù-le Wángwǔ$_j$ zìjǐ$_{i/*j}$ de fēnshu.
Zhangsan tell-PER Wangwu self DE score
'Zhangsan has told Wangwu his score.'

b. Zhāngsān$_i$ gàosù-le Wángwǔ$_j$ tāzìjǐ$_{i/j}$ de fēngshu.
Zhangsan tell-PER Wangwu self DE score
'Zhangsan has told Wangwu his own score.'

(103) a. Zhāngsān$_i$ shuō Lǐsǐ$_j$ zhīdào Wángwǔ$_k$ bù xiāngxìn zìjǐ$_{i/j/k}$.
Zhangsan say Lisi know Wangwu not trust self
'Zhangsan said Lisi knew that Wangwu did not trust himself.'

b. Zhāngsān$_i$ shuō Lǐsǐ$_j$ zhīdào Wángwǔ$_k$ bù xiāngxìn tāzìjǐ$_{*i/*j/k}$.
Zhangsan say Lisi know Wangwu not trust himself
'Zhangsan said Lisi knew that Wangwu did not trust himself.'

Since a marked NP is still an NP, it should also be able to serve as a local binder. This is shown in the following.

(104) a. [Zhāngsān$_i$]$_{NP}$ [zhùzài [tāzìjǐ$_i$ de fángzilǐ]$_{NP}$]$_{VP}$.
Zhangsan live-at himself DE house-inside
'Zhangsan lives in his own house.'

b. Zhāngsān [bǎ Lǐsǐ$_i$]$_{NP}$ [guānzài [tāzìjǐ$_i$ de fángzilǐ]$_{NP}$]$_{V'}$.
Zhangsan BA Lisi close-at himself DE house-inside
'Zhangsan shuts Lisi up in his(=Lisi's) own house.'

(105) a. [Zhāngsān$_i$]$_{NP}$ [cóng tāzìjǐ$_{i/*j}$ de jiālǐ]$_{LP}$ [bǎ Lǐsǐ$_j$]$_{NP}$ [gǎn-le chūlái]$_{V'}$.
Zhangsan from himself DE home-inside BA Lisi chase-PER out
'Zhangsan has chased Lisi out of his(Zhangsan's) house.'

b. [Zhāngsān$_i$]$_{NP}$ [bǎ Lǐsǐ$_j$]$_{NP}$ [cóng tāzìjǐ$_{i/j}$ de jiālǐ]$_{LP}$ [gǎn-le chūlái]$_{V'}$.
Zhangsan BA Lisi from himself DE home-inside chase-PER out
'Zhangsan has chased Lisi out of his own house.'

Recall that in HPSG the binding theory is built on argument hierarchies. A PP headed by a case-marking preposition is treated as an argument and therefore it can still serve as an antecedent for a more oblique anaphoric expression. Thus in HPSG binding theory, it makes no difference if the case-marking prepositions are traeted as prepositions or markers. However, in this thesis, treating them as markers seems to have the following advantages and these advantages seem to come from the distinction that prepositions, no matter case-marking or otherwise, are always independent words, as the case of English, while markers are dependent words and generally need phonological host, as is the case of Japanese and Korean.

First, it correctly predicts the occurrence of these elements. Recall that we have shown that the occurrence of these elements is positionally determined. That is, they only occur between the verb and the subject and in conjunction with other NP/LP's. Thus (un)acceptability in the following is readily explained.

(106) a. [Zhè-ge rén]$_{NPi}$, wǒ jìbude (*bǎ) [tā]$_{NPi}$ le.
this-CL person I remember-not BA him LE
'As for this person, I can't remember him any more.'

b. [Zhè-ge rén]$_{NPi}$, wǒ zǎo *(bǎ) [tā]$_{NPi}$ wàng-le.
this-CL person I early BA him forget-PER
'As for this person, I have long forgotten him.'

In (106) we see that the resumptive pronoun *tā* in both examples is coindexd with *zhège rén*. But in postverbal position in (106a) it appears alone, while in preverbal position in (106b), it appeares with *bǎ*.

Another advantage of the marker analysis (as opposed to treating them as heads) is that then the things they mark have the same category (either NP or LP) no matter which posiiton (topic, subject, marked-object, unmarked-object) they appear in.

Third, treating the case marking elements as markers show the categorial uniformity between the binder and the bound. It is true that under the HPSG formation of the binding theory, categorial information is not considered a factor between the binder and the bound, and therefore a PP can still be the antecedent for an NP anaphor. However, in Chinese, there are instances where a category other than an NP is not allowed to serve as the antecedent of an NP anaphor even if the o-command relation is satisfied. In later Chapters I will argue that a locative phrase belongs to a different category than an NP. Consider the following.

(107) a. Zhāngsān bǎ [zhuōzi]$_{NPi}$ shuaiduàn-le pro$_i$ yì-tiao tuǐ.
Zhangsan BA table throw-break-PER one-CL leg.
'Zhangsan threw the table and one of its legs broke.'

b. Zhāngsān zài [[zhuōzi]$_{NPi}$ -shàng]$_{LPj}$ shuaiduàn-le pro$_{*i/*j}$ yī-tiao tuǐ.
Zhangsan ZAI table-top throw-break-PER one-CL leg.
'Zhangsan broke one of his legs on the table.'

c. [Zhuōzi]$_{NPi}$ shuaiduàn-le pro$_i$ yī-tiao tuǐ.
table throw-break-PER one-CL leg.
'The table was thrown and one of its legs was broken.'

d. [[Zhuōzi]$_{NPi}$ -shàng]$_{LPj}$ shuaiduàn-le pro$_{*i/*j}$ yī-tiao tuǐ.
table-top throw-break-PER one-CL leg.
'Something was thrown on the table and one of its legs was broken.'

In (107) we see that both marked NP and LP are in the preverbal non-subject position and therefore are in the o-commanding position for the null possessive pro. However, only the NP in (107a) and (107c) can bind the pro. The LP in (107b) and (107d) fails to be the antecedent for the pro because the antecedent and the pro belong to different categories and therefore do not qualify to have binding relations. Note that *zhuōzi* 'table' in (107b) cannot bind the pro either because it is buried in the LP argument and therefore fails to be a local binder for the pro. If we look back at (106), we may find the same situation if we treat *bǎ* as a preposition: PPs and NPs belong to different categories and should not be able to have binding relations. However, if we treat *bǎ* as a marker, the situation in (106) becomes different from that in (107). Since marked NP's are still NP's, they are qualified to be in the binding relations.

One possible candidate for a preposition is the word *bèi*, an agent indicator that has always been closely compared to the English preposition *by* in a passive sentence. Like its English counterpart, the word *bèi* generally appears only in passive sentence indicating the following NP as the agent. This is shown in the following example.

(107) e. Zhuozi$_i$ bèi Zhāngsān$_j$ shuāiduàn-le pro$_{i/*j}$ yī-tiáo tuǐ.
table BEI Zhangsan beat-break-PER one-CL leg
'One of Zhangsan's legs was broken by Lisi.'

Compared to (107a), where *zhuōzi* 'table' is proceded by *bǎ* and can serve as the binder for the pro in the postverbal NP, in (107e), however, *Zihāngsān* is not able to serve as the binder. If we treat *bèi* as a preposition heading an adjunct PP, (107e) then can be explained: *Zhāngsān* in (107e) does not o-command the postverbal pro and therefore cannot be a potential binder.[18] Thus the different binding effect can be seen from the different treatment of the two words *bǎ* and *bèi*.

[18] Since we have adopted a flat VP structure in the paper, c-command still cannot explain the binding relations among the (internal) arguments within the sentence. This is because in a flat VP structure, all the complements within the VP c-command each other and it will wrongly predict that the unmarked complement can be a potential binder for the marked complement in Chinese. Thus in later chapters, we will use o-command in the binding theory.

3.4.3. Valence Alternations

I have discussed the properties of the lexical items such as *bǎ*, *zài*, and *gěi*, etc, which are traditionally known as prepositions. I have shown that these words make little semantic contribution to the phrase they combine with and have only functional values. They were also shown to be phrasal affixes because they do not exist without the phrases they combine with. Thus it is best to treat them as markers. This analysis has some expected consequences. First, since they are no longer treated as the heads of the phrases, but phrasal affixes, the long standing question why Chinese does not allow those elements to be stranded is now answered. Second, since the markers are not substantive and semantically vacuous, their existence does not alter the interpretation of the original phrase. Furthermore, since they are markers, they do not alter the syntactic categories of the original phrase. Thus we find that Chinese, compared to other languages such as English and Japanese, etc., allows more variation in displaying verbal arguments in its phrase structures. For instance, the same argument can appear as an unmarked complement or a marked complement. This makes it much easier to explain the valence alternations shown at the beginning of this chapter with the following word order principle.

(108). The Chinese Word Order Principle (preliminary version)
In displaying the internal arguments of a verb (the valence of the verb except the subject) in a sentence, Chinese allows each argument to take the form of either an ummarked complement that must appear to the right of the verb, or a marked complement that must appear to the left of the verb.

According to (108), the valence alternation examples (repeated below for convenience) can be thus explained: in the (a) sentences the complements are unmarked and we thus have the SVO word order; in the (b) sentences, the complements are marked and therefore we see only the SOV word order.

(1) a. Zhāngsān chīwán-le fàn.
Zhangsan eat-finish-PER meal.
'Zhangsan has finished (eating) his meal.'

b. Zhāngsān bǎ fàn chīwán-le
Zhangsan BA meal eat-finish-PER
'Zhangsán has finished (eating) his meal.'

(2) a. Wǒmen yào xuéxí Léi Fēng.
we must learn Lei Feng
'We must learn from Lei Feng.'

b. Wǒmen yào xiàng Léi Fēng xuéxí.
we must towards Lei Feng learn
'We must learn from Lei Feng.'

(3) a. Lǐsì qù-le Běijīng.
Lisi go-PER Beijing
'Lisi went to Beijing.'

b. Lǐsì wǎng Běijīng qù-le.
Lisi toward Beijing go-PER
'Lisi went to Beijing.'

(4) a. Zhāngsān hěn mǎnyì zhè jian shì.
Zhangsan very satisfy this CL matter
'Zhangsan is satisfied with this matter.'

b. Zhāngsān duì zhè jian shì hěn mǎnyì.
Zhangsan concerning this CL matter very satisfy
'Zhangsan is very satisfied with this matter.'

(5) a. Mǎlì lái-guo měiguó.
Mary come-EXP U.S.A.
'Mary has been to the United States.'

b. Mǎlì dào měiguó lái-guo.
Mary arriving U.S.A. come-EXP
'Mary has been to the United States.'

(6) a. Tángmǔ zǒuchū shēn-shān-lǎo-lín lái le.
Tom walk-out deep-mountain-old-forest come LE
'Tom has walked out of the remote mountain forests.'

b. Tángmǔ cóng shēn-shān-lǎo-lín zǒuchū lái le.
Tom from deep-mountain-old-forest walk-out come LE
'Tom (finally) walked out of the remote mountain forests.'

(7) a. Lisi chángchaǐng chī fànguǎn.
Lisi often eat restaurent
'Lisi often eats in restaurants.'

b. Lisi chángchaǐng zài fànguǎn chī fàn.
Lisi often at restaurent eat meal
'Lisi often eats his meals in restaurants.'

(8) a. Lisi bū huǐ chī kuàizi.
Lisi not know-how eat chopsticks
'Lisi does not know how to eat with chopsticks.'

b. Lisi bū huǐ yòng kuàizi chī fàn.
Lisi not know-how use chopsticks eat meal
'Lisi does not know how to eat (his) meals with chopsticks.'

With verbs that have more than one internal argument, the same principle may also apply, as is shown in the following.

(109) a. Lisi zài běnzishàng xiěcuò-le yí gè zì.
Lisi at notebook-top write-wrong-PER one CL word
'Lisi wrote a wrong word on the notebook.'

b. Lisi zài běnzishàng bǎ yí gè zì xiěcuò-le.
Lisi at notebook-top BA one CL word write-wrong-PER
'Lisi wrote a wrong word on the notebook.'

c. *Lisi bǎ yí gè zì xiěcuò-le běnzishàng.
Lisi BA one CL word write-wrong-PER notebook-top

However, as (109c) shows, not all complements can appear on either side of the verb. The ungrammaticality of (109c) will be shown to violate other constraints imposed by Chinese grammar: the argument hierarchy which will be discussed in Chapter 4 and the distinction between a nominal phrase and locational phrase which will be discussed in Chapter 5. In Chapter 6 I will discuss the revision and final version of the Chinese Word Order Principle.

Before leaving this chapter, I would like to discuss some of the apparent counterexamples to the preliminary version of the Chinese Word Order Principle. Some of these examples come from Mulder and Sybesma (1992) (henceforth M&S), who, in arguing that Chinese is still a SVO language, cite the following example.

(110) Tā guà-le yì dǐng màozi zài qiáng-shàng (= M&S 32b)
he hang-PER one CL hat at wall-top
'He has hung a hat on the wall.'

M&S argue that (110) is a free variant of (111) (a kind of valence alternation in this paper) and therefore *zài qiáng-shàng* is still a prepositional phrase (and since this shows that Chinese has prepositions and prepositional phrases also occur postverbally, Chinese must still be an SVO language). And they propose a small clause analysis for the postverbal complements.

(111) Tā zài qiáng-shàng guà-le yì dǐng màozi
he at wall-top hang-PER one CL hat
'He has hung a hat on the wall.'

While we agree that (110) is acceptable, we disagree with them that *zài qiáng-shàng* in (110) should be treated as a PP (a marked complement (LP) in our newly suggested analysis). Actually, (110) may have a very different structure than (111). Note that in (110) the verb must be in its perfective tense while there is no such a restriction on (111).

(112) *Tā zhèngzài guà yì dǐng màozi zài qiáng-shàng
he PROGRESSIVE hang one CL hat at wall-top

(113) Tā zhèng zài qiáng-shàng guà yī dǐng màozi[19]
he PROGRESSIVE at wall-top hang one CL hat
'He is just hanging the hat on the wall.'

In their reply to M&S, Gao and Tai (1997) note that all the prepositions that M&S cited that appear postverbally have a verb form currently in use in Chinese and *zài* in (110) is one of them. Actually, Ngor (1990) has some observations on the same types of sentences that show *zài qiáng-shàng* should be analyzed as an VP. Ngor's analysis starts with the following example.

(114) Lisi rènshi yī gè rén hén yǒuqián.
Lisi know one CL person very have-money
'Lisi knows a person who is very rich.'

Ngor notes that a small clause analysis for *yī gè rén* and *hén yǒuqián* is not tenable. First, a small clause analysis would have to assume that yī gè rén is base generated as the subject of the VP *hén yǒuqián*. However, as the following show, the subject of a clause can be a definite NP. But if we replace the indefinite NP *yī gè rén* 'a person' in (114) with a definite NP *nèi gè rén* 'that person', it results in an unacceptable sentence in (116).[20]

(115) a. Nèi gè rén hén yǒuqián.
that CL person very have-money
'That person is very rich.'

b. Yī gè rén hén yǒuqián.
one CL person very have-money
'A person is very rich.'

(116) *Lisi rènshi nèi gè rén hén yǒuqián.
Lisi know that CL person very have-money

Although Ngor does not give an explanation why (116) is unacceptable, the comparison here strongly suggests that the postverbal elements in (114) do not form a clause.

Second, Ngor notes that a pronoun can freely appear between *yī gè rén* and *hén yǒuqián* , as is shown in (117).

(117) Lisi rènshi yī gè rén tā hén yǒuqián.
Lisi know one CL person he very have-money
'Lisi knows a person who is very rich.'

[19] The original form of the sentence seems to be the following.

(i) Tā zhèngzài zài qiáng-shàng guà yī dǐng màozi
he PROGRESSIVE at wall-top hang one CL hat
'He is just hanging the hat on the wall.'

However, due to the haplology constraint in Chinese, the progressive adverbial becomes *zhèng* rather than *zhèngzài*. Hence the actual sentence in (113).

[20] I don't know of any explanation for the unacceptibility of this sentence. Nor do I have any ready explanation for it.

Thus Ngor suggests that the best analysis is to assume that in (114) there is a null pronoun pro between *yī gè rén* and *hén yǒuqián* and thus there are two full clauses in (114). Compared to (114) we notice that (110) may have the same structure.

(118) a. Yī dǐng màozi zài qiáng-shàng.
one CL hat at wall-top
'A hat is on the wall.'

b. Nèi dǐng màozi zài qiáng-shàng.
that CL hat at wall-top
'The hat is on the wall.'

(119) *Tā guà-le nèi dǐng màozi zài qiáng-shàng.
he hang-PER one CL hat at wall-top
Intended: 'He has hung the hat on the wall.

(120) Lisǐ guà-le yī dǐng màozi tā zài qiáng-shàng
Lisi hang-PER one CL hat it at wall-top
'Lisi has hung a hat on the wall.'

In this two clause analysis of (110) the phrase *zài qiáng-shàng* can no longer be treated as a prepositional phrase (or marked LP in our analyis) since in Chinese prepositional phrases (or marked LP) cannot serve as predicates.

A second example of this sort comes from the word *gěi*, as is shown in the following.

(121) a. Lisǐ gěi wǒ sòng-le yī-běn shū.
Lisi to I give-PER one-CL book
'Lisi has given a book to me.'

b. Lisǐ sòng-le yī-běn shū gěi wǒ.
Lisi give-PER one-CL book to I
'Lisi has given a book to me.'

Again (119) seem to suggest that the prepositional phrase (or the marked NP) *gěi wǒ* can appear on either side of the verb.[21] However, the following examples suggest that they involve different structures.

(122) a. Lisǐ gěi wǒ zuò-le yī wǎn miàn.
Lisi to I cook-PER one CL noodle
'Lisi has cooked a bowl of noodles for me.'

b. Lisǐ zuò-le [yī-wǎn miàn]$_i$ [gěi wǒ [e_i]$_{NP}$]$_{VP}$.
Lisi cook-PER one-CL noodle give I
'Lisi has cooked a bowl of noodles for me.'

(123) a. Lisǐ gěi wǒ zuò-le yī-dùn fàn.
Lisi to I cook-PER one-CL meal
'Lisi has cooked a meal for me.'

b. *Lisǐ zuò-le [yī-dùn fàn]$_i$ [gěi wǒ [e_i]$_{NP}$]$_{VP}$.
Lisi cook-PER one-CL meal give I

[21] It is claimed in the literature (Tai 1985) that preverbal *gěi* is ambiguous between benefactive and dative while postverbal *gěi* can only be dative.

The difference between (122) and (123) is the choice of the classifier in the postverbal NPs. In Chinese, two kinds of classifiers are distinguished: a nominal classifier describes the shape of a (physical) object and a verbal classifier describes an event(-uality). In (122) ***wǎn*** is a nominal classifier and is used to describe the quantity of the noodles. So this is a physical object and is certainly transferable (can be given to me). In (123), on the other hand, ***dùn*** is a verbal classifier and it describes the procedure of Lisi's cooking, hence an event and an event is not transferable (Lisi's cooking cannot be given to me). Thus I propose that the postverbal ***gěi wǒ*** should be treated as a VP functioning as a purpose adjunct rather than a marked complement. This analysis is supported by the following examples.

(124) a. Lǐsì gěi-le wǒ yī-wǎn miàn.
Lisi give-PER me one-CL noodle
'Lisi has given me a bowl of noodles.'

b. *Lǐsì gěi-le wǒ yī-dùn fàn.
Lisi give-PER me one-CL meal

This line of analysis suggests that there is a link between the postverbal NP and the phrase ***gěi wǒ*** in (122). I propose that there is an empty category after ***wǒ*** in the phrase ***gěi wǒ*** that is coindexed with the postverbal NP, hence explaining the unacceptability of (123b) the same way as that of (124b): after ***gěi wǒ*** 'give me', there is an empty category that is coindexed with ***yī dùn fàn***, an NP with a verbal classifier. Since the verb ***gěi*** does not take any NP with verbal classifier, the sentence is ruled out as unacceptable. This is the same analysis involving the English sentence *He bought something$_i$ to give me* _$_i$.This line of analysis is confirmed when we use the verb ***chī*** 'eat' instead of the phrase ***gěi wǒ***.

(125) a. Lǐsì zuò-le yī **wǎn** miàn chī
Lisi cook-PER one CL noodle eat
'Lisi has cooked a bowl of noodles to eat.'

b. Lǐsì zuò-le yī **dùn** fàn chī.
Lisi cook-PER one CL noodle eat
'Lisi has cooked a meal for me to eat.'

(126) a. Wǒ chī-le yī **wǎn** miàn.
I eat-PER one CL noodle
'I have had a bowl of noodles.'

b. Wǒ chī-le yī **dùn** fàn.
I eat-PER one CL meal
'I have had a meal.'

Note that ***chī*** 'eat' is a transitive verb and can take NPs with both classifiers, as is shown in (126). Therefore the acceptability of both sentences in (125) is expected. This in turn suggests that the postverbal ***gěi*** cannot be analyzed as a preposition/marker since a preposition does not subcategorize for more than one complement and a marker is never

found to attach to two separate phrases. Hence we conclude that the postverbal ***gěi*** needs to be treated as a verb. Therefore we have discharged the counter examples to the Word Order Principle in Chinese.

Chapter 4

HIERARCHICAL ARGUMENT STRUCTURES

4.0. Introduction

In Chapter 3 I showed that valence alternation in Chinese is largely due to the flexible phrase structure grammar in the language that allows variety of arguments. Basically, Chinese grammar tolerates both marked (NP/LP) complements as well as unmarked complements and marked complements appear only to the left of the verb while the unmarked complements may appear to the right of the verb. Thus the following alternations can be expected.

(1) a. Zhāngsān bǎ shūjià bǎimǎn-le shū.
Zhangsan BA bookshelf place-full-PER book
'Zhangsan has filled the bookshelf full of books.'

b. Zhāngsān bǎ shū bǎimǎn-le shūjià.
Zhangsan BA book place-full-PER bookshelf
'Zhangsan has filled the books onto bookshelves.'

In (1), the verb *bǎimǎn* has two complements. Since it can only take one unmarked argument, the other has to be realized as a marked argument and appear to the left of the verb. However, not all verbs in Chinese allow free arrangement of their complements. Examine the the following.

(2) a. Zhāngsān [bǎ júzi]$_{NP}$ bō-le [pí]$_{NP}$.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the orange of its skin.'

b. *Zhāngsān [bǎ pí]$_{NP}$ bō-le [júzi]$_{NP}$.
Zhangsan BA skin peel-PER orange

c. Zhāngsān bō-le [yí-gè júzi]$_{NP}$.
Zhangsan peel-PER one-CL orange
'Zhangsan has peeled an orange.'

d. Zhāngsān bō-le [júzi (de) pí]$_{NP}$.
Zhangsan peel-PER orange DE skin
'Zhangsan has peeled the orange skin.'

e. Zhāngsān bǎ [júzi (de) pí]$_{NP}$ bō-le.
Zhangsan BA orange DE skin peel-PER
'Zhangsan has peeled the orange skin.'

In (2) we see that the monotransitive verb *bō* can take at most one unmarked complement. When there are two complement arguments as in (2a) and (2b), one argument has to be marked and appear to the left of the verb. Note that of the two complement arguments, only *pí* can serve as the unmarked complement.

The second thing to be noticed in the arangement of arguments comes from the following examples, where the determination of the subject is at stake.

(3) a. Zhāngsān guà-le yí-fù huà.
Zhangsan hang-PER one-CL painting
'Zhangsan has hung a painting.'

b. *Yí-fù huà guà-le Zhāngsān.
one-CL painting hang-PER Zhangsan

(4) a. Qiángshang guà-le yí-fù huà.
wall-top hang-PER one-CL painting
'There is a painting hanging on the wall.'

b. *Yí-fù huà guà-le qiángshang.
one-CL painting hang-PER wall-top

(5) a. Zhāngsān zài qiángshang guà-le yí-fù huà.
Zhangsan at wall-top hang-PER one-CL painting
'Zhangsan has hung a painting on the wall.'

b. *Qiángshang zài/bǎ Zhāngsān guà-le yí-fù huà.
wall-top at/BA Zhangsan hang-PER one-CL painting

The above examples show that the determination of the subject from a number of arguments is not a random choice. In (3) and (4), the verb *guà* 'hang' has two arguments and it is the non-patient argument that serves as the subject. In (5), there are three arguments for the verb *guà*. Although the two non-patient aguments have each been subject in (3) and (4) when the other non-patient argument is absent, only *Zhāngsān* can be the subject in (5).[1] In this chapter I am going to show that the arguments of a verb are organized according to the ordering known as the obliqueness hierarchy. This obliqueness hierarchy of arguments is the direct reflection of the thematic role hierarchy.

This chapter is organized as follows: In section one I examine some of the claims made in the past about argument structures and compare them with Chinese data. In Section 2 I provide evidence for the existence of an obliqueness hierarchy in Chinese argument

[1] The following seems to be a counterexample to this claim.

(i) a. Qiángshang bèi Zhāngsān guà-le yí-fù huà.
wall-top BEI Zhangsan hang-PER one-CL painting
'Zhangsan has hung a painting on the wall.'

However, I will argue in later chapters that *bèi Zhāngsān* 'by Zhangsan' in (i) should not be treated as a marked complement within the VP. Instead, it is suggested to be a prepositional phrase and an adjunct modifier to the VP. That is, (i) will be argued to be a passive sentence related to (5a). See later chapters for arguments for this analysis.

structure. In Section 3 I show how this hierarchy determines some of the phrase structures we have discussed so far.

4.1. The Hierachical Argument Structure

The idea that arguments are hierarchically structured is not new in linguistics. Various proposals have been suggested in the literature. In this section I am going to review some of the widely discussed ones and their possible applications in Chinese syntax.

4.1.1. Keenan and Comrie (1977)'s Proposal

The earliest discussion on argument hierarchy that I know of is Keenan and Comrie 1977 (henceforth K&C), where, after investigating dozens of the world languages, they reached the conclusion that noun phrases in a sentence form an accessibility hierarchy so far as relativization is concerned. This accessibility hierarchy is formed in terms of grammatical relations and is shown as follows.

(6) Accessibility hierarchy (AH)

SU > DO > IO > OBL > GEN > OCOMP

The AH is intended to be universal in forming the strategy of NP relativizations. Together with some Hierarchy Constraints (HCs), conditions for NP relativizations that any grammar of a human language must meet are defined. According to K&C, if a language can relativize an IO (indirect object), it must be able to relativize DO (direct object) and SU (subject) as well. For example, K&C claims that in English the accessibility of NP relativization can go down the list to GEN (genitive). That is, except for the OCOMP (object of comparison), English allows all the (argument) NPs in a simplex sentence to be relativized.

(7) a. Relativization of the Subject :
The man who went to New York

b. Relativization of the Direct Object :
the book that I gave to the man

c. Relativization of the Indirect Object:
the man whom I gave the book to

d. Relativization of the Oblique NP :
the table that I put the book on

e. Relativization of the Genitive NP :
the man whose uncle I happen to know

f. Relativization of the Object of Comparison:[2]

[2] K&C also point out that the following sentence may be accepted by some English speakers.

*the magazines that I have more books than

K&C also examined the data from Li and Thompson (1974) and (1976) for support of their claim. According to K&C, Chinese allows all the argument NPs to be relativized and therefore can be an very important piece of evidence in supporting the claim. Here are some examples in Chinese that K&C might have used.

(8) a. Relativization of the Subject:
rènshi wǒ de nèi-ge rén
recognize I REL that-CL person
'the person who recognizes me'

b. Relativization of Direct Object:
wǒ gěi-le nǐ de nèi-ben shū
I give-PER you REL that-CL book
'the book that I have given you'

c. Relativization of the Indirect Object:
wǒ gěi-le ($tā_i$) yī-ben shū de nèi-ge $rén_i$
I give-PER he one-CL book REL that-CL person
'the person that I have given a book to'

d. Relativization of the Oblique NP:
wǒ (zài $nèir_i$) guà-le yī-fu huà de $qiángshàng_i$
I at there hang-PER one-CL painting REL wall-top
'the wall on which I have hung a painting'

e. Relativization of the genitive NP:
($tā_i$ de) xiàmiàn yà-le wǔ-kuai qián de nèi-ben $shū_i$
it DE under-side press-PER five-CL money REL that-CL book
'the book under which there are five dollars'

f. Relativization of the Object of Comparison:[3]
wǒ bǐ $tā_i$ gāo de nèi-ge $rén_i$
I compare he tall REL that-CL person
'the person that I am taller than'

With the above data K&C claim that Chinese also complies with the NP AH: since Chinese allows OCOMP, which is the lowest in the AH, to be relativized, other NP's must be allowed to be relativized. However, the data K&C quote do not tell the whole story about

(i) the man who Mary is taller than.
Since OCOMP is at the end of the AH, even for the people who accept (i) totally, this would not be a counterexample to K&C's claim. A similar sentence is given to me by Robert Levine.

(ii) There are people I can ran faster than.

[3] Pollard notes that in relativization of OCOMP in Chinese, the resumptive pronoun is obligatory. Consider the following.

(i) *wǒ gāo de nèi-ge rén.
I tall REL that-CL person

This might show that the OCOMP position is less accessible to relativization than other NPs in Chinese.

Chinese relativization. Consider the following data, which, we believe, raise some questions about their claim.

(9) a. Zhāngsān bǎ júzi bō-le pí.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the skin off the orange.'

b. *Zhāngsān bǎ júzi bō-le de pí.
Zhangsan BA orange peel-PER REL skin
Intended: 'the skin that Zhangsan peeled off the orange'

c. bǎ júzi bō-le pí de Zhāngsān
BA orange peel-PER skin REL Zhangsan
'Zhangsan who has peeled the skin off the orange'

d. Zhāngsān bō-le pí de júzi
Zhangsan peel-PER skin REL orange
'the orange that Zhangsan has peeled the skin off '

(10) a. Zhāngsān bǎ qiānbǐ fàngjìn-le shūbāo.
Zhangsan BA pencil put-into-PER bookbag
'Zhangsan has put the pencil into the bookbag.'

b. *Zhāngsān bǎ qiānbǐ fàngjìn-le de shūbāo.
Zhangsan BA pencil put-into-PER REL bookbag
Intended: 'the bookbag that Zhangsan has put the pencil into'

c. bǎ qiānbǐ fàngjìn-le shūbāo de Zhāngsān
BA pencil put-into-PER bookbag REL Zhangsan
'Zhangsan, who has put the pencil into the bookbag.'

d. Zhāngsān fàngjìn-le shūbāo de qiānbǐ
Zhangsan put-into-PER bookbag REL pencil
'the pencil that Zhangsan has put into the bookbag.'

(11) a. Zhāngsān zài shūbāoli fàng-le wǔ-zhi qiānbǐ.
Zhangsan ZAI bookbag-inside put-PER five-CL pencil
'Zhangsan has put five pencils into the bookbag.'

b. *Zhāngsān zài shūbāoli fàng-le de nèi wǔ-zhi qiānbǐ.
Zhangsan ZAI bookbag-inside put-PER REL that five-CL pencil
Intended: 'five pencils that Zhangsan has put into the bookbag.'

c. Zài shūbāoli fàng-le wǔ-zhi qiānbǐ de Zhāngsān.
ZAI bookbag-inside put-PER five-CL pencil REL Zhangsan
'Zhangsan, who has put five pencils into the bookbag.'

d. Zhāngsān fàng-le wǔ-zhi qiānbi de shūbāolǐ.
Zhangsan put-PER five-CL pencil REL bookbag-inside
'In the bookbag where Zhangsan has put five pencils.'

In (9), *pí* 'skin' is the unmarked complement (the object in traditional terms) and it cannot be relativized. Nor can the object NP *shūbāo* 'bookbag' in (10) or *wǔ-zhi qiānbǐ* 'five pencils' in (11). However, in (9)-(11) the subject and marked complements are relativizable. This shows that when accessibility to relativization is taken into consideration, the object should be the most reluctant element in the sentence to undergo the operation.

Thus, if we need to propose an AH for Chinese, it must be a different one than that in (6). It shoud be something like the following.

(12) Subject > Marked Complements > Unmarked Complements (= Object)

The hierarchy in (12) can also be confirmed by accessibility to topicalization in Chinese. As the following examples show, the object is also the most reluctant element in the sentence to undergo topicalization.

(13) a. Zhāngsān$_i$, tā$_i$ bǎ júzi bō-le pí.
Zhangsan he BA orange peel-PER skin
'As for Zhangsan, he has peeled the skin off the orange.'

b. Júzi$_i$, Zhāngsān (bǎ tā$_i$) bō-le pí.
orange Zhangsan BA it peel-PER skin
'As for the orange, Zhangsan has peeled its skin off.'

c. *Pí$_i$, Zhāngsān bǎ júzi bō-le (tā$_i$).
skin Zhangsan BA orange peel-PER it

(14) a. Zhāngsān$_i$, tā$_i$ bǎ qiānbǐ fàngjìn-le shūbāo.
Zhangsan he BA pencil put-into-PER bookbag
'As for Zhangsan, he has put the pencil into the bookbag.'

b. Qiānbǐ$_i$, Zhāngsān (bǎ tā$_i$) fàngjìn-le shūbāo.
pencil Zhangsan BA it put-into-PER bookbag
'As for the pencil, Zhangsan has put it into the bookbag.'

c. *Shūbāo$_i$, Zhāngsān bǎ qiānbǐ fàngjìn-le (tā$_i$).
bookbag Zhangsan BA pencil put-into-PER it

(15) a. Zhāngsān$_i$, tā$_i$ zài shūbāoli fàng-le wǔ-zhi qiānbǐ.
Zhangsan he ZAI bookbag-inside put-PER five-CL pencil
'As for Zhangsan, he has put five pencils into the bookbag.'

b. Shūbāoli, Zhāngsān fàng-le wǔ-zhi qiānbǐ.
bookbag-inside Zhangsan put-PER five-CL pencil
'in the bookbag Zhangsan has put five pencils.'

c. *Wǔ-zhi qiānbǐ, Zhāngsān zài shūbāoli fàng-le.
five-CL pencil Zhangsan ZAI bookbag-inside put-PER

It has also been noted in the literature (Gao 1989) that Chinese generally does not allow unmarked complements to undergo focussing with *shì* while other parts of the sentence are always available for such structure.

(16) a. Shì Zhāngsān bǎ júzi bō-le pí.
is Zhangsan BA orange peel-PER skin
'it is Zhangsan who has peeled the skin off the orange.'

b. Zhāngsān shì bǎ júzi bō-le pí.
Zhangsan is BA orange peel-PER skin
'It is the orange that Zhangsan has peeled the skin.'

c. *Zhāngsān bǎ júzi bō-le shì pí.
Zhangsan BA orange peel-PER is skin
Intended: 'it is the skin that Zhangsan has peeled off the orange.'

(17) a. Shì Zhāngsān bǎ qiānbǐ fàngjǐn-le shūbāo.
is Zhangsan BA pencil put-into-PER bookbag
'It is Zhangsan who has put the pencil into the bookbag.'

b. Zhāngsān shì bǎ qiānbǐ fàngjǐn-le shūbāo.
Zhangsan is BA pencil put-into-PER bookbag
'It is the pencil that Zhangsan has put into the bookbag.'

c. *Zhāngsān bǎ qiānbǐ fàngjǐn-le shì shūbāo.
Zhangsan BA pencil put-into-PER is bookbag
Intended: 'it is the bookbag that Zhangsan has put the pencil into.'

Thus, I conclude this section with the claim that the AH in (12) is the correct argument hierarchy for Chinese.

4.1.2. Pollard and Sag 1992

The need for an argument hierarchy has further syntactic motivation. It has been argued in Pollard and Sag 1992 (henceforth P&S 1992) that Principle A of the Binding Theory needs to be revised to make reference to o-command relation (rather than the c-command relation).

In an account of English grammar within the framework of Government and Binding theory (GB), Principle A (Chomsky 1981, 1986a) is used to account for the occurrences of anaphors in the the following sentences. It requires that in English a governed anaphor must have a coindexed, c-commanding antecedent NP within the same sentence.

(18) a. John$_i$ admires himself$_i$.
b. The students$_i$ met each other$_i$.
c. Mary$_i$ explained Doris$_j$ to herself$_{i/j}$.
d. Larry$_i$ knows that John$_j$ admires himself$_{*i/j}$.
e. The teachers$_i$ wondered whether the students$_j$ met each other$_{*i/j}$.

However, the following examples are not explained by Principle A.

(19) a. The picture of himself$_i$ in the museum bothered John$_i$.
b. Mary talked to John$_i$ about himself$_i$.

In (19) neither of the anaphors is c-commanded by its antecedent, thus Principle A fails to account for the behavior of all anaphors in English. To save Principle A, P&S suggest that o-command, instead of c-command, should be employed in Principle A.

The idea of o-command comes from the observation that there is an argument hierarchy in every sentence which is relevant to anaphoric binding. P&S summarize the hierarchy on the basis of argument obliqueness (hence o-command) as has been discussed in the literature (the relational hierarchy in Relational Grammar of Perlmutter and Postal (1977, 1984), the relativization accesibility hierarchy of Keenan and Comrie (1977), and the

hierarchy of grammatical relations in Categorial Grammar (Dowty 1982)). The obliqueness hierarchy is sketched below.

(20) Subj > Primary Obj > Secondary Obj > Other Complements

The essence of (20) is the ordering by obliqueness of the arguments with the subject as the least oblique one because Principle A with o-command requires that an anaphor be coindexed with a less oblique coargument if there is one. Since subject is always the least oblique argument, Principle A with o-command basically covers all the cases that Principle A with c-command is designed for, such as the examples in (18). As for the examples in (19), the anaphor in the complex NP in (19a) is considered an exempt anaphor. There is no less oblique coargument, so the interpretation of the r-pronoun is determined by pragmatic factors. In (19b), *to John* is considered less oblique (higher in the hierarchy) than *about himself* and therefore can bind the latter. Thus Principle A with o-command solves the problem that Principle A with c-command cannot. This is another piece of evidence that supports the hierarchical argument structure in languages. Note that the obliqueness hierarchy in P&S resembles the NP accessibility hierarchy in K&C 1977.

Now let's turn to Chinese. As has been seen in the previous section, the hierarchy of arguments in Chinese is somewhat different than that in English. At one end along the obliqueness continum in Chinese is the subject while at the other end we see the direct object, as is shown in the following.

(21) Subject > Marked Complements > Unmarked Complement (= Object)

If (21) is indeed the correct argument hierarchy for Chinese, with the understanding that Principle A with o-command works in Chinese (P&S 1992), we should expect that anaphors in the marked complements are always bound by the subject and not by the unmarked complements. We should also expect that the local anaphors in the unmarked complements be bound by the marked complements and the subject as well. The following examples show that this is a correct prediction.

(22) a. Zhāngsān$_i$ bǎ Lǐsǐ$_j$ jièshàogei tāzìji$_{i/j}$.
Zhangsan BA Lisi introduce-to himself
'Zhangsan introduced Lisi to himself.'

b. Zhāngsān$_i$ ba tāzìji$_{i/*j}$ jièshàogei Lǐsǐ$_j$.
Zhangsan BA himself introduce-to Lisi
'Zhangsan introduced Lisi to himself.'

One should note that Principle A with c-command makes the wrong prediction for the examples in (22). In the traditional analysis where *bǎ* is treated as a preposition, *bǎ Lǐsi* does not c-command *tāzìji*, a local reflexive pronoun, and therefore (22a) cannot be explained. With our analysis where *bǎ* is treated as a marker and a flat VP structure is

assumed, *bǎ tāzǐji* and *Lǐsǐ* c-command each other in (22b) and therefore their disjoint reference cannot be explained. The following are more examples like (22).

(23) a. Lǐ Xiǎojie$_i$ gěi Wáng Xiānseng$_j$ miáoshù tāzǐji$_{i/j}$.
Li Miss for Wang Mister describe him/herself
'Ms Li describes herself for Mr Wang/Mr Wang for himself.'

b. Lǐ Xiǎojie$_i$ gěi tāzǐji$_{i/*j}$ miáoshù Wáng Xiānseng$_j$.
Li Miss for him/herself describe Wang Mister
'Ms Li describes Mr Wang for herself.'

4.1.3. Proto-Roles in Chinese

A somewhat different argument hierarchy is discussed in Dowty (1991), where it is argued that the subject of a sentence is not chosen randomly. It is determined by the number of properties a certain argument, among a set of arguments associated with the verb of the sentence, may have. For an argument to become the subject of the sentence, it should possess the greatest number of proto-agent properties. According to Dowty, there are five proto-agent properties: volition, sentience, causation, movement, and independent existence. Each argument of the verb may have one or more of these properties but only the one that has the most may eventually be selected to be the subject of the sentence.[4] The object of a sentence, on the other hand, is determined by the number of proto-patient properties an argument has. The proto-patient properties are change of state, incremental theme, being causally affected, being stationary relative to another participant, and existence not independent of event.

This proto-role proposal now can be seen to give detailed explanations of classic examples in Case theory (Fillmore 1968, 1977), as are shown in the following.

(24) a. John opened that door with this key.
b. This key opened that door (*by John).
c. *That door opens with this key.

In (24) there are three arguments to choose from for the selection of the object and subject in the sentence. The NP *the door* possesses the most proto-patient properties and therefore becomes the object. Between the agent *John* and the instrument *the key*, *John* has the greater number of proto-agent properties (volition, sentience, causation, indendent existence) and therefore must be selected for the subject. The unacceptability of (24b) shows the wrong selection of the subject. However, when the agent NP *John* is absent, the instrument NP *the key* is the argument that has the most proto-agent properties and in this

[4] In a passive sentence, the most agent-like argument is not lexically realized (surpressed according to relational grammar), and therefore is not on the SUBCAT list, thus does not participate in the argument selection.

case, *the key* can also be selected as the subject. The unacceptability of (24c) shows that the door cannot be selected as the subject in the presence of a more proto-agent-like argument.

The case is specially interesting when the instrument NP *the key* is also absent from (24). Since English is a subject oriented language, that is, it does not allow a sentence without a subject, the subject has to be filled with the highest ranked themantic role first. Then, when there is only one argument for the verb *open*, as is the case of (25), that argument *that door* must be selected as the subject of the sentence.

(25) That door opens easily.

Thus, what the proto-role proposal does is to take the set of lexically realized arguments associated with a verb and put them into an ordered set. The proto-agent properties, in the above case, arrange the three arguments of the verb *open* into an ordered list such that the agent NP *John* is at the top of the list so far as selecting subject is concerned.

We can well imagine that in languages where a number of lexically realized arguments are associated with a transitive verb, in order to form a sentence, we need to choose the most agent-like of the realized arguments for the subject and most patient-like of the realized arguments for the object. As we have seen in Dowty's descriptions, proto-agent and proto-patient have very different properties and some of them are even of the opposite values. For example, for the 'causation' of proto-agent, we have 'being causally affected' for the proto-patient role; for 'independent existence' of proto-agent, we have 'existence not independent of event' for the proto-patient. Thus, for a transitive verb that has more than two arguments, it is highly unlikely that two arguments will possess the same number of properties of both proto-roles.[5] Instead, it may well be expected that the two sets of proto-role properties arange the arguments into a hierarchy and the two on each end of the hierarchy will be selected to fulfil the two proto-roles. If this is true, we can expect the following role hierarchy.

(26) Agent > Other Roles > Patient

Let us now turn to Chinese. We have seen sentences with four argument NPs such as the following.

(27) a. Zhāngsān kěyi zài fànguǎnli yòng kuàizi chī fàn.
Zhangsan may at restaurant-inside use chopsticks eat meal
'Zhangsan may eat his meal with chopsticks in a restaurant.'

b. *Fànguǎnli kěyi bèi Zhāngsān yòng kuàizi chī fàn.
restaurant-inside may by Zhangsan use chopsticks eat meal

c. *Kuàizi kěyi zài fànguǎnli bèi Zhāngsān chī fàn.
chopsticks may at restaurant-inside by Zhangsan eat meal

[5] When this does happen, as is pointed out in Dowty (1989) to be argument selection indeterminacy cases, either argument can be the subject or object, depending on pragmatic factors.

In (27), there are four argument NPs: *Zhangsan*, *fànguǎnli* 'in a restaurant', *kuàizi* 'chopsticks', and *fàn* 'meal', and *chī* 'eat' is a transitive verb, which means that it needs a subject and an object. Among the four NPs, *Zhangsan* possesses the most proto-agent properties (volition and sentience) and therefore is selected for the subject. the NP *fàn* 'meal' has the most patient properties (change of state, causally affected, and existence not independent of event) and therefore is chosen to be the object (the unmarked complement). This is the required arrangement of the four arguments and gives the grammatical sentence in (27a). Any other arrangement would yield unacceptable sentences, as is shown in (27b-c).

Note that the unacceptibility of (27b) does not mean that the location NP *fànguǎnli* 'in restaurant' can never be chosen as the subject. It only means that when there is an argument that has more proto-agent properties, such as the agent NP *Zhangsan*, the location NP cannot be chosen as the subject, because the location NP is less agent-like than the agent NP in the argument hierarchy. One way to make the location NP the most agent-like argument is to drop any that are higher than it in the hierarchy. In the above case, it is to get rid of *Zhangsan*. That is, if *Zhangsan* is absent (lexically not realized), then we should expect the locational NP *fànguǎnli* 'in a restaurant' to be chosen as the subject since without the agent NP, the location NP has the most proto-agent properties (existence independently of the event). The following examples show that this is indeed the case.[6]

(28) a. Fànguǎnli kěyi yòng kuàizi chī fàn.
restaurant-inside may use chopsticks eat meal
'In a restaurant, (someone) may eat his meal with chopsticks.'

[6] As Bob Levine points out, these examples show that Chinese seems to demonstrate a textbook example of Dowty's proto-role. However, the following seems to serve as counterexamples.

(i) Nèi-guo fàn kěyi chī sān-ge rén.
that-CL rice can eat three-CL person
'The pot of rice can feed three people.'

As the translation show, the verb *chī* in (i) has different interpretation than the one used in (28)-(32). Thus we should expect it to be a different verb. Besides, *sān-ge rén* may be treated as a measure phrase (See Gao 1994 for discussion), not a real NP and therefore does not carry the proto-agent properties. Consider the following.

(ii) *Nèi-guo fàn kěyi chī zhè-ge rén/Zhāngsān.
that-CL rice can eat this-CL person/Zhangsan

All these considered. (i) may not be a counterexample.

b. ??Kuàizi kěyi zài fànguǎnli chī fàn.
chopsticks may at restaurant-inside eat meal
'With chopsticks, (someone) may eat his meal in a restaurant .'

Although with the location NP present it is awkward for the instrument NP to be chosen as the subject, *kuàizi* '(with) chopsticks' as the suject is fully acceptable when *fànguǎnli* 'in a restaurant' is absent. This is shown in (29) bellow.

(29) a. Kuàizi kěyi chī fàn.
chopsticks may eat meal
'(Someone) may eat his meal with chopsticks.'

b. Fànguǎnli kěyi chī fàn.
restaurant-inside may eat meal
'(Someone) may eat his meal in a restaurant.'

Thus, with these examples we see that it is indeed the case that the set of the proto-agent properties arranges the arguments into a hierarchy. While the proto-agent properties are working on one side of the hierarchy, the set of proto-patient properties is also working on the other side of the hierarchy. Let's examine the following examples.

(30) a. Zhāngsān tiāntian zài fànguǎn yòng kuàizi chī fàn.
Zhangsan day-day at restaurant use chopsticks eat meal
'Zhangsan eats his meal with chopsticks in a restaurant everyday'

b. *Zhāngsān tiāntian zài fànguǎn bǎ fàn chī kuàizi.
Zhangsan day-day at restaurant BA meal eat chopsticks

c. *Zhāngsān tiāntian bǎ fàn yòng kuàizi chī fànguǎn.
Zhangsan day-day BA meal use chopsticks eat restaurant

Part of the reason for the unacceptibility of (27b-c) is that of the four argument NPs, *fàn* 'meal' has the most proto-patient properties and therefore with it present, no other NP can be chosen as the object. Recall that the selection of an object, just like the selection of a subject, is to use the set of proto-patient properties to arrange the arguments into a hierarchy and the argument that has the most proto-patient properties must be chosen as the object. If this is true, then there should always be a most patient-like argument when the verb needs an object. In (30), *fàn* 'meal' possesses the most proto-patient properties and thus qualifies as the choice for the object. But what if *fàn* 'meal' is missing (lexically not realized) and the *chī* 'eat' still demands a syntactic object? According this analysis, the answer should be to find an argument that has the next most proto-patient properties and make it the object. In our case, the next in line on the hierarchy is the instrument NP *kuàizi* 'chopsticks' (which has the proto-patient properties of change of position). Thus, if we drop the patient NP *fàn* 'meal' in (30), we should expect *kuàizi* 'chopsticks' to fill the object[7] position. This prediction is borne out in the following examples.

[7] Here the term *object* is used as a syntactic notion. It may not be the same as Dowty (1989)'s notion of *object*.

(31) a. Zhāngsān tiāntian zài fànguǎn chī kuàizi.
Zhangsan day-day at restaurant eat chopsticks
'Zhangsan eats with chopsticks in a restaurant everyday'

b. *Zhāngsān tiāntian yòng kuàizi chī fànguǎn.
Zhangsan day-day use chopsticks eat restaurant
Intended: 'Zhangsan eats with chopsticks in a restaurant everyday'

In this analysis, the location NP (which has the proto-patient properties of being stationary relative to another participant) can serve as the object only when the instrument NP is also missing. This is, again, confirmed by the following examples.

(32) a. Zhāngsān tiāntian chī fànguǎn.
Zhangsan day-day eat restaurant
'Zhangsan eats in a restaurant everyday.'

b. Zhāngsān tiāntian chī kuàizi.
Zhangsan day-day eat chopsticks
'Zhangsan eats with chopsticks everyday.'

The above facts are consistent with the assumption that there is a thematic hierarchy in Chinese and it is arranged by the proto-role properties. This hierarchy is basically the same as the English one in (26), repeated here as (33).

(33) Most Agent-like > Other Roles > Most Patient-like

Since the most agent-like argument generally serves as the subject and the most patient-like argument is always chosen for the object (the unmarked complement in Chinese), the thematic role hierarchy directly reflects the obliqueness hierarchy discussed in previous sections.

4.2. Linear Order

In previous sections I have shown that there is an argument hierarchy in Chinese with the most agent-like argument on one side and the most patient-like argument on the other side. It seems obvious that there is a corelation between the argument hierachy and the linear order of the sentential elements. In the next few sections I am going to consider some specific issues in Chinese grammar and show how the proposed hierarchy predicts linear order of the phrase structures. I will also show that some other syntactic phenomena also support the proposed hierarchy.

4.2.1. The Split Object

Consider the following examples.

(35) a. Zhāngsān gěi wǒ nálái-le yī-gè píngguǒ.
Zhangsan for me take-come-PER one-CL apple
'Zhangsan has taken an apple for me.'

b. Zhāngsān bǎ píngguǒ gěi wǒ nálái-le yī-gè.
Zhangsan BA apple for me take-come-PER one-CL
'Zhangsan has taken one of the apples for me.'

(36) a. Zhāngsān dǎduàn-le Lǐsǐ de yī-tiáo tuǐ.
Zhangsan hit-break-PER Lisi DE one-CL leg
'Zhangsan has broken Lisi's one leg.'

b. Zhāngsān bǎ Lǐsǐ dǎduàn-le yī-tiáo tuǐ.
Zhangsan BA Lisi hit-break-PER one-CL leg
'Zhangsan has broken one of Lisi's leg.'

In the above two sets of examples, there is something in common. That is, in both the (a) examples there is only one unmarked complement (or object) and this object seems to be then split into two parts in the (b) examples with one part as a marked complement in preverbal position: in (35a), the object is *yī-gè píngguǒ* 'one apple', and in (35b), the object is *yīgè* 'one' and *píngguǒ* 'apple' becomes *bǎ píngguǒ* and appears before the verb *nālái-le*. In (36a), the object is *Lǐsǐ de yī-tiáo tuǐ* 'Lisi's one leg', and in (36b), the object is *yī-tiáo tuǐ* 'one leg', and *Lǐsǐ de* 'Lisi's' become *bǎ Lǐsǐ* and appears before the verb *dǎ-duàn-le*. This is what we know as the split object phenomenon in Chinese.

However, the two sets are also different from each other in what is split out of the object. In (35) it is the head noun *píngguǒ* 'apple' that is missing in the object in the (b) sentence while in (36) it is the modifying phrase *Lǐsǐ de* 'Lisi's' that is missing in the object in the (b) sentence. Thus they may need different explanations and analyses and I will deal with them separately.

4.2.1.1. The Whole-Part Relation

Now we take another look at (35). In (35), the (b) sentence is different from the (a) sentence only in that *yī-gè píngguǒ* in (a) appears to be split in two in (b) with *píngguǒ* in preverbal position and *yī-gè* remaining in postverbal position. That is, the head noun in the object in (a) seems to be relocated to the preverbal position in (b). However, as the marker *bǎ* indicates, the preverbal position is a full phrase position, known as the marked complement, that has been discussed in previous chapters. So this seemingly object splitting is theoretically problematic. In the past, especially within the framework of Government and Binding Theory (GB), linguists have noticed that certain parts of a constituent may be moved to a different location, but restrictions apply. For instance, so-

called Head-movement requires that the head of a constituent must move to join the head of another constituent, such as the well-known V-to-I (or in some version of the theory, the I-to-V) movement (Pollock 1989, Chomsky 1991). Other movements require that a full projection move to another location for a full projection, such as WH-movement and topicalization (Xu and Langendoen 1985, Koopman and Sportische 1985, Kitagawa 1986, Speas 1990). In our case, we find that the head of a NP is relocated to a full phrase position and this is prohibited in syntactic theories of movement.

Empirically, the object-splitting analysis is challenged by the fact that the truth conditions of the pairs of sentences in (35) and (36) are different. The (a) sentence is understood to mean that there was an apple and Zhangsan took it to me while the (b) sentence says that there were some apples and Zhangsan took one of them to me. The different truth conditions suggest that (b) is not the result of splitting the object of (a). In fact, there is evidence that *píngguǒ* in (b) is not only a head noun. It is a full NP. Examine the following.

(37) a. Zhāngsān názǒu-le sān-gè píngguǒ.
Zhangsan take-go-PER three-CL apple
'Zhangsan has taken away three apples.'

b. Zhāngsān bǎ píngguǒ názǒu-le sān-gè.
Zhangsan BA apple take-come-PER three-CL
'Zhangsan has taken away three of the apples.'

c. Zhāngsān bǎ wǔ-gè píngguǒ názǒu-le sān-gè.
Zhangsan BA five-CL apple take-come-PER three-CL
'Zhangsan has taken away three of the five apples.'

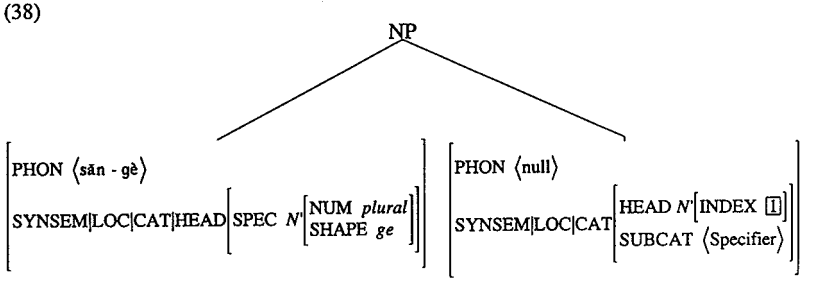
d. *Zhāngsān názǒu-le sān-gè wǔ-gè píngguǒ.
Zhangsan take-come-PER three-CL five-CL apple

In (37), the (a) and (b) sentences seem to display the split object phenomenon, with the object *sān-gè píngguǒ* 'three apples' in (a) splitting into preverbal *píngguǒ* 'apples' and postverbal *sān-gè* 'three (apples)' in (b). However, the marker *bǎ* before *píngguǒ* indicates that the preverbal *píngguǒ* 'apples' must be treated as a full phrase and this is confirmed by (c) where the preverbal *píngguǒ* 'apples' is freely expanded with a specifier *wǔ-gè* 'five (apples)'. When we put *wǔ-gè píngguǒ* 'five apples' back into postverbal object position, the result is the unacceptable (d). This is because*wǔ-gè píngguǒ* 'five apples' is already a full NP with its specifier position saturated and adding another specifier to it is not allowed in Chinese NP structure (Gao 1994). This shows that split NP is not the correct analysis for this kind of sentence in Chinese.

I have shown that the preverbal element after *bǎ* is a full NP and this NP forms a marked complement with the marker *bǎ*. Likewise, the postverbal element must also be a

full NP, since only full NPs occupy object positions. It might be thought that the numeral-classifier combination functions as a pronoun; however, such an analysis was shown to be untenable in Chinese (See Chapter 2 for arguments). Another possible analysis is along the line of a null head (pro') as discussed in Chapter 2. In this analysis, the numeral-classifier combination is still the specifier of the noun phrase and it agrees with the head of the noun phrase which is phonologically unrealized and may be coindexed with the head of an o-commanding NP within the sentence. In the case above, the object in (37b) and (37c) would be an NP shown as the following.

(38)



With the structure of *sān-gè* in (38), the structures of (37b) and (37c) are given as (39b) and (39c) below, respectively.

(39) a Zhāngsān názǒu-le [sān-gè[píngguǒ]$_{N'}$]$_{NP}$.
Zhangsan take-away-PER three-CL
'Zhangsan took three of the apples away.'

b Zhāngsān bǎ [[píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA apple take-away-PER three-CL
'Zhangsan took three of the apples away.'

c Zhāngsān bǎ [wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA five-CL apple take-away-PER three-CL
'Zhangsan took away three of the five apples.'

With the analysis in (39), now it is understood that the difference between (37a) and (37b) is no longer a split-NP problem, but a valence change. (37) shows that the verb *názǒule* 'take away' has a valence of two in (a) while the same verb has a valence of three in (b). Since the verb can only take one unmarked complement, the third argument would have to be realized as a marked complement and hence in a preverbal position.

When I say that valence change is the explanation of the set of sentences in (39), there is still one more question to be asked. That is, why do the three arguments in (39c) have to be arranged in this way, while (39d) is not acceptable?

(39) d *Zhāngsān bǎ [sān-gè [píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [wǔ-gè[pro'$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA three-CL apple take-away-PER five-CL

The traditional aproach towards the fixed argument arrangement in (39c) is to have a constraint on argument structures in Chinese. In Thompson (1984), it was stated that if two arguments bare the relation of whole and part, the argument denoting wholeness should always precede the argument that denotes part. This constraint certainly can explain the contrast between (39c) and (39d): In (39c), *wǔ-ge píngguǒ* 'five apples' is the total of apples we have and this certainly can count as the whole. The postverbal NP is *sān-ge* 'three (apples)' and we must understand that the three apples are part of the five apples in the total. Thus the whole is placed before the part and the constraint is satisfied in (39c). In (39d), on the other hand, the NP denoting the part *sān-ge píngguo* 'three apples' is placed before the whole-denoting NP *wǔ-ge* 'five (apples)' and thus violates the constraint. The result is an unacceptable sentence.

Based on the above discussion, I would like to make the following amendment to the proto-patient properties proposed in Dowty (1989) with special reference to Chinese.

(40) Being a part, as opposed to being a whole, is a property of a proto-patient role.

With the assumption of (40), (39) can be explained under the current analysis: (39b-c), compared to (39a), have a valence increase[8] from two to three, creating a part-whole relation between the two complements. According to (40), the argument denoting part is more patient like than the argument denoting the whole and therefore must be selected as the unmarked complement. (39d) violates the argument selection principle and therefore is unacceptable. It must be noted that without the part-denoting argument *sān-ge* 'three (apples)', the whole denoting argument can function as the unmarked complement. This is shown in the following.

(41) b. Zhāngsān **názǒu-le** [[píngguǒ$_i$]$_{N'}$]$_{NP}$.
Zhangsan take-away-PER apple
'Zhangsan took the apples away.'

c. Zhāngsān **názǒu-le** [wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$.
Zhangsan take-away-PER five-CL apple
'Zhangsan took away three of the five apples.'

Please also note that when the most agent-like argument (in (39b-c) is absent, the less-patient like of the two complements can be selected as the subject, comfirming the arguement selection principle. Examine the following.

(42) b. [[Píngguǒ$_i$]$_{N'}$]$_{NP}$ **názǒu-le** [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
apple take-away-PER three-CL
'Three of the apples were taken away.'

[8] The addition of arguments (valence increase) may be made through a rule similar to the topic addition lexical rule, subject to a similar constraint that the added argument must bare *whole-part* or *ground-figure* relation with the rest of structure.

c. [Wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$ **názǒu-le** [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
five-CL apple take-away-PER three-CL
'Three of the five apples were taken away.'

Some other attempts have been made in recent literature to explain the word order in (39). For instance, Gao (1993) states that a *bǎ*-phrase is a kind of adverbial prepositional phrase that modifies the verb phrase and therefore needs to be placed before the verb. But this still cannot explain why (39d) is not acceptable. In Huang (1991), it is argued that some prepositional phrases may form a different kind of argument than the NP arguments in Chinese. These are called applied arguments[9]. For instance, in the sentence of (39c), *sān-ge* 'three (apples)' and *wǔ-ge píngguǒ* 'five apples' are both considered themes. Since *bǎ* appears before *wǔ-ge píngguǒ* it is now the applied theme. In the argument hierarchy Huang has argued for, applied theme ranks higher than the theme and hence *wǔ-ge píngguǒ* appears in the sentence before *sān-ge*. However, as is the problem in other analyses, this still fails to explain the unacceptability of (39d) where, instead of *wǔ-ge píngguǒ* 'five apples', *sān-ge píngguǒ* 'three apples' is the applied theme.

The problem for these recent proposals is that they rely too heavily on the so called prepositions such as *bǎ*. For instance, in Huang's analysis, it seems that the only thing that determines the difference between the theme and the applied theme is the word *bǎ*. Recall that in Chapter 3, I have shown clearly that in Chinese these so-called prepositions are no more than case markers. They do not have any semantic content and they do not change the syntactic categories of the arguments. Thus the difference between the marked argument *bǎ wǔ-ge píngguǒ* and the unmarked argument *sān-ge* must be determined by the relationship these two arguments have with the verb that subcategorizes for them. For example, the semantics of the verb *názǒu* 'take away' in (39a) is that for some y, y a person named Zhangsan, there are three x, x an apple, such that y takes away x. The extra argument that we find in (39b-c) has generally been interpreted as the affected theme (see Gao 1993). Thus the semantics of *názǒu* in these sentences is that for some y, there are some z and some x that are part of those z, such that y's taking away x affects z,. For those analyses that attribute the affected theme to the word *bǎ*, the historic use of *bǎ* is always quoted as to mean 'hold something and do something to it' (Li and Thompson 1981). That is, the historic use of *bǎ* as a verb has a meaning similar to the so-called preposition *bǎ* in contemporary Chinese and therefore it is the word *bǎ* that turns an argument into an affected theme. However, this line of analysis is challenged by the following data.

[9] Bresnan (1994) has made the same proposal for other languages.

(43) a. Wǔ-gè píngguǒ Zhāngsān názǒu-le sān-gè.
five-CL apple Zhangsan take-come-PER three-CL
'As for the five apples, Zhangsan has taken away three of them.'

b. Wǔ-gè píngguǒ Zhāngsān bǎ sān-ge názǒu-le.
five-CL apple Zhangsan BA three-CL take-come-PER
'As for the five apples, Zhangsan has taken away three of them.'

As (43a) shows, when *wǔ-ge píngguǒ* 'five apples' is topicalized (or placed in the topic position), no word such as *bǎ* is needed. But the sentence still treats *wǔ-ge píngguo* as the partially affected theme. This is because, as I have argued in Chapter 3, the word *bǎ* is only one of the markers in Chinese that are used when the complements of a verb do not appear postverbally. They are purely syntactic devices and do not contribute semantically to the arguments they mark. This is even more clearly shown in (43b), where, instead of *wǔ-ge píngguǒ*, the whole, *sān-ge*, the part, is placed preverbally and preceded by the word *bǎ*. As the translation shows, although *bǎ* indicates that *sān-ge* i is a totally affected theme, *wǔ-ge píngguǒ* is still the partially affected theme even when it is not marked by *bǎ*. Thus, it is shown that *bǎ* does not change the semantics of an argument, as we have shown in Chapter 3. Thus the applied theme analysis of *bǎ* fails to explain the arrangement of the arguments in (39).

However, this phenomenon is readily explained if we assume that the set of arguments is hierarchically sturctured according to the proto-role properties.

4.2.1.2. The Inalienable Object

Another set of sentences we need to look at shows the so-called inalienable object phenomenon in Chinese.

(44) a. Zhāngsān bō-le [júzi de pí]NP.
Zhangsan peel-PER orange DE skin
'Zhangsan has peeled the skin of the orange.'

b. Zhāngsān bǎ [júzi de pí]NP bō-le.
Zhangsan BA orange DE skin peel-PER
'Zhangsan has peeled the skin off the orange.'

c. Zhāngsān bǎ [júzí]NP bō-le [pí]NP.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the skin off the orange.'

(45) a. Lǐsi shuāiduàn-le [dèngzi de yǐtiáo tuǐ]NP.
Lisi throw-break-PER stool DE one-CL leg
'Lisi has broken one of the stool's legs.'

b. Lǐsi bǎ [dèngzi de yǐtiáo tuí]NP shuāiduàn-lě.
Lisi BA stool DE one-CL leg throw-break-PER
'Lisi has broken one of the stool's legs.'

c. Lǐsi bǎ [dèngzí]NP shuāiduàn-le [yǐtiáo tuǐ]NP.
Lisi BA stool throw-break-PER one-CL leg
'Lisi has broken one of the stool's legs.'

A closer look at these sentences reveals some unique properties. First, the verb in each set of sentences has no morphological change. The only change in the verb is the number of arguments it has. Thus these examples show that the verbs *bō-le* and *shuāiduàn-le* may have a valence of three or two. The (a) and (b) sentences show simple valence alternations as discussed in the previous chapters and the (c) sentences show that the same verb can have an extra argument. Second, the relation between the preverbal argument and the postverbal argument in (c) is still a whole-part one. However the whole-part relation here is different from the one discussed in the previous section in that it is restricted to a physical one. That is, the extra argument in (c) must denote a physical part of the postverbal complement in (a) or the preverbal complement in (b). This property severely restricts the productivity of the verb. As the following shows, any other relation between them results in unacceptability of the sentences.

(46) a. Tǔfěi shāsǐ-le Zhāngsān de fùqin.
Bandits kill-die-PER Zhangsan DE father
'The bandits have killed Zhangsan's father.'

b. Tǔfěi bǎ Zhāngsān de fùqin shāsǐ-le.
Bandits BA Zhangsan DE father kill-die-PER
'The bandits have killed Zhangsan's father.'

c. *Tǔfěi bǎ Zhāngsān shāsǐ-le fùqin.
Bandits BA Zhangsan kill-die-PER father

(47) a. Lǐsi jièzoǔ-le wǒ de yìběn shū.
Lisi borrow-go-PER I DE one-CL book
'Lisi has borrowed a book from me.'

b. Lǐsi bǎ wǒ de yìběn shū jièzoǔ-le.
Lisi BA I DE one-CL book borrow-go-PER
'Lisi has borrowed a book from me.'

c. *Lǐsi bǎ wǒ jièzoǔ-le yìběn shū.
Lisi BA I borrow-go-PER one-CL book

Thus (46c) is not acceptable because Zhangsan's father is not physically a part of Zhangsan and (47c) is not acceptable because the book is not physically a part of *wǒ* 'me'. This very restricted production of sentences raises very serious questions for any transformational analysis of the problem. It seems that the most tenable solution has to come from the valence alternation of the verbs, where the similarities of the sentences in each set is linked to the different valence capacities the verb may have in producing those sentences.

Third, there is a syntactic difference in those sentences from the examples seen in the previous section. Here the preverbal complement in (c) is the same as the adjunct modifier

(See Gao 1994 for discussion) in the postverbal complement in (a). Thus any analysis of extraction is theoretically ruled out because it would involve extraction of an adjunct to an argument position. Even though one might argue for an argument treatment of the modifier *Zhāngsān de* or *wǒ de*, the disappearance of the particle *de* after the extraction is still a big challenge for the analysis.

However, all this causes no difficulties in the analysis using valence change. Instead, these facts seem to support the present approach. This is especially true when we look at the whole-part relations between the preverbal argument, that is, the *bǎ*-phrase, and the postverbal argument. As was discussed in the previous section, the arrangement of the arguments in a sentence is based on the argument hierarchy of the verb. That is, when there is a choice of arguments to fill a single post-verbal object position, the most patient-like argument will be chosen. In the case of (44c) *júzi* and *pí* are both possible choices for the postverbal position, as is shown in the following examples.

(48) a. Zhāngsān bō-le yí-ge júzi.
Zhangsan peel-PER one-CL orange
'Zhangsan has peeled an orange.'

b. Zhāngsān bǎ nèi-ge júzi bō-le pí.
Zhangsan BA that-CL orange peel-PER skin
'Zhangsan has peeled the skin off the orange.'

c. *Zhāngsān bǎ pí bō-le yí-ge júzi.
Zhangsan BA skin peel-PER one-CL orange

However, (48) shows that postverbal *júzi* 'orange'is possible only in the absence of *pí* '(orange) shell'. This is predicted with the present analysis: Of the three arguments of the the verb *bō-le*, *pí* is the most patient-like (change of state, being causally affected, existence not independent of event, being part of a whole, and possibly incremental theme) in the argument hierarchy and *Zhangsan* is the most agent-like (volition, sentience, and causation). Thus with all three arguments present, only *pí* can serve as the postverbal complement. However, when *pí* is absent, as is the case of (48a), *júzi* becomes the most patient-like argument and hence is found in the postverbal complement position.

4.2.2. The Figure-Ground Relation

Some verbs may have two complements such that the objects denoted by the complement phrases are put close together during the action denoted by the verb. In many of these cases, the argument that denotes the larger object is referred to as the GROUND and the the

one denotes a smaller object as the FIGURE.[10] The following examples show that the two complements in each sentence have the FIGURE-GROUND relation. (Talmy 1985)

(49) a. Tā bǎ zhuōzishàng bǎi-le yi-duo huā.
he BA table-top place-PER one-CL flower
'He placed a flower on the table.'

b. *Tā bǎ yi-duo huā bǎi-le zhuōzishàng.
he BA one-CL flower place-PER table-top

(50) a. Tā bǎ shūjià bǎi-le jǐ-ben zǐdiǎn.
he BA bookshelf place-PER several-CL dictionary
'He has placed a few dictionaries on the bookshelf.'

b. *Tā bǎ jǐ-ben zǐdiǎn bǎi-le shūjià.
he BA several-CL dictionary place-PER bookshelf

It has been argued in the literature that in Chinese a *bǎ*-phrase generally denotes the GROUND. It sets the base (like a secondary topic in the sense of Tsao 1987 and Gao 1991) for later discussion. Thus in (49) only *zhuōzishàng* 'on the table' can function as the GROUND while *yi-duo huā* 'a flower', a smaller object compared to the GROUND, has to be the FIGURE. And the same is true of (50), where only *shūjià* 'the bookshelf' can be the GROUND and therefore *jǐ-ben zǐdiǎn* 'a few dictionaries' must be treated as the unmarked postverbal complement. This can be explained in the same way in the present approach, if we add the following to the list of proto-patient properties.

(51) Being a FIGURE, as compared to being a GROUND, is a property of a proto-patient role.

With (51), now we can explain (49) and (50) in the same way as the sentences in previous sections: *yi-duo huā* 'a flower' in (49) and *jǐ-ben zǐdiǎn* 'a few dictionaries' in (50) are considered the most patient-like arguments and therefore must be selected as the unmarked complements.

It is very interesting to note that in some expressions the FIGURE and the GROUND can be the same size so that each can be said to be the FIGURE. In cases like these, either argument can be the unmarked complement.[11] This prediction is borne out in (1), repeated here as (52), and (53).

(52) a. Zhāngsān bǎ shūjià bǎimǎn-le shū.
Zhangsan BA bookshelf place-full-PER book
'Zhangšan has filled the bookshelf full of books.'

[10] Size is only one of the properties that distinguish GROUND from FIGURE.

[11] This can be seen as a case of what Dowty (1989) refers to as argument selection indeterminacies, where both arguments have possessed the same number of proto-patient properties. As Carl Pollard points out, verbs suffixed with *-mǎn* are comparable to the *spray/oad* verbs in English. Thus which argument should be selected as the object much depends on which one is considered by the speaker to be the increamental theme (Dowty 1989).

b. Zhāngsān bǎ shū bǎimǎn-le shūjià.
Zhangsan BA book place-full-PER bookshelf
'Zhangsan has filled the books onto bookshelves.'

(53) a. Tā bǎ zhuōzi bǎimǎn-le xiānhuā.
he BA table place-full-PER fresh-flower
'He has covered the table full of fresh flowers'

b. Tā bǎ xiānhuā bǎimǎn-le zhuōzi.
he BA fresh-flower place-full-PER table
'He has covered some table with those fresh flowers'

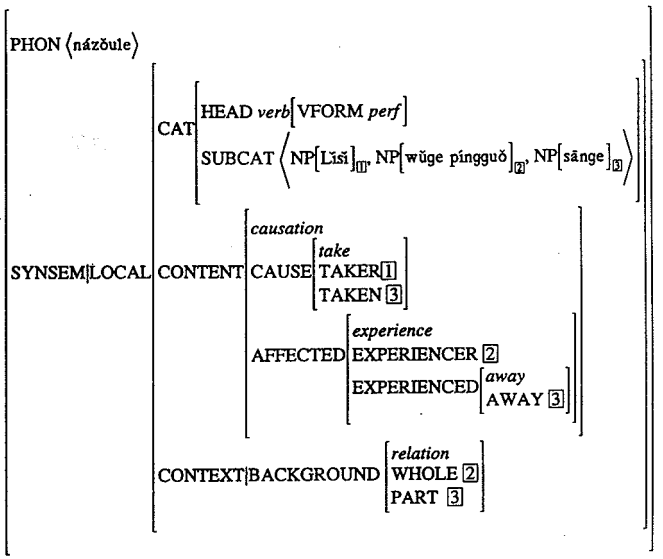
In those examples, the verbs are suffixed with *-mǎn* 'full'. Thus (52) means that the bookshelf is now full of books and the books and the bookshelf are of the same size, while (53) means that the table is totally covered with flowers. Thus either argument in each of the sentences can be the most patient-like and be selected as the unmarked complement.

4.2.3. The Pro'-Binding Phenomenon

We have shown that the arrangement of arguments in Chinese sentences is basically determined by the argument hierarchy, which ranks all the arguments in a sentence from the least patient-like (or the most agent-like) to the most patient-like (or the least agent-like). This hierarchy is shown as an ordered list for the value of the SUBCAT feature in HPSG. Thus the verb entry for *názǒu-le* in (54a) is given as (54b) below.

(54) a. Lǐsī bǎ wǔ-gè píngguǒ názǒu-le sān-gè.
Lisi BA five-CL apple take-go-PER three-CL
'Lisi has taken away three of the five apples.'

b.



Please note that (54b) is an underspecified lexical entry for the verb na!zo&u-le 'have taken away'. This is because many other features can be predicted from the argument structure of the verb.

(55) Principle of Argument Structure

In Chinese, the SUBCAT value of a verb is an ordered list with the most agent-like argument (the one that possesses the most proto-agent properties) as the left-most member and the most patient-like argument (the one that possesses the most proto-patient properties) as the right-most member.

The phrase structure of a sentence or the linear order of the sentential elements can be predicted from the argument selection principle.

(56) Principle of Argument Selection

The first (the left-most) argument on the SUBCAT list is selected as the SUBJ value and if the verb is a nominal transitive[12], the last (the right-most) arguement is selected as the OBJ value. The rest, if any, are selected as the MCOMPS value.

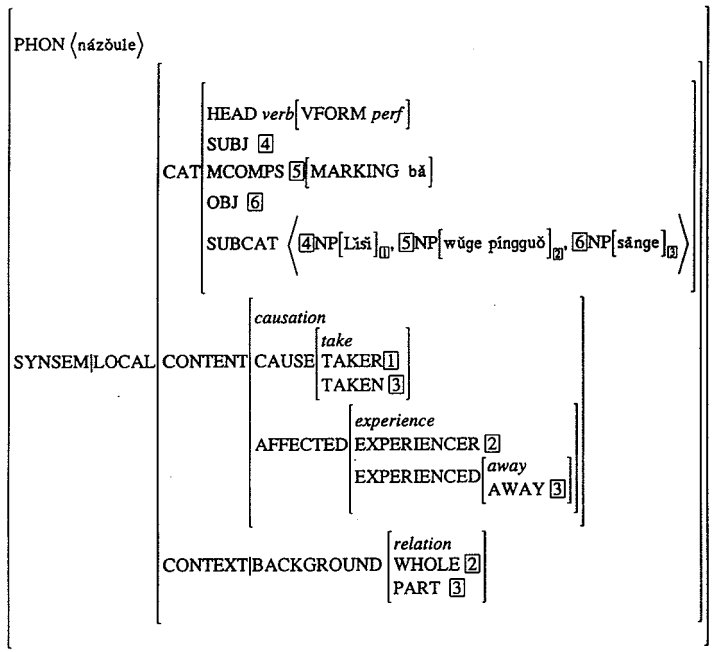
[12] Transitive verbs are divided into nominal transitives that take nominal phrases as the object and locative transitives that take locative phrases as the object. See Chapter 5 for discussion.

(57) Principle of Marking

Marked complements (the arguments on the MCOMPS list) are marked according to the semantic roles which the denotations of the complements fill in the CONTENT value of the verb. Generally, an AFFECTED arguement[13] is marked by *bǎ*, a LOCATION argument is marked by *zài*, a SOURCE argument is marked by *cóng*, an INSTRUMENTAL arguement is marked by *yòng*, a DESTINATION argument is marked by *dào*, a DIRECTION argument is marked by *wǎng*, etc.

Thus, if the lexical entry in (54b) is fully specified, it looks like (54b') below.

(54) b'.



Thus, we see that the argument hierarchy is directly reflected in the phrase structure in the order given as obliqueness hierarchy in (21), repeated here for convenience.

(21) Subject > Marked Complements > Unmarked Complement (= Object)

[13] In Chapter 6, an AFFECTED arguments are always shown to be the embedded (first) identifying argument of the second verb stem, which denotes the effect (AFFECTED event) of an action of the first verb stem.

In the obliqueness hierarchy for arguments in Chinese that I have argued for earlier, the object is the most oblique element because it is the hardest to topicalize or relativize. Although this heirarchy is somewhat different from the English counterpart discussed in the literature (Keenan & Comrie 1977, Pollard & Sag 1994), it still follows the general principles of the HPSG framework. Especially, the binding principles defined in terms of the Obliqueness Hierarchy also work for Chinese. I have two cases to show this.

First, we consider the examples discussed in Section 4.2.1.1, where coindexed expressions are involved. We repeat the example as (58).

(58) Zhāngsān bǎ [wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA five-CL apple take-away-PER three-CL
'Zhangsan took away three of the five apples.'

In (58) the object contains a pro', which is coindexed with a less oblique (specifier-unsaturated) co-argument if there is one. We have shown that in Chinese the object is the most oblique argument and therefore the marked complement ***bǎ wǔ-ge píngguǒ*** in (58) is a legimate binder for the pro' in the object position. Thus the acceptibility of (58) is correctly predicted. Also, since marked complements are less oblique than the object, the pro' in the marked complement cannot be coindexed by the object. This is shown in the following examples.

(59) *Zhāngsān bǎ [wǔ-gè[pro'$_i$]$_{N'}$]$_{NP}$ názǒu-le [sān-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$.
Zhangsan BA five-CL take-away-PER three-CL apple
'*Zhangsan took away three apples of the five.'

Since the subject is less oblique than complements, it can also serve as a binder for the pro' in the complement positions, marked or unmarked, but not vice versa.

(60) a. [Wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$ làn-le [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
five-CL apple rot-PER three-CL
'Three of the five apples have rotted.'

b. *[Wǔ-gè[pro'$_i$]$_{N'}$]$_{NP}$ làn-le [sān-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$.
five-CL rot-PER three-CL apple
'*Three apples of the five have rotted.'

(61) a. [Zhè-kuāng[píngguǒ$_i$]$_{N'}$]$_{NP}$ bǐ [nèi-kuāng[e$_i$]$_{N'}$]$_{NP}$ duō [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
this-basket apple compared-to that-basket more three-CL
'There are three more apples in this basket than in that one.'

b. *[Zhè-kuāng[pro'$_i$]$_{N'}$]$_{NP}$ bǐ [nèi-kuāng[píngguǒ$_i$]$_{N'}$]$_{NP}$ duō [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
this-basket compared-to that-basket apple more three-CL

c. [Nèi-kuāng[píngguǒ$_i$]$_{N'}$]$_{NP}$ duō [sān-gè[pro'$_i$]$_{N'}$]$_{NP}$.
that-basket apple more three-CL
'There are three more apples in that basket.'

d. *[Zhè-kuāng[pro'$_i$]$_{N'}$]$_{NP}$ bǐ [nèi-kuāng[pro'$_i$]$_{N'}$]$_{NP}$ duō
this-basket compared-to that-basket more
[sān-ge [píngguǒ$_i$]$_{N'}$]$_{NP}$.
three-CL apple

e. *[Zèi-kuāng[pro'$_i$]$_{N'}$]$_{NP}$ duō [sān-ge [píngguǒ$_i$]$_{N'}$]$_{NP}$.
that-basket more three-CL apple

Thus coindexing facts support the argument hierarchy analysis.

The next case concerns so-called inalienable object examples discussed earlier. We repeat the examples below.

(62) a. Zhāngsān bō-le júzi de pí.
Zhangsan peel-PER orange DE skin
'Zhangsan has peeled the skin of the orange.'

b. Zhāngsān bǎ júzi bō-le pí.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the skin off the orange.'

c. *Zhāngsān bǎ pí bō-le júzi.
Zhangsan BA skin peel-PER orange

(63) a. Lǐsi shuāiduàn-le dèngzi de yītiáo tuǐ.
Lisi throw-break-PER stool DE one-CL leg
'Lisi has broken one of the stool's legs.'

b. Lǐsi bǎ dèngzi shuāiduàn-le yītiáo tuǐ.
Lisi BA stool throw-break-PER one-CL leg
'Lisi has broken one of the stool's legs.'

c. *Lǐsi bǎ yītiáo tui shuāiduàn-le dèngzi.
Lisi BA one-CL leg throw-break-PER stool

What is characteristic of these sentences is that the unmarked complement in the (b) sentences denotes an inalienable part of the object denoted by the marked complement. The NPs that denote the parts have the same function as those of relational nouns (Dowty and Barker 1994) in that their meaning seems incomplete without a relational modifier such as a possessive pronoun. Thus a use of the bare NP *pí* will make people wonder whose shell/skin we are talking about; a use of *yī-tiáo tuǐ* will make people ask whose leg it is. This is clear in the (a) sentences because the use of modifiers tells us that it is the orange shell or the leg of a stool. But this is not so clear in the (b) sentences, where the relational modifiers are not there in the object NP. However, as can be seen from the (a) sentences, the NP in the marked complements is devoted to this relation. To make this connection, an empty category pro is suggested (Li 1985) within the object so that it can be bound by the first available NP, which, in our case, is the preverbal NP, and therefore the relationship between the postverbal NP and the preverbal NP can be realized. In our analysis, the preverbal *bǎ*-NP is a marked complement, which ranks higher than the postverbal bare NP in the argument hierarchy proposed in this paper. Assuming the binding principles based

on the obliqueness hierarchy (Pollard and Sag 1992), only the less oblique coargument can serve as the binder for a more oblique argument, not vice versa, the pro in the object poistion must be bound by the *bǎ*-marked preverval complement. Thus the approach correctly predicts the facts shown in (62) and (63).

4.3. Other Issues

Having discussed how the current argument hierarchy has led to the correct analysis of Chinese sentential structure, I now turn to some other proposals about argument structure made in the recent past in some other grammatical frameworks. The most notable ones are C-R Huang's Lexical Functional Grammar (LFG) approach and C-T Huang's GB approach. We will have a close look at each of them below.

4.3.1. C-R Huang's (1991) Proposal

Huang 1991 argues, within the framework of LFG, that the Chinese arguement hierarchy takes the following form. Note that Huang uses a thematic role hierarchy instead of a grammatical argument hierarchy.

(64) Agent > Ben/Mal > Instr > Th/Pat > Exp/Goal > Loc/Dom

Recall that I have argued that the Chinese argument hierarchy should have the agent (=the most agent-like or the least patient-like) at one end and the patient (=the most-patient like) on the other. In comparison, (64) is just like ours except that GOAL and LOCATION are treated as more patient-like than the patient itself. We will look at these two cases separately.

First let's consider the evidence that Huang has used to argue for the order of Patient > Goal. Three sets of data are used to support the claim. The first involves lexicalized compounds and the second involves idioms. The argument basically says that NPs denoting GOAL are more likely to be either incorporated into lexical compounds or resolved into frozen form and show a closer affinity to the predicate than the THEME. The examples he cites include the following.

(65) Lǐsi chéng-míng-le.
Lisi attain-fame-PER
'Lisi became famous.'

While I have no objections to his examples or observations, I do know that there are numerous examples I can cite with other thematic roles incorporated into lexical compounds or idioms. Examine the following.

(66) a. Lǔ Zhìsheng **quán-dǎ** Zhèng guānxi.
Lu Zhisheng **fist-beat** Zheng guanxi
'Lu Zhisheng **beats** Zhengguanxi with his fists.'

b. Lín Jiàotou **huǒ-shāo** shānshén-miào.
Lin coach **fire-burn** mountain-god-temple
'Coach Lin burns **the** mountain-god temple (with fire).'

c. Máo Zédōng **pào-dǎ** sīlìngbù.
Mao Zedong **cannon-attack** headquarters
'Mao Zedong attacks the (enemy) headquarters with cannon (fire).'

(67) a. Jiěfàngjūn yí-**bān** sìchuān.
PLA move-troops Sichuan
'The PLA moves **its** troops to Sichuan (province).'

b. Wǒ hěn dān-**xīn** zhè-jiàn shì.
I very hold-**heart** this-CL matter
'I am very concerned about this matter.'

c. Shíwán **zhēnqín** luòhù Sìxià hú.
ten-ten-thousand **treasure-bird** fall-home Sixia lake
'Hundreds of thousands of rare birds now make Sixia Lake their home.'

In (66) it is the instrumental role rather than the patient that has been incoporated into the lexical compound verbs and in (67) it is the patient role. Thus the ability to be lexicalized or incorporated into idioms should not be taken as evidence to rank the GOAL below PATIENT.

The third set of data involves ditransitive verbs. Huang cites the following.

(68) a. Wǒ sòng-le **Lǐsì** yì-ben shū.
I give-PER **Lisi** one-CL book
'I gave Lisi a book.'

b. *Lǐsì (bèi wǒ) **sòng-le** yì-ben shū.
Lisi BEI I **give-PER** one-CL book
'Lisi was given a book by me.'

c. Nèi-ben shū **(bèi** wǒ) sòng-le Lǐsì.
that-CL book **BEI** I give-PER Lisi
'*That book was given Lisi by me.'

With the examples in (68), Huang claims that the order of the two roles, namely, THEME and GOAL, in Chinese is reversed from the English counterpart: when the highest ranking role in a ditransitive verb is suppressed, as is seen in a passivized sentence, the next highest role becomes the highest and assumes the subject function. In (68), the Chinese data show that the next highest role is the GOAL while in the English data, it is the THEME. While I do not take issue with Huang's theoretical reasoning, it must be pointed out that the data in (68) is very misleading. First let's consider (68b), which is the passivized version of (68a). As has been pointed out in the literature, Chinese passives have some additional semantic

restrictions on their acceptability. That is, in order for an Chinese passive to be acceptable, it also has to have an adversative interpretation.[14] Consider the following examples.

(69) a. Dàjia **sòng-le** Zhōusān yí-ge chuòhào.
people **give-PER** Zhousan one-CL nickname
'People gave Zhousan a nickname.'

b. Zhōusān bèi dàjia **sòng-le** yí-ge chuòhào.
Zhousan by people **give-PER** one-CL nickname
'Zhousan was given a nickname by (his) people.'

c. *Yí-ge chuòhào bèi dàjia **sòng-le** Zhōusān.
one-CL nickname by people **give-PER** Zhousan

(70) a. Jǐngchá **fǎ-le** Zhāngsān sānshi-kuài qián.
police **punish-PER** Zhangsan thirty-CL money
'Police fined Zhangsan thirty dollars.'

b. Zhāngsān bèi jǐngchá **fǎ-le** sānshi-kuài qián.
Zhangsan by police **punish-PER** thirty-CL money
'Zhangsan was fined thirty dollars by the police.'

c. *Sānshi-kuài qián bèi jǐngchá **fǎ-le** Zhāngsān.
thirty-CL money by police **punish-PER** Zhangsan

(71) a. Nèi-ge jiāhuo **pō-le** Zhāngsān yì-shēng shuǐ.
that-CL guy **spill-PER** Zhangsan one-CL water
'That guy spilled water all over Zhangsan.'

b. Zhāngsān bèi nèi-ge jiāhuo **pō-le** yì-shēng shuǐ.
Zhangsan by that-CL guy **spill-PER** one-CL water
passive of 'That guy spilled water all over Zhangsan.'

c. *Yì-shēng shuǐ bèi nèi-ge jiāhuo **pō-le** Zhāngsān.
one-CL water by that-CL guy **spill-PER** Zhangsan

In (69) the same verb *sòng* is used. However, since being given a nickname is not considered a good thing in Chinese culture, (69c) is accepted without any hesitation. If you violate the rules of society, you sometimes get fined and being fined is not an honorable thing for a good citizen. Therefore (70b) is an acceptable passive sentence. The same goes with (71b). Thus we see no syntactic problems when the indirect object (with the role of EXP/GOAL) in a ditransitive is passivized. Furthermore, it is also shown in the following that in these examples, as well as in Huang's, the IO's, but not the DO's, are freely exchangible with a preverbal marked complement.

[14] Thus, if the THEME in (68) denotes a entity that has an adversative interpretation, the passive sentence is acceptable, as is shown in the following.

(i) Lǐsì bèi wǒ sòng-le yí-ge wàihào.
Lisi BEI I give-PER one-CL nickname
'Lisi was given a nickname by me.'

(68) d. Wǒ gěi Lǐsǐ sòng-le yí-ben shū.
I GEI Lisi give-PER one-CL book
'I have sent a book to/for Lisi.'

e. *Wǒ gěi/bǎ yí-ben shū sòng-le Lǐsǐ.[15]
I GEI/BA one-CL book give-PER Lisi

(69) d. Dàjia gěi Zhōusān sòng-le yí-ge chuòhào.
people GEI Zhousan give-PER one-CL nickname
'People gave Zhousan a nickname.'

e. *Dàjia gěi/bǎ yí-ge chuòhào sòng-le Zhōusān.
people GEI/BA one-CL nickname give-PER Zhousan

(70) d. Jǐngchá bǎ Zhāngsān fá-le sānshi-kuài qián.
police BA Zhangsan punish-PER thirty-CL money
'The police fined Zhangsan thirty dollars.'

e. *Jǐngchá bǎ sānshi-kuài qián fá-le Zhāngsān.
police BA thirty-CL money punish-PER Zhangsan

(71) d. Nèi-ge jiāhuo bǎ Zhāngsān pō-le yì-shēng shuǐ.
that-CL guy BA Zhangsan spill-PER one-CL water
'That guy spilled water all over Zhangsan.'

e. *Nèi-ge jiāhuo bǎ yì-shēng shuǐ pō-le Zhāngsān.
that-CL guy BA one-CL water spill-PER Zhangsan

Thus the above examples refute the claim that IOs in Chinese cannot be passivized and we conclude that the claim that PATIENT ranks higher than GOAL is not well supported. Furthermore, the above examples also show that the direct object is the hardest element to passivize. Actually, .we find that (68c) is not acceptable to many Chinese speakers. A more acceptable paraphrase of (68c) is the following.

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[15] It is pointed out to me (Carl Pollard, personal communication) that a more acceptable paraphrase of (68e) is the following.

(i) Wǒ bǎ nèi-ben shū sònggěi-le Lǐsǐ.
I BA that-CL book give-give-PER Lisi
'I have given that book to Lisi.'

Although no ready explanation of the (un)acceptability of (68e) and (i) has been given in the literature, we believe that it has something to do with the way compounds are formed in Chinese. Examine the following.

(ii) Wǒ sòng-le yí-ben shū.
I give-PER one-CL book
'I have given (someone) a book.'

(iii) Nèi-ben shū gěi-le Lǐsǐ.
that-CL book give-PER Lisi
'That book is given to Lisi.'

When the two verbs *sòng* 'give' and *gěi* 'give' form a compound, their argument list are combined to form a new list. In this case, the object of *sòng* is identified with the subject of *gěi*.. See Chapter 6 for a detailed discussion of argument identification in compound formation.

(72) a. Nèi-ben shū (bèi wǒ) sònggěi-le Lǐsǐ.
that-CL book BEI I give-PER Lisi
'*That book was given Lisi by me.'

Note that in (72) the verb is now a compound and it displays an array of syntactic properties different than the monosyllabic verb *sòng* in (68). Thus the above data show that IOs are more accessible than DOs in Chinese for passivization. This is consistent with our claim that in Chinese DO's rank the lowest (or the most patient-like) in the argument hierarchy.

Now let's take a look at Huang's claim that the LOCATIVE is lower than the PATIENT in the argument hierarchy in Chinese. This claim is based on the following .

(73) a. Shū fàng zài zhuōzi-shàng.
book put at desk-top
'The book is (put) on the desk.'

b. Zhuōzi-shàng fàng-zhe shū.
desk-top put-DUR book
'There are books (put) on the desk.'

(74) a. Zhāngsān tǎng zài shāfā-shàng.
Zhangsan lie at sofa-top
'Zhangsan lies on the sofa.'

b. Shāfā-shàng tǎng-zhe Zhāngsān.
sofa-top lie-DUR Zhangsan
'There lies Zhangsan on the sofa.'

Before going further with the discussion, some clarification seems in order about the data cited in (73) and (74). In the original data, Huang makes *zài* optional in (73a) and (74a). However, most of my colleagues find these sentences unacceptable without *zài*. Thus we will only consider the data we use here. This is consistent with the source data in Huang's discussion, i.e. the so called locative inversion in Chinese (Chang 1990). It is crucial to note that in Huang (1991) and Chang (1990) locatives are defined as phrases headed by *zài*. Thus in (73a) the locative expression is *zài zhuōzi-shàng* and in (74a) it is *zài shāfā-shàng*. As in traditional analyses, *zhuōzi-shàng* and *shāfā-shàng* are treated as NPs (see Li and Thompson 1981 and Li 1985).

Huang argues that *fàng* and *tǎng* as used in the above examples are unaccusative verbs since in (73b) and (74b) they can take objects but in (73a) and (74a), when the subject positions are not occupied by others, they can fill the subject position. Thus *shū* in (73) and *Zhāngsān* in (74) must be treated as having the thematic role of PATIENT. The arrangement in the (a) sentences shows that PATIENTS must rank higher than LOCATIVES.

Although it is not my intention to question the use of unaccusativity in Chinese verbs, I must point out that the following examples related to those in (73) may better illustrate Huang's point of view.

(75) a. Zhāngsān bǎ shū fàng *(zài) zhuōzi-shàng.
Zhangsan BA book put at desk-top
'Zhangsan put the book on the table.'

b. Shū bèi Zhāngsān fàng *(zài) zhuōzi-shàng.
book BEI Zhangsan put at desk-top
'The book was put on the table by Zhangsan.'

c. *Zhuōzi-shàng bèi Zhāngsān bǎ shū fàng (zài).
desk-top BEI Zhangsan BA book put at

Recall that in relational grammar, when the highest ranking NP in the subject position is suppressed, only the next highest NP can become the highest ranking NP and take the subject position. In (75) we see that the next highest NP is the THEME, not the LOCATIVE. Thus Huang's argument seems to be well supported.

However, I want to challenge Huang's argument by looking at LOCATIVEs in Chinese. Recall that the locative inversion examples are the basis for Huang's argument. We repeat the examples below.

(73) a. Shū fàng zài zhuōzi-shàng.
book put at desk-top
'The book is (put) on the desk.'

b. Zhuōzi-shàng fàng-zhe shū.
desk-top put-DUR book
'There are books (put) on the desk.'

The key element in Huang's argument is the treatment of the verb as an unaccusative verb, which in standard terms (references here) has a non-agent thematic role but does not have an internal syntactic case. Thus the normal outcome of an unaccusative verb is an intransitive with the NP bearing the patient role in the subject position. This is shown in (73a) with *shū* as the patient-role bearing NP in the subject position. I don't have any problem with this line of argument. My question is how the postverbal element needs to be treated. Assume with Huang that the NP *shū* ends up in the subject position because that is the only position where it can get Case. Assume further with Case Theory that any NP without a Case would be ungrammatical. Now the only ways we can explain the postverbal *zhuōzi-shàng* are to treat *zài* either as a preposition or as a verb, If *zài* is a preposition, it can form a PP with the NP *zhuōzi-shàng*. However, the following examples show that *zài* is neither a preposion nor a verb. It is actually a part of the compound verb *fàngzài*.

(76) a. Shū fàng zài-le zhuōzi-shàng.
book put at-PER desk-top
'The book has been put on the desk.'

b. *Shū fàng-le zài zhuōzi-shàng.
book put-PER at desk-top

(77) a. Zhāngsān bǎ shū fàng zài-le zhuōzi-shàng.
Zhangsan BA book put at-PER desk-top
'Zhangsan has put the book on the desk.'

b. *Zhāngsān bǎ shū fàng-le zài zhuōzi-shàng.
Zhangsan BA book put-PER at desk-top

It is now widely accepted that *-le* is an inflectional morpheme (Gao 1992, Dai 1991) attached to verbs to denote the completion of the action denoted by the verb (Smith 1991). The (a) sentences above show that *zài* cannot be a preposition because the inflectional morpheme only attaches to verbs in Chinese. The ability to be inflected with *-le* shows that *zài* is by itself not a verb, either, for the verb *zài* is one of the stative verbs in Chinese that refuse perfective and durative marking. Consider the following.

(78) a. Zhāngsān zài(*-le/*-zhe) jiāli ma?
Zhangsan at PER/DUR home-inside Q
'Is Zhangsan inside the house?'

b. Tā bú/*méiyou zài jiāli.
he not/not-PER at home-inside.
'He is not inside the house.'

Then why in (76a) and (77a) does *zài* end up with *-le* ? The only reasonable answer is that *-le* in these cases is not attached to *zài* but to the compound verb *fàngzài*. In fact, (76b) and (77b) show that any attempt to insert the inflectional morpheme into the compound results in unacceptability of the sentence. Thus it is our conclusion that *fàngzài* is better treated as a compound verb, with syntactic properties that are different from its component verbs. Thus it must be treated as a different verb entry from the monosyllabic verb *fàng*. Chang's notion of locative inversion in Chinese is now seen to be based on two different verbs and therefore is an invalid analysis. When we look at the verbs individually, we find that inversion is not possible. Consider the following.

(79) a. Shū fàng-zài zhuōzi-shàng.
book put-at desk-top
'The book is (put) on the desk.'

b. *Zhuōzi-shàng fàng-zài shū.
desk-top put-at book
Intended: 'On the desk is (put) a book.'

(80) a. Zhuōzi-shàng fàng-zhe shū.
desk-top put-DUR book
'There are books (put) on the desk.'

b. *Shū fàng-zhe zhuōzi-shàng.
book put-DUR desk-top
Intended: 'Some books are (put) on the desk.'

Thus there is no case to be made for the so called locative inversion in Chinese in these examples. Nor do we find any evidence for Huang's claim of unaccusativity in either of the two verbs. To start with, we find that none of them can ever be seen as an intransitive verb. Recall that the nature of an unaccusative verb is the ability of the object of a transitive verb to alternate with the subject of the same verb when used intransitively. This will force the theme/patient role to appear in the subject position. Note that none of the following is acceptable when the verb has only one argument.

(81) a. *Shū fàng-zài.
book put-at

b. *Zhuōzi-shàng fàng-zài.
desk-top put-at

(82) a. *Zhuōzi-shàng fàng-zhe.
desk-top put-DUR

b. *Shū fàng-zhe.
book put-DUR

Thus I have disputed the claim that Chinese unaccusative verbs support the argument hierarchy where PATIENT ranks higher than LOCATIVE.

4.3.2. C-T Huang's (1991) Proposal

Another proposal about the Chinese argument hierarchy can be seen in C-T Huang's summary remarks where the following is posited.

(83) Agent > Exp > Theme/Goal > Goal/Theme > Oblique

This hierarchy, as Huang acknowledges, basically follows the English counterpart (Larson 1988). However, there are some important differences. Among them is the relative order of Goal and Theme. As can be seen in the formulation, the (animate) goal can be either higher or lower than the theme. Although Huang does not give specific examples from which the conclusion is reached, it seems obvious that the following much discussed examples (Tai 1985) have a lot to do with it.

(84) a. Zhāngsān gěi Lǐsǐ sòng-le yī-ben shū.
Zhnagsan to Lisi send-PER one-CL book
'Zhangsan has sent a book for/to Lisi.'

b. Zhāngsān sòng-le yī-ben shū gěi Lǐsǐ.
Zhnagsan send-PER one-CL book to Lisi
'Zhangsan has sent a book to Lisi.'

The general consensus is that when *gěi* is used preverbally, it is ambiguous between denoting beneficiary and goal. But when it is used postverbally, it can only denote goal (Tai 1985). Thus the rank of GOAL in Chinese may be higher or lower than the THEME. However, the analysis of postverbal *gěi* as a preposition has already been challenged in

Chapter three of the thesis. There I have argued that postverbal *gěi* is actually a verb. Thus under the present analysis where *gěi* is treated as a marker, there is no alternation between a preverbal marked complement and a postverbal marked complement. In fact, the following examples show that the analysis of *gěi* as a verb is correct.

(85) a. Zhāngsān mǎi-le yī-ben shū gěi Lǐsǐ.
Zhnagsan send-PER one-CL book give Lisi
'Zhangsan has bought a book to give to Lisi.'

b. Zhāngsān gěi Lǐsǐ mǎi-le yī-ben shū.
Zhnagsan for/to Lisi send-PER one-CL book
'Zhangsan has bought a book for Lisi.'

A synonym for *gěi* in Chinese is *sòng*, except that *sòng* can only function as a verb while *gěi* can function either as a verb or a marker. If the postverbal *gěi* in (85a) is a verb, then there should be no problem replacing it with its synonymous verb *sòng*. Since the preverbal *gěi* is only a marker, replacing it with *sòng* will result in an unacceptable sentence. The following shows that this prediction is borne out.

(86) a. Zhāngsāng mǎi-le yī-ben shū sòng Lǐsǐ.
Zhnagsan send-PER one-CL book give Lisi
'Zhangsan has bought a book to give to Lisi.'

b. *Zhāngsāng sòng Lǐsǐ mǎi-le yī-ben shū.
Zhnagsan to Lisi send-PER one-CL book
Intended: 'Zhangsan bought a book for Lisi.'

Thus I conclude that in Chinese the goal denoting argument can only appear before the verb and therefore the thematic role of goal is always higher or less patient-like than the patient/theme.

4.4. Conclusion

In this Chapter, I have investigated the argument hierarchy in Chinese. The devices used to determine the NP Accessibility Hierarchy (Keenan and Comrie 1977), namely, passivizability and relativizability, and the proto-role property tests all favor the argument hierarchy with the most agent-like NP/LP as the least oblique element in the sentence and most patient-like NP/LP as the most oblique element. What is important for this argument hierarchy is that it determines sentential structure. I have shown, for instance, that a verb with three arguments will appear as a sentence with the most agent like NP as the subject and the most-patient like NP as the postverbal unmarked complement (=the object). However, if the most agent-like argument is surpressed from the the original verb, the next most-agent like NP/LP will take the subject position. The same holds true with the surpression of the most-patient like argument in a sentence with a transitive verb (a verb

that requires an unmarked complement). Thus the following sentences now have a clear explanation.

(87) a. Zhāngsān zài zhuōzi-shàng bǎi-le yī-fù huà.
Zhangsan at table-top place-PER one-CL painting
'Zhangsan has placed a painting on the table.'

b. Zhuōzi-shàng bǎi-le yī-fù huà.
table-top place-PER one-CL painting
'There is a painting placed on the table.'

(88) a. Zhāngsān xǐhuān zài fànguǎn chī fàn.
Zhangsan like at restaurant eat meal
'Zhangsan likes to have his meal in a restaurant.'

b. Zhāngsān xǐhuān chī fànguǎn.
Zhangsan like eat restaurant
'Zhangsan likes to eat in a restaurant.'

Apparent exceptions, however, do occur. In the following, we see a sentence with the location rather than the patient as the unmarked complement.

(89) Zhāngsān bǎ yī-fù huà bǎizài-le zhuōzi-shàng.
Zhangsan BA one-CL painting place-at-PER table-top
'Zhangsan has placed a painting on the table.'

Recall that in the Chinese argument hierarchy, location is always less-patient like than the patient. Thus the arrangement of the arguments in (86) appears to be a violation of a general principle of phrase structure. I will try to find an explanation in the next chapter.

Chapter 5

LOCATIVE PHRASES

5.0. Introduction

In the last chapter I have argued that the value of SUBCAT in a verb's entry should be treated as a list that reflects the argument hierarchy with the most agent-like element first and the most patient-like NP last. If the transitivity of the verb is specified, the linear order of arguments is always predictable. For instance, a transitive verb with a SUBCAT list of two or more is alway realized with the most patient-like argument as the unmarked complement and the most agent-like argument as the subject. The rest, if any, are always the marked complements. Thus the following array of sentences headed by the verb *qiē* 'chop' are all well-formed.

(1)

$$\begin{bmatrix} \text{PHON} \langle \text{qiē} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb} \\ \text{SUBCAT} \left\langle \text{NP}_{\boxed{1}}, (\text{LP}_{\boxed{2}}), (\text{NP}_{\boxed{3}}), \text{NP}_{\boxed{4}} \right\rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \text{RELATION } \textit{cut} \\ \text{CUTTER } \boxed{1} \\ \text{CUT } \boxed{4} \\ \text{LOCATION } \boxed{2} \\ \text{INSTRUMENT } \boxed{3} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

a. Zhāngsān kěyi zài mùsháo-lǐ yòng mǎtidāo qiē cài.
Zhangsan can ZAI wood-ladle-inside YONG horse's hoof-knife chop veg.
'Zhangsan can chop vegetables with a horse's hoof shaped knife in a wooden ladle.'

b. Zhāngsān kěyi yòng mǎtidāo qiē cài.
Zhangsan can YONG horse's hoof-knife chop vegetable
'Zhangsan can chop vegetables with a horse's hoof shaped knife.'

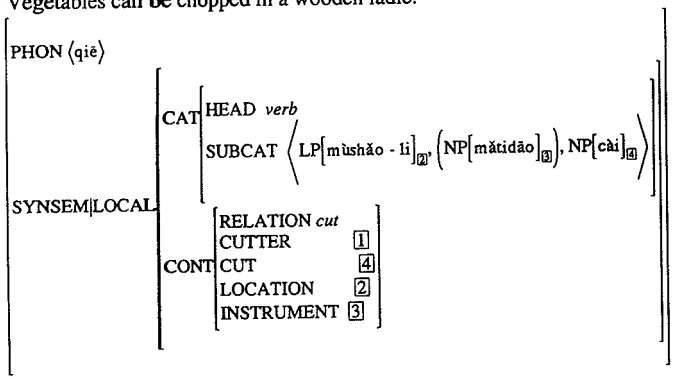
c. Zhāngsān kěyi zài mùsháo-lǐ qiē cài.
Zhangsan can ZAI wood-ladle-inside chop vegetable
'Zhangsan can chop vegetables in a wooden ladle.'

d. Zhāngsān kěyi qiē cài.
Zhangsan can chop vegetable
'Zhangsan can chop vegetables.'

And actually, not only the intermediate arguments can be optional, even the most agent-like argument can also be missing. That is, it may not be lexically realized. In this case, the next most agent-like argument becomes the most agent-like and assumes the subject function. In our case, when Zhangsan is missing, *mùsháo-li* will take the subject position.

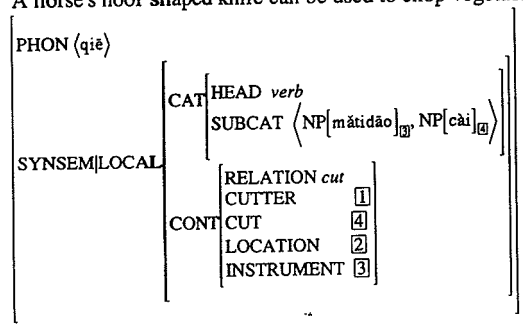
(2) a. Mùsháo-lǐ kěyi yòng mǎtidāo qiē cài.
wood-ladle-inside can YONG Horse's hoof-knife chop vegetable
'Vegetables can be chopped with a horse's hoof shaped knife in a wooden ladle.'

b. Mùsháo-lǐ kěyi qiē cài.
wood-ladle-inside can chop vegetable
'Vegetables can be chopped in a wooden ladle.'



If the second most agent-like argument is also missing, the third most agent-like argument become the most agent-like. In this case it is *mǎtidāo*.

(3) a. Mǎtidāo kěyi qiē cài.
Horse's hoof-knife can chop vegetable
'A horse's hoof shaped knife can be used to chop vegetables.'



I have also shown in the previous chapter that if the most patient-like argument is missing for a transitive verb, the next most patient-like NP will become most patient-like and take the unmarked complement position. Here are some more examples.

(4) a. Zhāngsān yǐjing zài zhuōzi-shàng bǎihǎo-le cānjù.
Zhangsan already ZAI table-top set-good tableware
'Zhangsan has already set up the tableware on the table.'

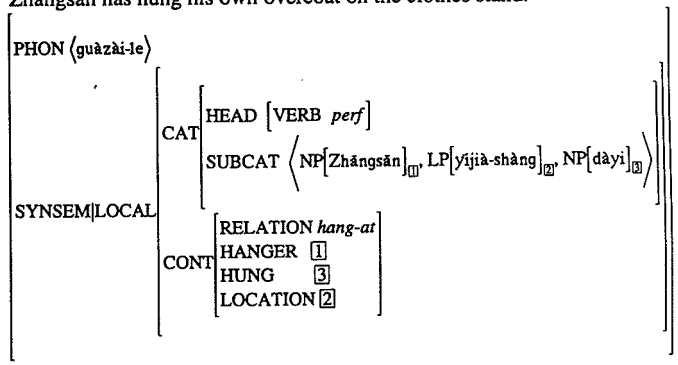
b. Zhāngsān yǐjing bǎihǎo-le cānjù.
Zhangsan already set-good tableware
'Zhangsan has already set the tableware.'

c. Zhāngsān yǐjing bǎihǎo-le zhuōzi.
Zhangsan already set-good table
'Zhangsan has already set the table.'

d. *Zhāngsān yǐjing bǎ cānjù bǎihǎo-le zhuōzi-(shàng).
Zhangsan already BA tableware set-good table-top
Intended: 'Zhangsan has already set the table with tableware.'

Thus we can see that there is a direct mapping between the argument hierarchy and the linear order of the phrase structure. A mismatch generally results in unacceptability, as is the case of (4d). As has been mentioned in the previous chapter, however, exceptions do occur. Examine the following.

(5) a. Zhāngsān bǎ zìjǐ de dàyi guàzài-le yǐjià-shàng.
Zhangsan BA self DE big-coat hang-at-PER clothes-rack-top
'Zhangsan has hung his own overcoat on the clothes stand.'



b. *Zhāngsān zài yǐjià-shàng guàzài-le zìjǐ de dàyi.
Zhangsan ZAI clothes-rack-top hang-at-PER self DE big-coat

As we can see that the direct mapping in (5b) is not acceptable. The well-formed sentence (5a) shows that the most patient-like NP needs to be in a preverbal marked complement position while the locative functions as the object. To explain this, I argue that there are two different subsorts of transitive verbs, the nominal ones and locative ones. The nominal

transitive verbs take NP's as their unmarked complement while the locative transitive verbs like the compound verb *guàzài-le* requires an LP rather than an NP as its object. This leads to the need of establishing a new category Locative Phrase (LP) in addition to the traditional NP's in Chinese. This Chapter will be organized as follows. In Section 5.1 we observe the similarities and differences between locative phrases and nominal phrases in Chinese and suggest that they belong to different syntactic categories. In Section 5.2 we take a close look at the locative phrase and give a linguistic description of its structure. Section 5.3 shows how the proposed analysis of the locative phrase leads to the correct explanation of the sentential structures and the exact semantic interpretations the structure has.

5.1. Locative Phrases vs. Nominal Phrases

It has been argued in the literature (Huang 1982, Li 1985) that there are (at least) two kinds of NP's in Chinese, regular NP's and locative NP's (Cf. Chang 1990, Tai 1993). Earlier works (Tai 1973 and reference cited there) treated the phrases with suffixes *-lǐ* 'inside', *-shàng* 'on-top', etc. as postpositional phrases. That is, these suffixes are regarded as postpositions. This point of view has been used to support the claim that Chinese is a SOV language. However, one difficulty for this argument is that those so-called postpositional phrases have never been shown to behave like syntactic PP's. On the contrary, they have been shown to behave more like NP's. Since they usually refer to locations, they are called locative phrases (LocP's)[1] (Li 1985, Chang 1990). Evidence for the LocP claim includes the following. First, it has been pointed out that LocPs can function as the subject or the object of the sentence just like regular NP's. Compare the following examples.

(6) a. Nèi-zhang zhuōzi-shàng zhǐ yǒu sān-ben shū.
that-CL table-top only have three-CL book
'There are only three books on that table.'

b. Nèi-zhang zhuōzi zhǐ yǒu sān-tiao tuǐ.
that-CL table only have three-CL leg
'That table only has three legs.'

(7) a. Zhāngsān mǎi-le yi-jiā fànguǎn.
Zhangsan buy-PER one-CL restaurant
'Zhangsan has bought a restaurant.'

b. Zhāngsān zhùzài yi-jiā fànguǎn-li.
Zhangsan live-at one-CL restaurant-liside
'Zhangsan lives in a restaurant.'

[1] Typical locatives in Chinese have suffixes such as *-lǐ* 'inside', *-wài* 'outside', *-shàng* 'on top', *-xià* 'beneath', etc. which I will treat as locative markers. But place nouns such as *Běijīng* 'Beijing', *Niǔyue* 'New York' etc. can function as locatives without such markers. In fact, expressions such as **Běijīng-lǐ* 'inside Beijing', *Niǔyue-shàng* 'above New York' are unacceptable.

Besides, they both has been shown to be able to serve as the object of prepositions. In our analysis, both can be marked complements as well as unmarked complenents.

(8) a. Lǐsi zài shítáng-lǐ chī fàn.
Lisi at dining-hall-inside eat meal
'Lisi eats his meal inside the dining hall.'

b. Lǐsi zài shítáng chī fàn.
Lisi at dining-hall eat meal
'Lisi eats his meal in a dining hall.'

It has been also pointed out that both NPs and LocPs can function as nominal modifiers with the help of the marker *de*.

(9) a. Fànguǎn-lǐ de rén hěn duō.
restaurant-inside DE people very many
'There are a lot of people in the restaurant.'

b. Lǐsi de péngyǒu hěn duō.
Lisi DE friend very many
'Lisi has a lot of friends.'

Thus these sentences show that LocPs function much like regular NP' s. However, with just these examples, we also see the differences between the two. First, although LocPs can function as the subject of the sentence, they enter into different semantic relations with other arguments in the sentence. This is clearly illustrated in (6) and the following examples.

(10) a. Xuéshēng-shítāng-lǐ lái-le yī-wèi xīn jīnglǐ.
student-dining-hall-inside come-PER one-CL new manager
'There is a new manager inside the student dining hall.'

b. Xuéshēng-shítāng lái-le yī-wèi xīn jīnglǐ.
student-dining-hall come-PER one-CL new manager
'The student dining hall now has a new manager.'

In (10a) we understand that the student dining hall is only a location where a new manager shows up. The sentence does not give any information about whether he comes to take charge of the dining hall or not. However, in (10b) the student dining hall is indicated to be under the management of the new manager. That is, he is newly appointed to take charge of the student dining hall. The semantic difference between the two phrases *Xuéshēng-shítāng-lǐ* and *Xuéshēng-shítāng* alone does not seem to give a very adequate explanation for the different interpretations in (10), and we therefore need to distinguish them syntactally. That is, a categorical distinction between the two may help us better understand the difference.

I must point out that the same distinction also exists when the two phrases are used as nominal modifiers.

(11) a. Zhuōzi-shàng de shū heň duō.
table-top DE book very many
'There are a lot of books on the table.'

b. Zhāngsān de shū heň duō.
Zhangsan DE book very many
'Zhangsan has a lot of books.'

We see that the LocP as a nominal modifier only indicates the location of the modified while the NP *Zhāngsan* in (11b) indicates the possessor for the modified NP *shū*. Distinguishing the two syntactically may lend great help in explaining the difference illustrated in the above examples.

The second piece of evidence for the need to syntactically distinguish the two comes from the following example, where both LocPs and NPs are the object of so-called prepositions.

(12) a. Xúeshēng-men zài xúeshēng-shítāng chī fàn.
student-Plural ZAI student-dining-hall eat meal
'Students have their meals in a student dining hall.'

b. Zhāngsan zài xúeshēng-shítāng-lí chī fàn.
Zhangsan ZAI restaurant-inside eat meal
'Zhangsan eats his meal inside a student dining hall.'

The sentence in (12a) means that students buy their meals at student dining hall and it does not matter where they actually eat their meals. Thus the students' meals are affiliated with the student dining hall. In (12b), however, it has to be the case that Zhangsan eats his meal inside a student dining hall and it is possible that he may have bought his meal somewhere else. I believe that this difference can be better explained if we distinguish the two phrases *Xúeshēng-shítāng-lí* and *Xúeshēng-shítāng*.

The most important piece of evidence for a syntactic distinction of the two phrases comes from the following examples. As has been noted earlier, both LocPs and NPs can function as the object of the verb. However, I must also point out that different verbs require different phrases as their object. Examine the following.

(13) a. Zhāngsān tiàozài-le zhuōzi-shàng.
Zhangsan jump-at-PER table-top.
'Zhangsan has jumped onto the table.'

b. *Zhāngsān tiàozài-le zhuōzi.
Zhangsan jump-at-PER table.

(14) a. Zhāngsān bǎihǎo-le zhuōzi.
Zhangsan set-good-PER table.
'Zhangsan has set up the table.'

b. *Zhāngsān bǎihǎo-le zhuōzi-shàng.
Zhangsan set-good-PER table-top.

Thus if we only treat LocPs as a special kind of NP, this subcategorization phenomenon cannot be explained.

5.2. The Characteristics of Locative Phrases

In the last section I have shown evidence that locative phrases are needed as a different syntactic category so that the different interpretations involving the two phrases can get a better explanation. In this section I will examine this category in its various aspects. In order to distinguish the locative phrase defined here from previous approaches, I abbreviate it as LP.

5.2.1. The Physical Components of LP

In most cases, we can tell the difference between an LP from an NP by looking at the locative endings that are unique to the LPs. For instance, some of the commonly occurring endings are *-lí* as in *jiā-lí* 'inside the home', *cānguǎn-lí* 'inside the restaurant', and *shūbāo-lí* 'inside the bookbag', *-shàng* as in *zhuōzi-shàng* 'on the table', *dǐbǎn-shàng* 'on the floor', and *qiáng-shàng* 'on the wall', *-xià* as in *shù-xià* 'under the tree', *chuángdi-xià* 'under the bed', and *yángguāng-xià* 'in/under the sunshine', and *-zhōng* as in *rénqun-zhōng* 'among the crowd', *shùlín-zhōng* 'amidst the trees', and *bǎimáng-zhōng* 'amidst the busy schedules'. Other endings that we often see include *-biān* 'along the side of', *-wài* 'outside', *páng* 'on the side of', The following examples illustrate the occurrences of LPs with these endings.

(15) a. Chítáng-páng yǒu yí-ke sōngshù.
pond-side have one-CL pine-tree
'There is a pine tree on the side of the pond.'

b. Zhāngsān bǎ yí-ke sōngshù zhòngzài lù-biān
Zhangsan BA one-CL pine-tree plant-at road-side
'Zhangsan plants a pine tree on the side of the road.'

c. Xiǎotōu bǎ qiánbāo chángzài shùlín-zhōng
small-thief BA money-bag hide-at trees-middle
'The pickpocket hides the wallet amidst the trees.'

d. Chūdōng shíjie rénmen bǎ xīguā fàngzài chuángdǐ-xià
begin-winter time-season people BA watermelon put-at bed-bottom-under
'In early winter, people store their watermelon under the bed.'

e. Xiàyǔtiān gèren-men dōu bǎ xiézi tuōzài mén-wài
fall-rain-day guest-PL all BA shoe take-off-at door-outside
'During rainy days, all the guests take off their shoes and put them outside the door.'

Although I have described most of the LPs as NPs with locative endings, we must admit that in Chinese there are some words that refuse those endings, for example, place names, i.e. *Běijīng* 'Beijing', *Wūlùmùqi* 'Urumqi', and *Zhōngguó* 'China'. In the

following examples, however, we can see that these proper names function just as if they are LPs.

(16) a. Gōngyuán-lǐ/mén-wài/lù-biān yǒu xǔduō wàiguórěn.
park-inside/door-outside/road-side have many foreigner
'There are a lot of foreigners in the park/outside the door/along the side of the road.'

b. Běijīng-(*lǐ)/Zhōngguó-(*wài)/Wūlùmùqi-(*biān) yǒu xǔduō wàiguórěn.
Beijing-inside/China-outside/Urumqi-side have many foreigner
'There are a lot of foreigners in Beijing/China/Urumqi.'

(17) a. Zhangsān bǎ chē tíngzài gōngyuán-*(lǐ)/mén-*(wài)/lù-*(biān).
Zhangsan BA car park-at park-inside/door-outside/road-side
'Zhangsan parks his car inside the park/ouside the door/on side of the road.'

b. Zhangsān bǎ chē tíngzài Běijīng-(*lǐ)/Zhōngguó-(*wài)/Wūlùmùqi-(*biān).
Zhangsan BA car park-at Beijing-inside/China-outside/Urumqi-side
'Zhangsan parks his car in Beijing/China/Urumqi.'

Thus I assume that by being a proper place name these NPs can be converted into LPs simply without the help of any phonologically realized endings. That is, they are ambiguous between NPs and LPs.[2] Now the question is what do we do when we need to express the idea 'outside Beijing' and 'inside Urumqi' in Chinese. This can be done by converting the proper place name nominals into common compound words like ***běijīng-chéng*** 'the city of Beijing' and ***wūlùmùqi-shì*** 'the city of Urumqi'. Then we can affix the normal locative endings to the compounds such as ***běijīng-chéng-lǐ*** 'inside Beijing (city)' and ***wūlùmùqi-shì-wài*** 'outside Urumqi (city)'.

5.2.2. The Semantics of LP

We have seen that the components of an LP are an NP and a locative ending. The meaning of the LP is a space that is related to the NP. This is about the same situation as for locative expressions in languages such as English, where locatives are usually expressed through prepositional phrases (PPs). A general discussion of the meaning of a locative PP in English can be found in Jackendoff (1972) and (1987), where a preposition is argued to be a functional head that subcategorizes for an NP. The semantic function of the preposition in a locational prepositional phrase is a functor that takes an NP and maps it into a location that is related to the NP. Thus in a phrase like *in the bookbag*, the preposition *in* takes an NP *the bookbag* and maps it into a space that is inside the bookbag. In the same way, *under* maps *the dictionary* into the space under the dictionary in the phrase *under the dictionary*.

2 Alternatively, we might posit a phonologically null ending which is combined with a place name NP to make it into an LP. As the above examples show, this null ending is semantically equivalent to *-lǐ* 'in'

In Chinese, the function of locative expressions is taken over by LPs. The semantic function of a locative preposition in English is assumed by a locative ending in Chinese. Therefore I suggest that the locative endings be the functional head that takes an NP and maps it into a related space. Thus for the phrase ***shùbāo-lǐ*** , it is the ending *-lǐ* 'inside' that maps the NP ***shùbāo*** 'bookbag' into the space that is inside the bookbag. Likewise, for the phrase ***wūlùmùqi-shì-wài*** , the ending *-wài* 'outside' takes the NP ***wūlùmùqi-shì*** 'the city of Urumqi' and maps it into the space that is outside of the city of Urumqi.

5.2.3. The Syntactic status of LP

I have proposed that locative endings in Chinese be treated as the semantic functor of the LP. This may have facilitated the early argument (Tai 1973) that these endings are actually postpositions in Chinese. One of the earlier objections to the postpositional treatment of these endings, that Chinese cannot be prepositional and postpositional at the same time, is no longer a problem in our approach. This is because most of the so-called prepositions such as ***zài*** and ***dào*** are argued to be markers. That is, Chinese is a postpositional language rather than a prepositional one.

There is, however, some difference between the English prepositions and Chinese postpositions. For one thing, Chinese postpositions do not have a free morpheme status as the English prepositions do. The locative endings are generally considered to be suffixes (Dai 1992), because they never occur as independent words. Chinese NPs are strictly head-final and therefore it is very hard to have any direct evidence to tell whether these endings should be treated as word suffixes or phrasal suffixes. However, there is indirect evidence to show that these suffixes are phrasal rather than nominal.

One piece of evidence lies in classifier-noun agreement. Classifiers normally only occur in nominal phrases and have to agree with the head noun (Gao 1994, Tang 1990) and this agreement has to be strictly honored in all NPs where classifiers are used.

(18) a. nèi-miàn/*zhāng/*běn qiáng
that-CL/CL/CL wall
'that wall'

b. nèi-zhāng/*miàn/*běn zhuōzi
that-CL/CL/CL table
'that table'

c. nèi-běn/*zhāng/*miàn shū
that-CL/CL/CL book
'that book'

Please also note that LPs belong to a different syntactic category than NPs. This is because neither of them can freely replace the other in certain positions in a sentence. Examine the following.

(19) a. Zhāngsān bǎ nèi-fu huà guàzài-le qiáng-shàng/*qiáng.
Zhangsan BA that-CL painting hang-at-PER wall-top/wall
'Zhangsan has hung that painting on the wall.'

b. Zhāngsān bǎ nèi-fu huà bǎizài-le zhuōzi-shàng/*zhuōzi.
Zhangsan BA that-CL painting place-at-PER table-top/table
'Zhangsan has placed that painting on the table.'

c. Zhāngsān bǎ nèi-fu huà fàngzài-le shū-shàng/*shū.
Zhangsan BA that-CL painting put-at-PER book-top/book
'Zhangsan has put that painting on the book.'

(20) a. Zhāngsān lěiqǐ-le yī-miàn qiáng/*qiáng-shàng.
Zhangsan build-up-PER one-CL wall/wall-top
'Zhangsan has built up a wall.'

b. Zhāngsān mǎi-le xǔduō zhuōzi/*zhūozi-shàng.
Zhangsan buy-PER many wall/wall-top
'Zhangsan has bought many tables.'

c. Zhāngsān yǒu hěnduō shū/*shu-shàng.
Zhangsan have very-many book/book-top
'Zhangsan has a lot of books.'

In (19) all the verbs require an LP as their object and an NP in that position is not acceptable. In (20), it is just the opposite: all the verbs require an NP as their object and substituting with an LP just makes these sentences ungrammatical.

One way to build different phrases is to start different projections with separate lexical heads, such as VPs and NPs. In our case, the LP has to start with a locative head and the head of an NP has to be a nominal. We can have a locative word if we assume that the locative endings are word level affixes, for all we need to do under such assumption is just affix the suffixes to the nominals and then we have locative words. If this were so, we should not expect the classifiers to occur in LPs, given that classifiers only occur within NPs and have to agree with the head nouns. This prediction is proven wrong in the following LP expressions.

(21) a. nèi-miàn/*zhāng/*běn qiáng-shàng
that-CL/CL/CL wall-top
'on that wall'

b. nèi-zhāng/*miàn/*běn zhuōzi-shàng
that-CL/CL/CL table-top
'on that table'

c. nèi-běn/*zhāng/*miàn shū-shàng
that-CL/CL/CL book
'on that book'

The fact that the expressions in (21) are acceptable raises at lease the following questions. If *qiáng-shàng, zhuōzi-shàng,* and *shū-shàng* are really the heads of the LPs, what do the classifiers agree with? Recall that the classifiers have to agree only with a nominal head, but after attaching the locative affix to the nominals *qiáng* 'wall', *zhuōzi* 'table', and *shū* 'book', they are no longer nominals. They become locatives. Indeed we might wonder why the classifiers occur at all since the expressions are LPs, not NPs.

The acceptability of (21) also rules out the analysis that these expressions are just a different kind of NP. For if they were NPs, they would have to be headed by nominals. That is to say, we must treat *qiáng-shàng, zhuōzi-shàng,* and *shū-shàng* as the head nouns. However, they must also have different semantic references since they now denote spaces rather than the referents before *shàng* is attached to them. If this is the case, then we should expect the classifiers for *qiáng-shàng, zhuōzi-shàng,* and *shū-shàng* to be the same but different from those for *qiáng* 'wall', *zhuōzi* 'table', and *shū* 'book'. This is because in classifier languages, different classifiers are required for objects with different shapes, qualities, or categories. For instance, for the word *qiángjiǎo* 'corner of the wall', the classifier is *gè* not *miàn*. For the word *zhuōzi tuǐ* 'a leg of the table', the classifier has to be *tiáo* not *zhāng*. This is shown in the following in comparison with (18).

(22) a. nèi-gè/*miàn/*zhāng/*běn qiángjiǎo
that-CL/CL/CL/CL wall-corner
'that corner of the wall'

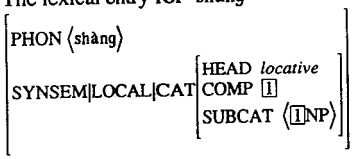
b. nèi-tiáo/*zhāng/*miàn/*běn zhuōzituǐ
that-CL/CL/CL/CL table-leg
'that leg of the table'

c. nèi-zhāng/*běn/*miàn shūpí
that-CL/CL/CL book-wrapper
'that wrapper of the book'

Thus different nouns must have different classifiers. The cases in (21), therefore, show that the classifiers used are not for the locative nouns. They can be best explained if we assume that the locative ending is added only after the head nouns have projected to NPs by combining with their classifiers

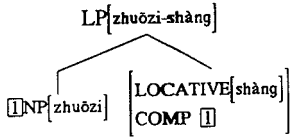
I have shown that semantically the locative endings behave just like the English locative prepositions. They take NP's and map them into related spaces. Syntactically, they combine with NP's to form a category that is different from NP's. However, they are not independent words since they never occur alone. Thus we conclude that the locative suffixes have the syntactic function of a postposition with the morphological status of a clitic. Thus, the lexical entry for a locative ending is as follows.

(23) The lexical entry for *-shàng*



Then the structure of ***zhuōzi-shàng*** 'on the table' is as in (24)

(24) The structure of ***zhuōzi-shàng*** 'on the table'



5.3. The Analysis with LP

5.3.1. Postverbal Subcategorization

At the begining of this Chapter, I listed some examples that violate the direct mapping principle from the ordered argument list to the linear order in sentential phrase structure. The examples are repeated here.

(5) a. Zhāngsān bǎ zìjǐ de dàyi guàzài-le yījià-shàng.
Zhangsan BA self DE big-coat hang-at-PER clothes-rack-top
'Zhangsan has hung his own overcoat on the clothes rack.'

b. *Zhāngsān zài yījià-shàng guàzài-le zìjǐ de dàyi.
Zhangsan ZAI clothes-rack-top hang-at-PER self DE big-coat

In (5), as I have pointed out earlier, *dàyi* 'overcoat' has the patient role and therefore is the most patient-like argument and the first in line to take the object position. However, (5) shows that with the verb ***guàzài-le*** the argument with locative role takes the object position, not the the patient. Now with the distinction between LP and NP, I can explain this violation with the help of subcategorization theory.

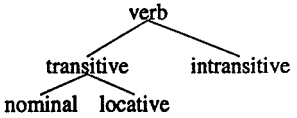
In syntax, subcategorization refers to the ability that a lexical item has in selecting its arguments. Thus it is generally assumed that verbs like *eat* subcategorize for a noun phrase (NP) as its object while verbs like *depend* subcategorize for a prepositional phrase (PP). The grammaticality of a sentence is therefore partially dependent on whether the subcategorization frame of the verb is satisfied, as can be shown in the following examples.

(25) John eats bananas/*on bananas.

(26) John depends *bananas/ on bananas..

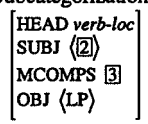
Thus in (25) the verb *eat* requires an NP as its object and substituting with a PP *on bananas* results in unacceptability of the sentence. The verb *depend* in (26), on the other hand, selects a PP as its object and the NP *bananas* in this position only makes the sentence ungrammatical. In light of this line of argument, I also suggest that the ungrammaticality of (5b) is the result of subcategorization conflict. I propose that the verb ***guàzài-le*** in (5) belongs to the subsort of locative verbs, which, in turn, are a subsort of transitive verbs.[3] The sort hierarchy of a verb is shown as (27).

(27)



A locative verb, abbreviated as *verb-loc* in lexical entries, is defined to have the following subcategorization frame.

(28) Subcategorization frame for *verb-loc*



From (28) we see that the object position of a locative verb can only be filled with an LP. Since ***guàzài-le*** is a locative, it must take ***yījià-shàng***, the only LP on the SUBCAT list, as its object, and substituting with an NP results in the unacceptabilty of the sentence, as is shown in (5b). Please note that changing the LP ***yījià-shàng*** 'on the clothes rack' to the NP ***yījià*** 'clothes rack' also results in ungrammaticality, as is shown in (29).

(29) *Zhāngsān bǎ zìjǐ de dàyi guàzài-le yījià.
Zhangsan BA self DE big-coat hang-at-PER clothes-rack

To explain these facts, I assume that the subcategorization requirement takes priority over the argument hierarchy when there is conflict between the two. As soon as the conflict is resolved, the rest of the arguments will still follow the argument selection principle. Thus, with the verb ***guàzài-le***, the conflict is on the object position. As soon as an LP is selected to fill that position, the rest of the arguments will take their otherwise normal arrangement. That is, the most agent-like NP ***Zhāngsān*** will serve as the subject. In the absence of ***Zhāngsān***, the next most agent-like NP, in this case, the patient, *dàyī* 'overcoat' can serve as the subject. Hence the following:

[3] See Chapter Six for definitions of transitivity of verbs used in this thesis.

(30) Dàyī guàzài-leyījià-shàng
big-coat hang-at-PER clothes-rack-top
'The overcoat is hung on the clothes rack.'

In the last chapter I have shown that *guà* is a different verb from the compound verb *guàzài* we have seen here. They are different also because they show different subcategorization frames. While the compound verb *guàzài* requires a postverbal LP object, the verb *guà* only select an NP as its unmarked complement. In the sort hierarchy of verbs, it belongs to the nominal transitive verbs. A nominal transitive verb, abbreviated as *verb-nom* in the lexical entries, is defined to have the following subcategorization frame.

(31) the subcategorization frame for *verb-nom*

$$\begin{bmatrix} \text{HEAD } \textit{verb-nom} \\ \text{SUBJ } \langle \boxed{2} \rangle \\ \text{MCOMPS } \boxed{3} \\ \text{OBJ } \langle \text{NP} \rangle \end{bmatrix}$$

According to (31), we expect that, for a verb like *guà*, only an NP can take the object position, and substituting with an LP will result in its ungrammaticality. However, for the subject position the selection requirement is not so strict, and either an LP or an NP can fill that position as long as it is the most agent-like argument. This prediction is borne out in the following.

(32) a. Zhāngsān zài yījià-shàng guà-le yī-jiàn dàyī.
Zhangsan ZAI clothes-rack-top hang-PER one-CL big-coat
'Zhangsan has hung an overcoat on the clothes rack.'

b. *Zhāngsān bǎ yī-jiàn dàyī guà-le yījià-shàng.
Zhangsan BA one-CL big-coat hang-PER clothes-rack-top

c. Zhāngsān guà-le yī-jiàn dàyī.
Zhangsan hang-PER one-CL big-coat
'Zhangsan has hung an overcoat.'

d. Yījià-shàng guà-le yī-jiàn dàyī.
clothes-rack-top hang-PER one-CL big-coat
'An overcoat is hung on the clothes rack.'

5.3.2. Marked Complements

As has been shown earlier, both LPs and NPs can serve as the object of the so-called preposition *zài* but with a different semantic denotation. It must be pointed out that this is not true with all NPs. In our analysis with *zài* as a marker, *zài* is generated in the syntax to indicate that a preverbal argument fills a locative semantic role. There are two different ways a location can be denoted: by an LP or by an NP denoting a place like *xuéxiào* 'school' or *shāngdiàn* 'store'. Other NPs like *shū* 'book' or *kuàizi* 'chopsticks' do not denote places and therefore cannot be marked with *zài*. In the traditional analysis, this

means that those NPs cannot serve as the object of the preposition *zài*. This is shown in the following examples.

(33) a. Zhāngsān zài xuéxiào(-lǐ)/shāngdiàn(-lǐ) gōngzuò.
Zhangsan ZAI school-inside/store-inside work
'Zhangsan works for/inside the school/the store.'

b. Zhāngsān kěyi zài shū-*(shàng)/kuàizi-*(shàng) xiě zì.
Zhangsan can ZAI book-top/chopsticks-top write word
'Zhangsan can write on the books/chopsticks.'

Even though in preverbal marked complement positions, the location argument tolerates both LPs and NPs, the postverbal object position is still very sensitive to the distinction between the two. Recall that it has been shown that if the most patient-like argument is absent, the next most patient-like argument will assume the object position if the the verb requires an unmarked complement. This is again illustrated in the following.

(34) a. Zhāngsān yīnggai zài shítáng chī fàn.
Zhangsan must ZAI dining-hall eat meal
'Zhangsan must subscribe his meal with the dining hall.'

b. Zhāngsān yīnggai zài shítáng-lǐ chī fàn.
Zhangsan must ZAI dining-hall-inside eat meal
'Zhangsan must eat his meal inside the dining hall.'

c. Zhāngsān yīnggāi chī shítáng.
Zhangsan must eat dining-hall
'Zhangsan must subscribe (his meal) with the dining hall.'

d. *Zhāngsān yīnggāi chī shítáng-lǐ.
Zhangsan must eat dining-hall-inside
'Zhangsan must have his meal in the dining hall.'

In (34) when the verb *chī* 'eat', which is a nominal transitive verb, has three arguments, *fàn* 'meal' is the most patient-like and it takes the object position. However, when *fàn* 'meal' is missing, the location argument becomes the most patient-like. Even though the location argument tolerates both categories because of the (partial) overlapping of the semantic denotations of *shítáng* 'the dining hall' and *shítáng-lǐ* 'inside the dining hall', the subcategorization frame of the verb *chī* requires that its object position be filled only with an NP. Thus, of the two location-denoting categories, only the NP *shítáng* can fulfil the requirement. Hence the unacceptability of (34b) when *shítáng-lǐ* is used as the unmarked complement. Therefore I have again shown that distinction between LP and NP in Chinese is necessary and it can offer an explanation of the sentential ordering in the phrase structure.

5.3.3. The Subject

At the begining of the chapter I also showed that both NPs and LPs can function as the subject. However, there is also a difference between an LP subject and an NP subject and this difference can now be explained by the distinction between the two. let's start our analysis by re-examining the difference between the two kinds of subject in the following examples.

(35) a. Nèi-zhang zhuōzi-shàng shǎo-le sān-tiáo tuǐ.
that-CL table-top fewer-PER three-CL leg
'There are three fewer legs on that table.'

b. Nèi-zhang zhuōzi shǎo-le sān-tiáo tuǐ.
that-CL table fewer-PER three-CL leg
'That table has three fewer legs.'

(36) a. Xuéshéng shítáng-lǐ lái-le yí-wèi xīn jīnglǐ.
student dining-hall-inisde come-PER one-CL new manager
'There is a new manager inside the student dining hall.'

b. Xuéshéng shítáng lái-le yí-wèi xīn jīnglǐ.
student dining-hall come-PER one-CL new manager
'The student dining hall now has a new manager.'

The sentences in (35) form a minimal pair in the use of LP and NP in the subject position. In (35b) the relation between the legs and the table is clearly understood as the one between the possessed and possessor. That is, the legs in (35b) are said to belong to the table. Thus, if we assume that the standard number of legs for a table is four, then (35b) is understood to mean that the table has only one leg now. This kind of relation, however, is missing in (35a). This kind of relation is also present in (36): the new manager is said to take charge of the student dining hall in (36b) but there is no such an affiliation in (36a).

Recall that in the last chapter I follow Li (1990)'s suggestion in the analysis of inalienable object constructions by assuming that there is an empty category pro denoting the possessor within the inalienable object NP. This empty category must be bound by the first available o-commanding argument of the object so that the correct interpretation of the sentence can be reached. I repeat the example below.

(37) a. Zhāngsān shuāiduàn-le yì-tiáo tuǐ.
Zhangsan throw-break-PER one-CL leg
'Zhangsan has broken one of his legs (by falling down).'

b. Zhāngsān bǎ nèi-zhāng zhuōzi shuāiduàn-le yì-tiáo tuǐ.
Zhangsan BA that-CL table throw-break-PER one-CL leg
'Zhangsan has broken one of the table's legs (by letting it fall).'

If we assume the empty category pro within the NP *yì-tiáo tuǐ*'a leg', then the correct interpretation can be reached by locating the available binders of the pro in each of the sentences in (37): for the (a) example, the o-commanding co-argument is the subject NP

Zhāngsān and therefore we understand that the leg belongs to *Zhāngsān*. In the (b) sentence, however, the first o-commanding co-argument is *nèi-zhāng zhuōzi* 'that table' and therefore we understand the leg belongs to the table.

Now let's look at (35). Here we again see the inalienable object *sān-tiáo tuǐ* 'three legs'. Let's again assume that there is an empty category pro within this NP and it must be bound by the first available binder. In our analysis, this seems very apparent: in (35b) the binder is the subject NP because it is the first o-commanding argument for the object. Thus we have the interpretation that the three legs are a part of the table. In (35a), however, the subject is an LP, and the NP within the subject can no longer o-commmand the object because it is embedded inside the LP. Thus the empty category pro is no longer bound by *nèi-zhāng zhuōzi* 'that table' and therefore there is no clear relationship between the three legs and the table.

For the sentences in (36), the assumption of the existence of the empty category pro is also justified by the understanding that the position of manager is always associated with some social organization like *fànguǎn* 'a restaurant' or *shāngdiàn* 'a store'. Thus, it is not unreasonable that these positions be treated the same as the relational nouns such as *brother* and *father*. Once the pro is set within the NP *yí-wèi xīn jīnlǐ* 'a new manager', the anaysis is the same as in (35).

However, the above analysis is not a straightforward application of the HPSG binding principles proposed in P&S 1992. This is because the participants in the binding principles are arguments and the subject position in all examples in (35) and (36) is held by an argument. That is, if the only requirement for a potential binder for the pro is a less oblique co-argument, as is stated in the HPSG binding principles, both NP and LP in the subject position in (33) and (34) should be able to bind the pro within the object position. However, if, in addition to the obliqueness heirarchy, we also require that the syntactic categories of the binder and anaphoric expressions are the same, then the difference between the (a) and (b) sentences in both (35) and (36) can be explained within the o-commanding relations.

The same-category requirement is not new in this paper. In the previous chapter, we have seen the following example.

(38) a. [Wǔ-gè[píngguǒ$_i$]$_{N'}$]$_{NP}$ làn-le [sān-gè[e$_i$]$_{N'}$]$_{NP}$.
five-CL apple rot-PER three-CL
'Three of the five apples have rotted.'

Here in (38) an empty category is posed within the object position. I argued that this empty category is an N' and it should be bound only by an N' in a less oblique co-argument. This helped us to get the desired interpretation in (38).

In the current case, the empty category pro is designed to function as a possessive, and we have seen this position is filled with NPs such as *yī-tiáo zhuōzi (de) tuǐ* 'a leg of the table' and *Zhāngsān de yītiáo tuǐ* 'one of Zhangsan's legs'. Furthermore, we have also seen that this pro can be bound by an NP in (37). In the following example, we see that the pro can only be bound by an NP, not an LP.

(39) b. Zhāngsān$_i$ zài zhuōzi-shàng$_j$ shuāiduàn-le pro$_{i/*j}$ yī-tiáo tuǐ.
Zhangsan BA that-CL table throw-break-PER one-CL leg
'Zhangsan has broken one of his/*the table's legs on the table.'

In (39) the first available co-argument to bind the pro in the object position is the locative *zhuōzi-shàng* 'on the table', which is an LP. But this LP fails to be the binder. Instead, the pro finds the subject NP to be its binder. Thus I propose that the possessive empty category must be bound by the first o-commanding NP argument.

Now let's go back to (35a) and (36a). The subject in these two cases fails to be the binder for the pro in the object position because these arguments are LPs, not NPs. They are not compatible with the description of the binder that is required to be an NP. There is an NP within the subject position but this NP,too, fails to be the binder. This is because the NP is not an co-argument of the object. It is only an argument within the subject LP, which is the only co-argument of the object in (35a) and (36a). This is shown as (35c-d) and (36c-d) below.

(35) c. [[Nèi-zhang zhuōzi]$_{NP_i}$-sàng]$_{LP_j}$ shǎo-le [pro$_{*i/*j}$ sān-tiáo tuǐ]$_{NP}$
that-CL table-top fewer-PER three-CL leg
'There are three fewer legs on that table.'

b. [Nèi-zhang zhuōzi]$_{NP_i}$ shǎo-le [pro$_i$ sān-tiao tuǐ]$_{NP}$
that-CL table fewer-PER three-CL leg
'That table has three fewer legs.'

(36) c. [[Xuéshéng shítáng]$_{NP_i}$-lǐ]$_{LP_j}$ lái-le [pro$_{*i/*j}$ yī-wèi xīn jīnlǐ]$_{NP}$
student dining-hall-inisde come-PER one-CL new manager
'There is a new manager inside the student dining hall.'

b. [Xuéshéng shítáng]$_{NP_i}$ lái-le [pro$_i$ yī-wèi xīn jīnlǐ]$_{NP}$
student dining-hall come-PER one-CL new manager
'The student dining hall now has a new manag.'

Since the pro in (35c) and (36c) fails to find its binder within the clause (=the subject saturated VP), it must look elsewhere. This same analysis can be extended to the LP argument in (39).

5.4. Conclusion

In this chapter, I have argued for a syntactic distinction between NPs and LPs in Chinese. I have shown that this distinction is not only necessary but also beneficial to the analysis of

the language. I have also shown that the head of the LP is a postposition-like locative affix and it subcategorizes for an NP. The different syntactic categories of NP and LP allow us to understand their different behaviors in phrase structures. For instance, the following sentence was shown in the last chapter to be an apparent exception to the argument selection principle between argument structure and phrase structure.

(40) Zhāngsān bǎ yī-fù huà bǎizài-le zhuōzi-shàng.
Zhangsan BA one-CL painting place-at-PER table-top
'Zhangsan has placed a painting on the table.'

But the distinction between the LP and NP helps us to successfully explain why the exception is not a counterexample to our analysis: the subcategorization frame imposes a stricter restraint on the phrase structure and overrides the direct argument selection when conflicts arrises.

The distinction is incorporated into the binding principles and we now understand why LP arguments are generally not permitted to serve as binders for their more oblique co-arguments and why the NPs inside them cannot bind their more oblique co-arguments, either.

In the next chapter we will have a closer look at the phrase structures in Chinese with an eye on other syntactic issues in the Chinese grammar.

Chapter 6

PHRASE STRUCTURE

6.0. Introduction

A very important aspect of phrase structure is how the arguments of a verb are arranged in the sentence. For instance, we need to locate the positions of the subject as well as the object if the verb is transitive. In an SVO or head-initial language, the subject usually is found to be in front of the verb phrase, as in English and French in the following examples. Since they are SVO languages, we generally find the object to be postverbal.

(1) John ate an apple.

(2) Jean a mangé une pomme.
Jean has eaten an apple
'Jean ate an apple.'

Languages like Japanese and Korean, on the other hand, are SOV languages and therefore the phrase structure of these languages must include the fact that the object in these languages must always appear before the verb.

(3) Taroo-ga ringo-o tabeta
Taroo-NOM apple-ACC ate
'Taroo ate an apple.'

(4) Nay-ka sakwa-lul mekessta
I-NOM apple-ACC ate
'I ate an apple.'

However, when it comes to Chinese, it becomes a complicated issue due to the fact that Chinese allows the same argument to be either postverbal or preverbal. The high flexibility in Chinese phrase structure has caused quite a debate in the literature. Here is a pair of sentences.

(5) a. Zhāngsān chī-le yí-ge píngguǒ.
Zhangsan eat-PER one-CL apple
'Zhangsan ate an apple.'

b. Zhāngsān bǎ yí-gě píngguo chī-le.
Zhangsan BA one-CL apple eat-PER
'Zhangsan ate an apple.'

In this Chapter, I will have a closer look at this debate and argue for an SVO anaysis. The alternation in (5) will be shown to depend on whether the verb is transitive. Constraints will be proposed to predict the range of possible alternations.

6.1 SOV or SVO?

In traditional terms, a transitive verb is a verb capable of taking an object (or objects). And in the same way an intransitive verb is one that does not take any object. However, this seemingly simple classification of verbs may cause a lot confusion in Chinese since Chinese syntax tolerates varieties of phrase structures. For instance, the alternation of *bǎ* and non-*bǎ* structures has caused a debate for decades over whether Chinese should be treated as a SOV or SVO language.

In transformational models of grammar (Thompson 1973b, Cheung 1973, Chang 1989, Hashimoto 1964, Li and Thompson 1981, Goodall 1987, Chao 1982, Gao 1994), the *bǎ*-phrase is analyzed as the fronted object. That is, the object is base-generated in a postverbal object position and then fronted together with *bǎ*. Thus verbs that are used in structures that allow object fronting must all be transitive, and it is assumed in these approaches that Chinese is an SVO language. The word *bǎ*, which functions as an object-fronter, is treated either as a preposition ((Thompson 1973b, Cheung 1973, Hashimoto 1964, Li and Thompson 1981, Chao 1982) or as a secondary topic marker (Tsao 1987, Gao 1994). Various restrictions have been proposed in these analyses to account for structures that do not allow the *bǎ*-phrase alternation. Problems, however, remain as why there are cases where *bǎ*-phrase alternations are found without the source non-*bǎ* sentences and vice versa.

The approaches that treat *bǎ* as a verb vary on this issue. The light verb analysis (Huang 1991, Ding 1994) holds that the object is base-generated to the left of the verb but then the verb has to move to the left of the argument in order to assign Case or a light verb *bǎ* has to be inserted to the left of the object to assign Case to it. This analysis suggest that Chinese is underlyingly an SOV language. Yang (1995) suggests that *bǎ* is the main verb and it subcategorizes for a resultative clause (or an object and a resultative verb phrase), implying that Chinese is an SVO language. Both analyses have been argued in Chapter 3 to be problematic.

Tai (1973) observes that there is a parallelism between the *bǎ*-phrase structure and *bèi*-phrase structure in Chines. Since the *bèi*-phrase structure is generally recognized as the passive voice and the *bǎ*-phrase seems to function as the base-generated structure to feed the passive, he claims that Chinese should be treated as an SOV. The problem with this

suggestion is that, as we have shown in previous chapters, other preverbal phrases such as *zài*-phrases and *yòng*-phrases also feed passives and it hasn't been assumed in previous literature that these phrases are also objects.

Travis (1984) picks up Tai (1973)'s proposal and gives it a theory-internally motivated explanation. She suggests that Chinese verbs assign theta role to the left and Case to the right, hence treats Chinese as an underlying SOV language. Under this analysis, the object of a verb is base-generated to the left of the verb. Then it has the options to stay or to move to the right of the verb. If it stays, a Case marker *bǎ* will be inserted and the Case Filter is satisfied. If it chooses to move, the verb will assign an (abstract) Case to it and the Case Filter is also satisfied. The problem with this analysis, I believe, is the optionality itself. I noted earlier that there are cases where a *bǎ*-phrase does not have the alternate VO structure and there are other cases where a VO structure does not have *bǎ*-phrase alternation. In the first case, we have to state that for these verbs, the inability of the object to move to the right of the verb is a consequence of the fact that these verbs do not have Case to assign. In the latter case, we must claim that these verbs have a Case to assign and some principle is violated if the Case is not assigned. If this is the solution for the non-alternating cases, then there is a problem in describing verbs that have the option to either assign a Case or not assign a Case. This seems to be a lexical rather than a syntactic property of individual verbs. Besides, as has been shown in Gao 1992, similar alternations between unmarked postverbal NPs and otherwise marked NPs in preverbal position suggest that there are other possible case markers in Chinese. Then the case markers are no longer what Travis wants them to be because the different choices for case markers can be shown to correlate with semantic differences, and therefore need to be base-generated, not syntactically inserted.

The claim that Chinese is underlyingly an SOV language in recent aproaches is largely based on the suggestion that a verb in Chinese assigns its theta role to the left. That is, the internal argument of a verb is generated to the left of the verb. The problem with this claim is that not all internal arguments become the object. That is, the verb's ability to have an internal argument does not necessarily make it a transitive verb. For instance, an unaccusative verb is considered to have an internal argument but no accusative Case. As a result, the internal argument ends up in a subject position where it can get Case from the Tense. Thus, the unaccusative verb is standardly treated as an intransitive verb. This suggests that at least the underlying structure should not be taken as criterion for whether a verb is transitive or intransitive. Besides, the syntactic theory adopted in this paper is a

monostratal analysis of phrase structure and no consideration is given to underlying structures. This leads us to find other ways to clarify the notion of transitivity in verbs.

6.1.1. Transitives (the Verbs That Take Postverbal NP/LP Objects)

A transitive verb is generally recognized as a verb that is capable of taking an object or objects. In Chinese, two different analyses locate the object of a verb differently. Tai (1975) argues that the preverbal *bǎ*-phrase should be treated as the object of the verb. His arguments include the observation that there is a regular relation between the *bǎ*-phrase and the *bèi*-phrase. Examine the following.

(6) a. Zhāngsān bǎ Lǐsǐ dǎshāng-le.
Zhangsan BA Lisi hit-wound-PER
'Zhangsan has wounded Lisi.'

b. Lǐsǐ bèi Zhāngsān dǎshāng-le.
Lisi BEI Zhangsan hit-wound-PER
'Lisi has been wounded by Zhangsan.'

c. Zhāngsān dǎshāng-le Lǐsǐ.
Zhangsan hit-wound-PER Lisi
'Zhangsan has wounded Lisi.'

(7) a. Wángwǔ bǎ qìchē mài-le.
Wangwu BA car sell-PER
'Wangwu has sold the car.'

b. Qìchē bèi Wángwǔ mài-le.
car BEI Wangwu sell-PER
'The car has been sold by Wangwu.'

c. Wángwǔ mài-le qìchē.
Wangwu sell-PER car
'Wangwu has sold the car.'

The argument is modelled on the assumption that in English the process of passivization always takes the object of the verb and makes it the subject while the original subject becomes the *by*-phrase. Thus in Chinese the passive sentences are the (b) examples in (6) and (7). We can see that the subjects of the passives are just the *bǎ*-phrases in the (a) examples. Therefore it seems reasonable that the *bǎ*-phrases must be treated as the objects in each (a) sentences.

This analysis, however, raises more questions than it answers. I have discussed passivization in previous chapters and shown that *bǎ*-phrases are not the only preverbal elements that allow passivization. For instance, other marked complements such as phrases marked by *zài* and *yòng* can also be passivized, as is shown in the following.

(8) a. Lǐsǐ zài hēibǎn-shàng xiěmǎn-le zì.
Lisi ZAI blackboard-on write-full-PER word
'Lisi has written all over the blackboard.'

b. Hēibǎn-shàng bèi Lǐsì xiěmǎn-le zì.
blackboard-on by Lisi write-full-PER word
'Lisi has written all over the blackboard.'

c. *Lǐsì bǎ zì xiěmǎn-le hēibǎn-shàng.
Lisi BA word write-full-PER blackboard-on

(9) a. Lǐsì gěi Wángwǔ wǎng jiā-lǐ jǐ-lǐ yī-mei zàdàn.
Lisi GEI Wangwu WANG home-inside mail-PER one-CL bomb
'Lisi mailed a bomb to Wangwu at his home.'

b. Wángwǔ bèi Lǐsì wǎng jiā-lǐ jǐ-lǐ yī-mei zàdàn.
Wangwu BEI Lisi WANG home-inside mail-PER one-CL bomb
'Wangwu was mailed a bomb by Lisi to his home.'

c. *Lǐsì bǎ yī-mei zàdàn wǎng jiā-lǐ jǐ-lǐ Wángwǔ.
Lisi BA one-CL bomb towards home-inside mail-PER Wangwu

d. Jiā-lǐ bèi Lǐsì gěi Wángwǔ jǐ-lǐ yī-mei zàdàn.
home-inside BEI Lisi GEI Wangwu mail-PER one-CL bomb
'Lisi mailed a bomb to Wangwu at his home.'

e. *Lǐsì bǎ yī-mei zàdàn gěi Wángwǔ jǐ-lǐ jiā-lǐ.
Lisi BA one-CL bomb GEI Wangwu mail-PER home-inside

10) a. Lǐsì cóng wǒmen xuéxiào tōuzǒu-le xǔduō dōngxi.
Lisi CONG our school steal-go-PER many thing
'Lisi has stolen a lot things from our school.'

b. Wǒmen xuéxiào bèi Lǐsì tōuzǒu-le xǔduō dōngxi.
our school by Lisi steal-go-PER many thing
'Lisi has stolen a lot things from (the) school.'

c. *Lǐsì bǎ xǔduō dōngxi tōuzǒu-le wǒmen xuéxiào.
Lisi BA many thing steal-go-PER our school

Thus, according to this analysis, the preverbal phrases with *zài* in (8), *gěi* and *wǎng* in (9), and *cóng* in (10) should all be treated as objects. However, this claim has never been made. The reason seems simple. Of those passivizable phrases in the above examples, only *bǎ*-phrases have the option of appearing postverbally, while others cannot.[1] This is shown in the above (c) and (e) sentences. This seems to suggest that the *bǎ*-phrases are treated as the object, not because they can be passivized, but because there is a relation between the *bǎ*-phrases and the postverbal non-*bǎ*-phrases. This pattern is recognized by Travis (1984), where she suggests that the postverbal objects should be treated as derived from the preverbal *bǎ*-phrases. However, even Travis' explanation cannot save this analysis. As has been pointed out in Gao (1992), there are verbs that allow the alternation of arguments in preverbal and postverbal positions, just like the *bǎ* and non-*bǎ* alternation. But these sentences cannot be passivized. Examine the following.

[1] As has been shown previously, not all *bǎ*-phrases can appear postverbally. Some preverbal non-*bǎ*-phrase may appear postverbally provided that they are the most patient-like arguments with certain transitive verbs.

(11) a. Wǒmen yào xuéxi Léi Féng.
we must learn Lei Feng
'We must learn from Lei Feng.'

b. Wǒmen yào xiàng/*bǎ Léi Féng xuéxi.
we must XIANG/BA Lei Feng learn
'We must learn from Lei Feng.'

c. *Léi Féng yào bèi wǒmen xuéxi.
Lei Feng must by we learn

(12) a. Lǐsì qù-le Měiguó.
Lisi go-PER USA
'Lisi has gone to the United States.'

b. Lǐsì dào/*bǎ Měiguó qù-le.
Lisi DAO/BA USA go-PER
'Lisi has gone to the United States.'

c. *Měiguó bèi Lǐsì qù-le.
USA by Lisi go-PER

With examples in (11) and (12), Travis' directionality theory faces insurmountable difficulties. For one thing, the assumption of *bǎ* as a dummy element only inserted later in surface structure is challenged by the existence of the same kind of elements in (11) and (12). Since *bǎ* is not the only dummy Case marker and it is not interchangeable with other Case markers, how do we determine when to insert these elements in the surface structure and which ones to insert? If we distinguish them by assigning different semantic roles to each, then they are not dummies anymore. Thus, Travis' analysis fails to offer any explanation for the above examples.

The examples in (11) and (12) also pose some problems for Tai's analysis in that we are even less sure now when to treat the preverbal arguments as objects. If we only treat the *bǎ*-phrases as objects, then the question is how we can justify this. This question has not been answered.

In a monostratal analysis, both structures are considered to be base-generated. However, we still need to distinguish verbs that take postverbal arguments from those that do not for the sake of defining phrase structures. I take the verbs with postverbal arguments as transitive verbs for the following reasons. First, I notice that verbs in Chinese generally have very tight restrictions on what can appear as a postverbal complement while the choice for preverbal complements are much freer. For instance, the verbs *bǎiman* 'put all over' and *chī* 'eat' require their postverbal complement to be only an NP, but their preverbal complement can be either an NP or an LP. This is shown in the following.

(13) a. Zhāngsān bǎ zhuōzi(-shàng) bǎimǎn-le shū.
Zhangsan BA table(-top) place-full-PER book
'Zhangsan has put books all over the table.'

b. Zhāngsān bǎ **shū** bǎimǎn-le zhuōzi(*-shàng).
Zhangsan BA book place-full-PER table(-top)
'Zhangsan has put books all over the table.'

(14) a. Zhāngsān tiāntian zài fànguǎn(-lǐ) chī fàn.
Zhangsan day-day ZAI restaurant(-inside) eat meal
'Zhangsan eats his meal in restaurants everyday.'

b. Zhāngsān tiāntian chī fànguǎn(*-lǐ).
Zhangsan day-day eat restaurant(*-inside)
'Zhangsan eats his meal in restaurants everyday.'

(15) Zhāngsān bǎ **shū** fàngzài-le zhuōzi-*(shàng).
Zhangsan BA book put-PER table-top
'Zhangsan has put the books on the table.'

Note also that in (15), the verb *fàngzài* 'put at' requires an LP as its postverbal argument and changing it to an NP results in unacceptability of the sentence.

Second, idioms involving a verb and an object always take the VO form. If the same complement appears in a preverbal position, the idiomatic interpretation disappears. Observe the following sentences.

(16) a. Zhāngsān chī-le Lìsì de cù.
Zhangsan eat-PER Lisi DE vinegar
a. 'Zhangsan was jealous of Lisi.'
b. 'Zhangsan has consumed Lisi's vinegar.'

c. Zhāngsān bǎ Lìsì de cù chī-le.
Zhangsan BA Lisi DE vinigar eat-PER
'Zhangsan has consumed Lisi's vinegar.'

(17) a. Zhāngsān dǎ-le yì-píng jiàngyóu.
Zhangsan hit-PER one-bottle soy-sauce
a. 'Zhangsan has bought a bottle of soy sauce'
b. 'Zhangsan has spilt soy sauce (by upsetting the bottle).'

b. Zhāngsān bǎ yì-píng jiàngyóu dǎ-le.
Zhangsan BA one-bottle soy-sauce hit-PER
'Zhangsan has spilt soy sauce (by upsetting the bottle).'

As can be seen in (16), the expression *chī cù* 'eat (somebody's) vinegar' carries a special meaning 'to be jealous (of someone)' besides the literal interpretation. However, this idiomatic interpretation is only available when the expression is in the VO form. The same is true of (17). In everyday speech, the verb *dǎ* 'hit' has an idiomatic meaning of 'buy'. Again this special interpretation disappears if the expression is not in the verb-object order. Thus we can infer from these examples that the unmarked form of transitive verb is to take a postverbal object.

The third piece of evidence comes from the semantic restrictions that the verb complements must have. Examine the following.

(18) a. Zhāngsān qílèi-le mǎ.
Zhangsan ride-tired-PER horse
a. 'Zhangsan rode on a horse and got tired.'
b. 'Zhangsan rode on a horse and got it tired.'

b. Zhāngsān bǎ mǎ qílèi-le
Zhangsan BA horse ride-tired-PER
'Zhangsan rode on a horse and got it tired.'

In Chinese a bare NP may have a generic reading or a referential[2] reading. In (18a) the postverbal bare NP *mǎ* can have both readings because there are generally no semantic restrictions imposed on objects. Thus when *mǎ* is interpreted as generic, we understand that it is Zhangsan who is tired, not horses in general. If, on the other hand, *mǎ* has the referential reading, then we must infer that the horse is tired. However, when the same NP appears before the verb, it must be marked with *bǎ*. As is argued in Liu (1993), *bǎ*-marked NPs are required to be specific and therefore the preverbal *mǎ* in (18b) does not allow a generic reading. Hence the sentence is no longer ambiguous and we can only have the reading that it is the horse that is tired. This analysis can be confirmed if we change the bare NP in (18) into an NP with a demonstrative such as *nèi-pǐ* 'that (horse)'. The function of the demonstrative is to force the referential reading and eliminate the generic reading. As expected, with a demonstrative, the sentence is no longer ambiguous. This is shown in the following.

(19) a. Zhāngsān qílèi-le nèi-pǐ mǎ.
Zhangsan ride-tired-PER that-CL horse
'Zhangsan rode on that horse and got it tired.'

b. Zhāngsān bǎ nèi-pǐ mǎ qílèi-le
Zhangsan BA that-CL horse ride-tired-PER
'Zhangsan rode on that horse and got it tired.'

A transitive verb in Chinese is defined in this thesis as a verb that must take a postverbal NP/LP object. A typical lexical entry in (20) shows the syntactic descriptions of a transitive verb.

[2] Huang (1984) argues that this difference is between definiteness and indefiniteness while in Liu (1993) the distinction is said to be specificity. The generic/indefinite/non-specific reading of a bare NP can be seen in the following sentence.

(i) Mǎ shǔ yǒuyòng de dòngwu.
horse is have-use DE animal
'Horses are useful animals.'

(20) the category of a transitive verb in Chinese

$$\begin{bmatrix} \text{HEAD } \textit{verb-tr} \\ \text{SUBJ } \langle \boxed{1} \rangle \\ \text{MCOMPS } \langle \boxed{2}, \ldots, \boxed{n\text{-}1} \rangle \\ \text{OBJ } \langle \boxed{n} \rangle \\ \text{SUBCAT } \langle \boxed{1}\text{ARG}_1, \ldots, \boxed{n}\text{ARG}_n \rangle \end{bmatrix}$$

Where $n \geq 2$ and MCOMP = < > if n = 2

A very important aspect of the transitive verb is its obligatory selection of an NP or LP as its object. To make sure this is guaranteed, it must be stated that the argument list for a transitive verb must be equal or greater than two.

The advantage of this treatment of a transitive verb is manifold. Recall that I have argued in the previous chapters that a verb in Chinese provides an ordered list of arguments referred to as the argument structure. These arguments are mapped into the linear order of a sentence structure and the phrase structure requirements of the verb will determine where each argument will appear in a sentence. If the verb is transitive, then the most-patient like argument will be the (postverbal) object and the most-agent-like argument will be the subject. If the argument list is greater than two, the rest of the arguments will be realized as marked complements that appear before the verb. The transitive structure in (20) now can explain this phenomenon.

Previously I have argued that there are two kinds of transitive verbs, nominal and locative. I have already described the structure of other transitive verbs in Chapter 5. Note that the only difference between the two kinds of transitive verbs is that a locative verb must select an LP as the object while for an nominal transitive, the OBJ value must be an NP. The nominal transitive verb can be illustrated with the verb *zhào* 'take (photographs)' in the following.

(21) A fully specified structure description for the nominal transitive verb *zhào* 'take (photographs)' with four arguments

$$\begin{bmatrix} \text{PHON } \langle \text{zhào} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-nom} \\ \text{SUBJ } \boxed{1} \\ \text{MCOMP } \langle \boxed{2}[\text{MARKING yòng}], \boxed{3}[\text{MARKING zài}] \rangle \\ \text{OBJ } \boxed{4} \\ \text{SUBCAT } \langle \boxed{1}\text{NP}_{[5]}, \boxed{2}\text{NP}_{[6]}, \boxed{3}\text{NP/LP}_{[7]}, \boxed{4}\text{NP}_{[8]} \rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{take} \\ \text{TAKER} \quad \boxed{5} \\ \text{TAKEN} \quad \boxed{8} \\ \text{INSTRUMENT } \boxed{6} \\ \text{LOCATION} \quad \boxed{7} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The following are instantiations of the lexical entry in (21).

(22) a. Lǐsī kěyi yòng zhàoxiàngjī zài tiānshān-(shàng) zhào zhàopian.
Lisi can YONG camera ZAI sky-mountain-(top) take photograph
'Lisi can take pictures with a camera on Tianshan mountains.'

b. *Lǐsī kěyi yòng zhàoxiàngjī zài tiānshān-(shàng) bǎ zhàopian zhào.
Lisi can YONG camera ZAI sky-mountain-(top) BA photograph take

In (22), the verb ***zhào*** 'take (pictures)' has four arguments with ***zhàopian*** 'photograph' as the most patient-like and Lisi as the most agent-like and the rest become the marked complements.[3] Note that the object position must be filled with an NP, as is required by the transitivity of the verb. Object fronting with ***bǎ*** does not help save the sentence in (22b).

The possibility of valence change can reduce the SUBCAT list of the verb. However, since ***zhào*** is a transitive verb, there must be an object NP after it no matter how many arguments it has. If we reduce the SUBCAT list to three, then we have the following sentences, depending on which argument is taken off the list.

[3] Again, the order of instrument argument and location argument is not entirely fixed, so far as the proto-agent properties are concerned. Therefore, the following are also possible, besides the sentences given in the main text.

(i) a. Lǐsī kěyi zài tiānshān-(shàng) yòng zhàoxiàngjī zhào zhàopian.
Lisi can ZAI sky-mountain-(top) YONG camera take photograph
'Lisi can take pictures with a camera on Tianshan mountains.'

b. Tiānshān-shàng kěyi yòng zhàoxiàngjī zhào zhàopian.
sky-mountain-(top) can YONG camera take photograph
'Pictures can be taken with a camera on the Tianshan mountains.'

(23) a. Zhàoxiàngjī kěyi zài tiānshān-(shàng) zhào zhàopian.
camera can ZAI sky-mountain-(top) take photograph
'Pictures can be taken with a camera on the Tianshan mountains.'

b. Lǐsǐ kěyi zài tiānshān-(shàng) zhào zhàopian.
Lisi can ZAI sky-mountain-(top) take photograph
'Lisi can take pictures on Tianshan mountains.'

c. Lǐsǐ kěyi yòng zhàoxiàngjī zhào zhàopian.
Lisi can YONG camera take photograph
'Lisi can take pictures with a camera.'

d. Lǐsǐ kěyi yòng zhàoxiàngjī zhào tiānshān(*-shàng).
Lisi can YONG camera take sky-mountain(*-top)
'Lisi can take pictures of the Tianshan mountains with a camera.'

e. *Lǐsǐ kěyi yòng zhàoxiàngjī zài tiānshān-(shàng) zhào.
Lisi can YONG camera ZAI sky-mountain-(top) take

In (23a) when Lisi is missing, the next most agent-like argument *zhàoxiàngji* 'camera' becomes the subject. In (23d), when the most patient-like argument *zhàopian* is missing, *tiānshān* 'the Tianshan mountains' becomes the object. Please note that the phrase structure requires the object to be an NP, therefore the LP *tiānshān-shàng* 'on the Tianshan mountains', although possible as a marked complement, can not be the object. Since the verb *zhào* is transitive, it has to take an object. Failure to do so results in the unacceptability of the sentence, as is shown in (23e).

If the number of arguments is reduced by two, then we have the following array of sentences, bearing in mind that the argument hierarchy is still in place and only the marked complements are optional.

(24) a. Zhàoxiàngjī kěyi zhào zhàopian.
camera can take photograph
'A camera can (be used to) take pictures.'

b. Zhàoxiàngjī kěyi zhào tiānshān(*-shàng).
camera can take sky-mountain(*-top)
'A camera can (be used to) take (pictures of) Tianshan mountains.'

c. Lǐsǐ kěyi zhào zhàoxiàngji.
Lisi can take camera
'Lisi can take pictures with a camera.'

d. Lǐsǐ kěyi zhào tiānshān(*-shàng)
Lisi can take sky-mountain(*-top)
'Lisi can take pictures of the Tianshan mountains.'

e. Lǐsǐ kěyi zhào zhàopian.
Lisi can take photograph
'Lisi can take pictures.'

f. Tiānshān-(shàng) kěyi zhào zhàopian.
sky-mountain-(top) can take photograph
'Pictures can be taken on Tianshan mountains.'

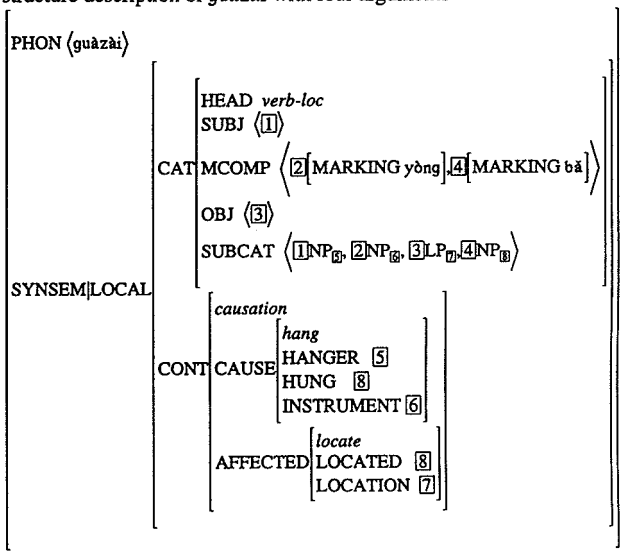
g. *Lǐsǐ kěyi yòng zhàoxiàngji zhào.
Lisi can YONG camera take

h. *Lǐsǐ kěyi zài tiānshān-(shàng) zhào.
Lisi can ZAI sky-mountain-(top) take

i. *Zhàoxiàngjī kěyi zài tiānshān-(shàng) zhào.
camera can ZAI sky-mountain-(top) take

A locative transitive verb *guàzài* 'hang on' requires that its object position be filled with an LP, not an NP, as is illustrated by the following structure.

(25) the structure description of *guàzài* with four arguments



The argument hierarchy shows that there is only one LP in the valence of the verb and it is not the most patient-like argument. However, it is the requirement of the verb that the object position be filled with an LP and any other choice will results in unacceptibility of the sentence. Note also that *guàzài* is a transitive verb and the object position must be filled or the sentence is not acceptable. Thus the specific requirement of the verb forces the LP to be the object. The following examples show that this description is correct.

(26) a. Lǐsǐ kěyi yòng dìngzi bǎ huà guàzài qiáng-shàng.
Lisi can YONG nail BA painting hung-at wall-top
'Lisi can hung the painting on the wall with nails.'

b. *Lǐsǐ kěyi yòng dìngzi zài qiáng-shàng guàzài huà.
Lisi can YONG nail ZAI wall-top hung-at painting

c. *Lǐsǐ kěyi yòng dīngzi zài qiáng-shàng bǎ huà guàzài.
Lisi can YONG nail ZAI wall-top BA painting hung-at

And again, the valence change can reduce the number of arguments to three and two. But the LP has to remain on the argument list and it has to occupy the postverbal object position in all cases. The following examples show this.

(27) a. Dīngzi kěyi bǎ huà guàzài qiáng-shàng.
nail can BA painting hung-at wall-top
'Nails can (be used to) hung the painting on the wall.'

b. Lǐsǐ kěyi bǎ huà guàzài qiáng-shàng.
Lisi can BA painting hung-at wall-top
'Lisi can hung the painting on the wall.'

c. *Dīngzi kěyi zài qiáng-shàng guàzài huà.
nail can ZAI wall-top hung-at painting

d. *Lǐsǐ kěyi zài qiáng-shàng guàzài huà.
Lisi can ZAI wall-top hung-at painting

(28) a. Huà kěyi guàzài qiáng-shàng.
painting can hung-at wall-top
'The painting can be hung on the wall.'

b. *Qiáng-shàng kěyi guàzài huà.
wall-top can hung-at painting

c. *Huà kěyi zài qiáng-shàng guàzài.
painting can ZAI wall-top hung-at

d. *Qiáng-shàng kěyi bǎ huà guàzài.
wall-top can BA painting hung-at

As can be seen in the above examples, the most patient-like argument also has to remain on the argument list no matter how the list is reduced. This is due to the unaccusativity of the verb, which will be further discussed in the next few sections.

6.1.2 Intransitives (Verbs That Do Not Take NP/LP Objects)

Having identified the transitive verbs as ones that take unmarked complements, now the intransitive verbs in Chinese are defined as the ones that do not take unmarked complements. A typical intransitive verb is as follows.

(29) the category of an intransitive verb in Chinese

$$\begin{bmatrix} \text{HEAD } \textit{verb-intr} \\ \text{SUBJ } \langle \boxed{1} \rangle \\ \text{MCOMP } \langle \boxed{2}, \ldots, \boxed{n} \rangle \\ \text{OBJ } \langle\,\rangle \\ \text{SUBCAT } \langle \boxed{1}\text{ARG}_1, \ldots, \boxed{n}\text{ARG}_n \rangle \end{bmatrix}$$

Where $n \geq 1$ and MCOMPS = < > if $n = 1$

As we can see from the entry in (29), the major difference here is that the OBJ value of an instransitive verb is the empty list. This means that the verb does not take any postverbal object. However, it does not mean that there will be no theme argument or most patient-like argument in the sentence. It just means that all the arguments, except for the most agent-like one that will fill the subject position, now become marked complements and occupy the preverbal positions. Take ***xuéxi*** 'study' for example. The intransitive version of the verb now can have the following structure.

(30) the structure of the intransitive verb ***xuéxi*** with three arguments

$$\begin{bmatrix} \text{PHON } \langle \text{xuéxi} \rangle \\ \text{SYNSEM|LOCAL|CAT} \begin{bmatrix} \text{HEAD } \textit{verb-intr} \\ \text{SUBJ } \langle \boxed{1} \rangle \\ \text{MCOMP } \langle \boxed{2}, \boxed{3} \rangle \\ \text{OBJ } \langle\,\rangle \\ \text{SUBCAT } \langle \boxed{1}\text{NP}, \boxed{2}\text{NP /LP}, \boxed{3}\text{NP} \rangle \end{bmatrix} \end{bmatrix}$$

An instantiation of (30) is shown as (31) below.

(31) Zhāngsan zài gōngchǎng(-lǐ) xiàng gōngren xuéxi.
Zhangsan ZAI factory-inside XIANG worker study
'Zhangsan learns from workers in the factory.'

Depending on their syntactic properties, intransitive verbs can be further classified as ergative or unergative. We will discuss each in separate subsections below.

6.1.2.1 Unergative Verbs

Ergativity is a term used to describe grammatical constructions where there is a formal parallel between the subject of an intransitive verb and the object of a transitive one (Lyons 1968, Palmer 1984). For instance, in the following sentence, the object of transitive verb *broke* in (32a) and the subject of the intransitive verb *broke* in (32b) share the same thematic role.

(32) a. The man broke the window.
b. The window broke.

The term unergativity is used here to describe grammatical constructions that lack such parallelism. That is, the subject of an intransitive verb does not identify itself with the object of a transitive verb. Instead, it must be the same as the subject of the transitive verb. The following sentences display this phenomenon.

(33) a. The boy reads the paper.

b. The boy reads.

c. *The paper reads.

(34) a. Lǐsì xuéxi wénjiàn.
Lisi study document
'Lisi studies the documents.'

b. Lǐsì xuéxi.
Lisi study
'Lisi studies.'

c. *Wénjiàn xuéxi.
document study

Thus unergativity entails the obligatoriness of the most agent-like argument, which must serve as the subject of the sentence. Therefore *xuéxi* in (34b) is not just an intransitive verb but an unergative intransitive verb. A typical structure of an unergative intansitive verb is shown in (35).

(35) the category of an unergative intransitive verb with one or two arguments

$$\begin{bmatrix} \text{CAT} & \begin{bmatrix} \text{HEAD} & \textit{verb-unerg} \\ \text{SUBJ} & \langle \boxed{1} \rangle \\ \text{MCOMP} & \langle (\boxed{2}) \rangle \\ \text{SUBCAT} & \langle \boxed{1}\text{NP}_{\boxed{a}}, (\boxed{2}\text{NP}/\text{LP}_{\boxed{a}}) \rangle \end{bmatrix} \\ \text{CONT} & \begin{bmatrix} \textit{relation} & \\ \text{V-ER} & \boxed{4} \\ \text{V-RELATED} & \boxed{5} \end{bmatrix} \end{bmatrix}$$

The following are some instantiations of (35).

(36) a. Lǐsì zài fànguǎn(-lǐ) chībǎo-le.
Lisi ZAI restaurant(-inside) eat-full-PER
'Lisi is full after eating in a restaurant.'

b. Lǐsì chībǎo-le.
Lisi eat-full-PER
'Lisi is full after eating.'

c. *Fànguǎn(-lǐ) chībǎo-le.
restaurant(-inside) eat-full-PER

(37) a. Wǒ xiàng Léi Fēng xuéxi.
we XIANG Lei Feng learn
'We learn from Lei Feng.'

b. Wǒ xuéxi.
we learn
'We learn.'

c. *Léi Fēng xuéxi.
Lei Feng learn
Intended: '(Someone) learns from Lei Feng.'

(38) a. Zhāngsān dào Měiguó lái-le.
Zhangsan DAO US come-PER
'Zhangsan has come to the United States.'

b. Zhāngsān lái-le.
Zhangsan come-PER
'Zhangsan has come.'

c. *Měiguó lái-le.
US come-PER

Some unergative verbs may have transitive counterparts.. The transitivization of an unergative verb is characterized by adding a more patient-like argument to the SUBCAT list if the SUBCAT list of the unergative verb is a singleton set. And the most patient-like argument will be selected as the object.

An unergative intransitive verb does not take complements marked by *bǎ*. An intransitive verb that takes an *bǎ* complement can be classified as a middle verb, as explained below. Examine the following.

(39) a. Zhāngsān bǎ tuǐ shuāiduàn-le.
Zhangsan BA leg fall-break-PER
'Zhangsan broke his leg after falling down.'

b. Tuǐ shuāiduàn-le.
leg fall-break-PER
'(Someone) broke his leg after falling down.'

c *Zhāngsān shuāiduàn-le.
Zhangsan fall-break-PER

Cf. the transitive version of the verb:

d. Zhāngsān shuāiduàn-le tuǐ.
Zhangsan fall-break-PER leg
'Zhangsan fell and broke his leg.'

6.1.2.2 Ergative Verbs and Middle Verbs

An ergative verb is generally considered to be an unaccusative verb whose internal argument (in the sense of Williams 1981) takes subject position.[4] In the literature, linguists have proposed various syntactic diagnostics for unaccusative verbs in various languages (for Japanese see Miyagawa 1988, 1989; for German see Perlmutter 1978, for Italian see Burzio 1986). Most of the findings, however, are to show that the argument that the putative unaccusative verb has must be an internal one. Thus the intransitive version of the English verb *roll* is said to be an ergative/unaccusative verb. Consider the following.

[4] According to some syntactic theories like Government and Binding and its later developments (Perlmutter 1978, Burzio 1986, Grimshaw 1987), an unaccusative verb has an internal argument but no accusative Case to asign. Thus the internal argument has to move to the subject position to get Case or the structure is in violation of the Case Theory

(40) a. The ball rolled down the hill.

Cf. b. John rolled the ball down the hill.

In (40b), we see that the ***ball*** serves as the object. This is because it is the internal argument of the verb. In (40a), when the agent argument is dropped, the internal argument becomes the suject. In Chinese, there are verbs that also display the same ergative properties.

(41) a. Qiánbāo diū-le.
money-bag lost-PER
'The wallet has dissapeared.'

Cf. b. Zhāngsān diū-le qiánbāo
Zhangsan lost-PER money-bag
'Zhangsan has lost (his) walllet.'

In (41b) we see that ***qiánbāo*** 'the wallet' functions as the unmarked complement because it is the internal argument of the verb *diū-le* 'have disappeared'. In (41a) the same argument becomes the subject when the verb is used intransitively with the EXPERIENCER argument absent. Thus *diū-le* in (41a) qualifies as an ergative verb.

In the literature, *bǎ*-marked complements have been argued to have all the properties an internal argument must have. For instance, Travis (1984) has argued that the preverbal *bǎ*-marked argument bears the same theta role as the postverbal object. The only difference between the two positions, according to her, is how the argument can get Case. Tai (1973) also assumes the *bǎ*-phrase to be an object and hence the internal argument.

Under the current analysis, the *bǎ*-phrase is treated as a complement, which is generally regarded as a VP-internal argument. Yet it is not in the object position because the verb is either an intransitive and cannot have an object or the object position is otherwise occupied.[5] Thus, it is in the sense of an NP being an internal argument but not in the object

[5] This is the case when the sentence contains a locative transitive verb, as is shown in the following.

(i) Zhāngsān bǎ qián zhuāngzài kǒudài-lǐ.
Zhangsan BA money put-in-at pocket-inside
'Zhangsan puts the money in the pocket.'

(i) is like (42) in that the most agent-like argument, not the most patient-like arguemnt, can be suppressed so that the *bǎ*-NP can be in the subject position. Examine the following.

(ii) Qián zhuāngzài kǒudài-lǐ.
money put-in-at pocket-inside
'(Someone) puts the money in the pocket.'

(i) *Zhāngsān zhuāngzài kǒudài-lǐ.
Zhangsan put-in-at pocket-inside
Intended: 'Zhangsan put (something) in pocket.'

position that *bǎ*-construction can be considered to pattern as an ergative strucutre.[6] This is illustrated with the following examples.

(42) a. Fànrén fàngpǎo-le.
crimnal let-go-run-PER
'The criminal was let run away.'

b. Kànshǒu fàngpǎo-le fànrén.
jailer let-go-run-PER criminal
'The jailer has let the criminal run away.'

c Kànshǒu bǎ fànrén fàngpǎo-le.
jailer BA criminal let-go-run-PER
'The jailer has let the criminal run away.'

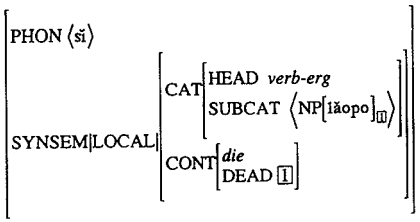
d. *Kànshǒu fàngpǎo-le.
jailer run-PER
Intended: 'The jailer has let (someone) run away on .'

In (42a), the verb ***fàngpǎo-le*** has only one argument, ***fànrén*** 'the criminal', and it takes the subject position. However, we know it is an internal argument because it bears the patient/theme role. Its internal argument status is confirmed when it takes the object position in a transitive version of the same verb in (42b) where an agent argument *kànshǒu* 'the jailer' is added to the SUBCAT list. (42c) is just like (42b) except that the verb ***fàngpǎo-le*** is still intransitive. Thus the agent argument *kànshǒu* 'the jailer' takes the subject position and the internal argument ***fànren*** 'the criminal' becomes the *bǎ*- marked complement. Therefore, we see that the verb ***fàngpǎo-le*** behaves just like the ergative verb *diū-le* in (41). The difference between (42a) and (42c) seems to be that (42a) is a single-argument ergative-like construction and (42c) is a two-argument ergative-like construction.

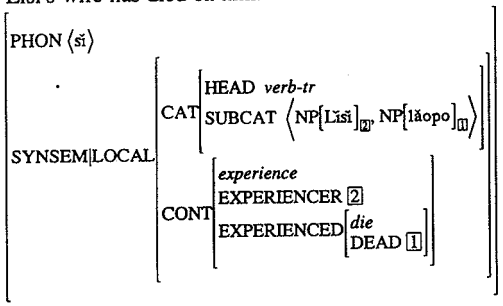
We can compare (41) and (42) from a different angle. In a possible HPSG analysis of (41) (Carl Pollard, personal communication), the verb *diū-le* in (41b) is treated as a transitivized version of the ergative verb in (41a). Thus, the process of transitivizing an ergative verb is to add a more agent-like argument to the SUBCAT list of the ergative verb. Consider the following.

(43) a. Lǎopo sǐ-le.
wife die-PER
'The wife has died.'

[6] Robert Levine (personal communication) comments that *bǎ*-construction is like an antipassive. However, it is also different from an antipassive structure in that it can still undergo (standard) passivization.

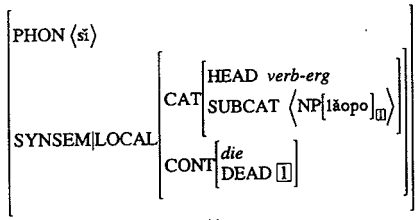


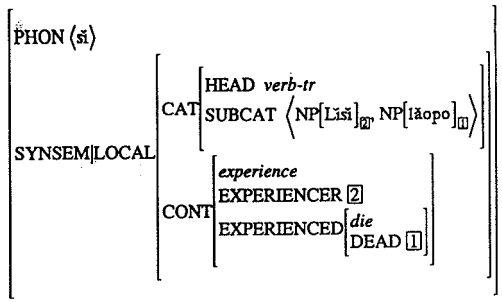
b. Lǐsǐ sǐ-le lǎopo.
Lisi die-PER wife
'Lisi's wife has died on him.'



In (43a), the verb *sǐ* 'die' is an ergative intransitive verb. When it is transitivized, an experiencer argument is added to the SUBCAT list and thus we have (43b). The following instance of lexical rule application shows the transitivization of the ergative verb *sǐ*.

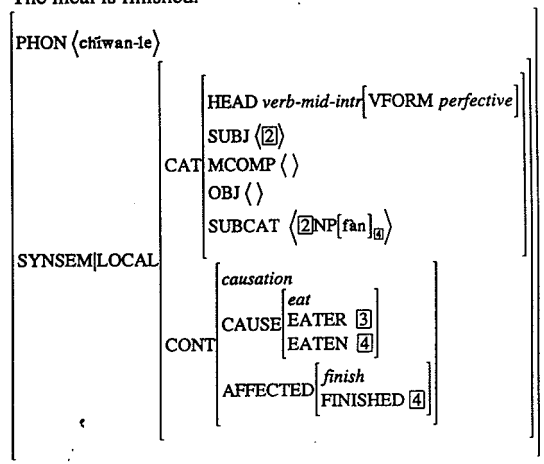
(43) c.



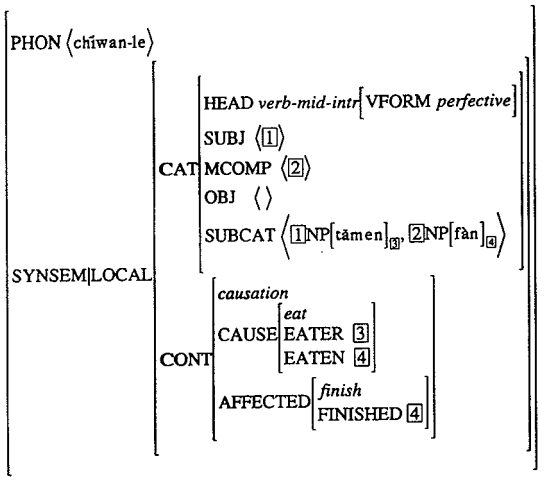


It is the properties of transitivizability and addibility of a more agent-like argument that the *bǎ*-structure shares with the ergative structure. However, the *bǎ*-construction is also different from the ergative structure in the following respects. First, transitivization of an ergative and addition of a more agent-like argument are a one-step lexical operation, whereas, for a *bǎ*-construction, the operation is divided into two separate steps: addition of an agent argument and transitivization of the verb. Examine the following.

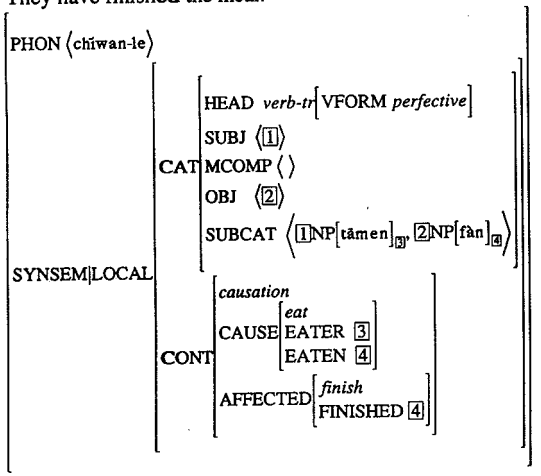
(44) a. Fàn chīwán-le.
meal eat-finish-PER
'The meal is finished.



b. Tāmen bǎ fàn chīwán-le.
they BA meal eat-finish-PER
'They have finished the meal.'



c. Tāmen chīwán-le fàn.
they eat-finish-PER meal
'They have finished the meal.'



We can see in (44) that when an agent argument is added to the SUBCAT list of (44a), we have a *bǎ*-construction in (44b). By the definition of transitivity used in this thesis, (44b) is an intransitive verb because its OBJ value is the empty list. When the verb is transitivized,

the internal argument *fàn* 'meal' takes the object position because it is the most patient-like argument and we have (44c), thus completing the transitivization in two steps.

The second difference between the ergative and *bǎ*-construction is that when an ergative is transitivized, the predication of the verb has changed. For instance, the verb in (43b) has two thematic roles but the verb in (43a) has only one. Thus when we say that the subject is added in (43b), we not only mean that the SUBCAT list is increased by one, but also that the most agent-like role is added to the CONTENT value. However, when we add a more agent-like argument to the SUBCAT list in (44), we do not change the CONTENT value of the verb, as can be seen in all the three lexical entries of the verb *chīwán-le* in (44). This is because the agent role is always there with the verb and only in (44a) this agent argument is not lexically realized. It is because of these differences that I want to distinguish (44) from the putative ergative structure in (43) and call it a middle structure. The verb in (44a) is classified as a middle verb.[7]

The second difference between ergative structures and middle structures also argues against an argument addition analysis of middle verbs: the argument is already semantically present and it is just not lexically realized. Therefore I propose that the head verb of (44b) is the basic lexeme and that of (44a) is formed through a lexical rule that suppresses the agent argument. Thus for a middle verb, we propose the following lexical rule to suppress the agent argument.

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[7] Carl Pollard observes that middle verbs without a *bǎ*-phrase, but not ergative verbs, can be thought of as passives without mophological change. Compare (43a) and (44a) with the following:

(i) Fàn bèi-chīwán-le.
meal BEI-eat-finish-PER
'The meal is finished (by someone).'

(ii) *Lǎopo bèi-sǐ-le.
wife BEI-die-PER

However, in some cases, the bǎ-less middles are actually ambiguous, and only one of the readings has the same interpretation as the passive. Consider the following.

(iii) Zhāngsān dǎshāng-le.
Zhangsan hit-wounded-PER
a. 'Zhangsan got himself wounded while hitting someone.'
b. 'Zhangsan was hit and wounded.'

(iv) Zhāngsān bei-dǎshāng-le.
Zhangsan BEI-hit-wounded-PER
'Zhangsan was hit and wounded.'

As we can see, the passive version of (iv) is only equivalent to the (b) reading in (iii), not the (a) reading. The structure of middles is discussed in detail in later sections.

(44) d. Agent Argument Suppression Rule

$$\begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-mid} \\ \text{SUBCAT } \langle \boxed{2}\text{NP}_{\boxed{4}}, \boxed{3}\text{NP}_{\boxed{5}} \rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{relation} \\ \text{ROLE } \boxed{4} \\ \text{ROLE } \boxed{5} \end{bmatrix} \end{bmatrix}$$

$$\Downarrow$$

$$\begin{bmatrix} \text{CAT} \begin{bmatrix} \text{SUBCAT } \langle \boxed{3}\text{NP}_{\boxed{5}} \rangle \end{bmatrix} \end{bmatrix}$$

The relationship between the head verbs of (44c) and (44b) will be treated in terms of intransitive middle verb transitivization rule, to be discussed in the next section. When I say an intransitive middle verb, I imply that there are middle verbs that already have unmarked complements. Examine the following.

(45) a. Zhāngsān bǎ júzi fàngzài-le lánzi-lǐ.
Zhangsan BA orange put-at-PER basket-inside
'Zhangsan has put the oranges in the basket.'

b. Júzi fàngzài-le lánzi-lǐ.
orange put-at-PER basket-inside
'The oranges was put in the basket.'

I will show later that transitive middle verbs do not undergo transitivization, since they are already transitives. However, they still qualify as middle verbs because they can undergo agent argument suppression, as has been shown in (45b), where the agent argument was absent from the SUBCAT list (cf. (45a).

6.1.3. Alternation

I have argued that in Chinese valence alternation is due to different argument structure requirements. Thus, if a verb has a valence of two, the argument structure of that verb will depend on its transitivity. If it is an transitive verb, then we have a sentence with a subject and an object. If the verb is an intransitive one, then we have a sentence with a subject and a marked complement. If the valence of the verb is to be reduced to one, then the form of the resulting sentences will depend on whether it is middle, unergative, or ergative. Examine the following.

(46) a. Lǐsǐ kāizǒu-le nèi-bu qìchē
Lisi drive-away-PER that-CL car
'Lisi has driven the car away.'

b. the lexical entry for the transitive verb *kāizǒu-le*

$$\begin{bmatrix} \text{PHON } \langle \text{kāizǒule} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-tr} \begin{bmatrix} \text{VFORM } \textit{perfective} \end{bmatrix} \\ \text{SUBCAT } \left\langle \text{NP}\begin{bmatrix}\text{Lǐsǐ}\end{bmatrix}_{\boxed{1}}, \text{NP}\begin{bmatrix}\text{nèi-bu qìchē}\end{bmatrix}_{\boxed{2}} \right\rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{causation} \\ \text{CAUSE} \begin{bmatrix} \textit{drive} \\ \text{DRIVER } \boxed{1} \\ \text{DRIVEN } \boxed{2} \end{bmatrix} \\ \text{AFFECTED} \begin{bmatrix} \textit{away} \\ \text{AWAY } \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

The lexical entry of *kāizǒu-le* in (46b) requires the presence of an object in the form of an NP. Therefore, we understand that (46a) is projected from a transitive verb. A different sentence, (46c), also involves the verb *kāizǒule*. But the verb is now used intransitively and does not take any object. The two arguments are arranged as the subject and *bǎ*-marked complement and the sentence is projected from an intransitive verb given as (46d).

(46) c. Lǐsǐ bǎ nèi-bu qìchē kāizǒu-le
Lisi BA that-CL car drive-away-PER
'Lisi has driven the car away.'

d. the lexical entry for the intransitive verb *kāizǒu-le*

$$\begin{bmatrix} \text{PHON } \langle \text{kāizǒule} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-mid-intr} \begin{bmatrix} \text{VFORM } \textit{perfective} \end{bmatrix} \\ \text{SUBCAT } \left\langle \text{NP}\begin{bmatrix}\text{Lǐsǐ}\end{bmatrix}_{\boxed{1}}, \text{NP}\begin{bmatrix}\text{nèi-bu qìchē}\end{bmatrix}_{\boxed{2}} \right\rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{causation} \\ \text{CAUSE} \begin{bmatrix} \textit{drive} \\ \text{DRIVER } \boxed{1} \\ \text{DRIVEN } \boxed{2} \end{bmatrix} \\ \text{AFFECTED} \begin{bmatrix} \textit{away} \\ \text{AWAY } \boxed{2} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

As we can see from these two lexical entries, they are very similar except for the realization of the second argument. This similarity can be captured by the following lexical rule.

(46) e. Transitivization Rule for Intransitive Middle Verbs

$$\left[\begin{array}{l}\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-mid-intr}\\ \text{SUBCAT } \langle \text{NP}_{[1]}, \text{NP}_{[2]} \rangle\end{array}\right]\\ \text{CONT}\left[\begin{array}{l}\textit{relation}\\ \text{ROLE } [1]\\ \text{ROLE } [2]\end{array}\right]\end{array}\right] \Rightarrow \left[\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-tr}\\ \text{SUBCAT } \langle \text{NP}_{[1]}, \text{NP}_{[2]} \rangle\end{array}\right]\right]$$

An ergative verb is also an intransitive verb. It can be transitivized by adding an more agent-like argument to the SUBCAT list. This is shown in the following.

(47) a. Yī-ge rén lái-le.
one-CL person come-PER
'A person has come.'

b. Jiā-lǐ lái-le yī-ge rén
home-inside come-PER one-CL person
'To (our) home has come a person.'

c. the transitivization lexical rule for ergative verbs

$$\left[\begin{array}{l}\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-erg}\\ \text{SUBCAT } \langle \text{NP}_{[1]} \rangle\end{array}\right]\\ \text{CONT}\left[\begin{array}{l}\textit{relation}\\ \text{ROLE } [1]\end{array}\right]\end{array}\right] \Rightarrow \left[\begin{array}{l}\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-tr}\\ \text{SUBCAT } \langle \text{NP/LP}_{[3]}, \text{NP}_{[1]} \rangle\end{array}\right]\\ \text{CONT}\left[\begin{array}{l}\textit{experience}\\ \text{EXPERIENCE } [3]\\ \text{EXPERIENCED}\left[\begin{array}{l}\textit{relation}\\ \text{ROLE } [1]\end{array}\right]\end{array}\right]\end{array}\right]$$

If, on the other hand, the verb does not show the properties of ergativity, the preverbal complement will be marked by other markers. Therefore the following lexical entries and rule are employed.

(48) the trnasitivization lexical rule for unergative verbs

$$\left[\begin{array}{l}\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-unerg}\\ \text{SUBCAT } \langle \text{NP}_{[1]}, \text{NP}_{[2]} \rangle\end{array}\right]\\ \text{CONT}\left[\begin{array}{l}\textit{relation}\\ \text{ROLE } [1]\\ \text{ROLE } [2]\end{array}\right]\end{array}\right] \Rightarrow \left[\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-tr}\\ \text{SUBCAT } \langle \text{NP}_{[1]}, \text{NP}_{[2]} \rangle\end{array}\right]\right]$$

Two instantiations of (48) are given as (49) and (50), where the unergative verbs are illustrated by *qù-le* 'have gone (to)' and *zhù-guo* 'lodged' respectively.

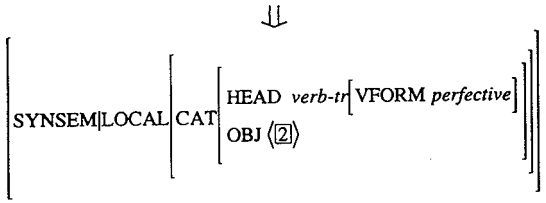
(49) a. Zhāngsān qù-le Běijīng.
Zhangsan go-PER Beijing
'Zhangsan has gone to Beijing.'

b. Zhāngsān dào Běijīng qù-le.
Zhangsan DAO Beijing come-PER
'Zhangsan has gone to Beijing.'

Compare: c. Zhāngsān qù-le.
Zhangsan go-PER
'Zhangsan has gone (to some place).'

d. *Běijīng qù-le.
Běijīng go-PER
Intended: '(Someone) has gone to Beijing.'

$$\left[\begin{array}{l}\text{PHON } \langle \text{qù-le} \rangle\\ \text{SYNSEM|LOCAL}\left[\begin{array}{l}\text{CAT}\left[\begin{array}{l}\text{HEAD } \textit{verb-unerg}\left[\text{VFORM } \textit{perfective}\right]\\ \text{SUBJ } \langle [1] \rangle\\ \text{MCOMP } \left\langle [2]\left[\text{MARKING dào}\right] \right\rangle\\ \text{OBJ } \langle\,\rangle\\ \text{SUBCAT } \left\langle [1]\text{NP}\left[\text{PHON}\langle \text{Zhāngsān} \rangle\right]_{[3]}, [2]\text{NP}\left[\text{PHON } \langle \text{Běijīng} \rangle\right]_{[4]} \right\rangle\end{array}\right]\\ \text{CONT}\left[\begin{array}{l}\textit{go}\\ \text{GOER } [3]\\ \text{DESTINATION } [4]\end{array}\right]\end{array}\right]\end{array}\right]$$

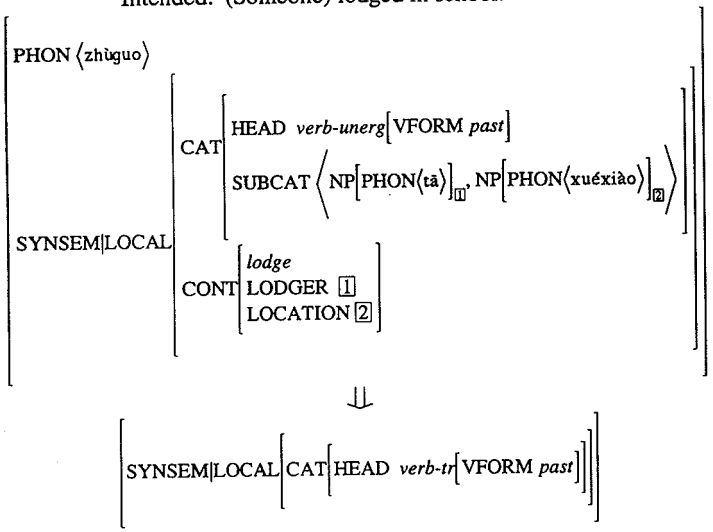


(50) a. Tā zhù-guo xuéxiào.
he lodge-PAST school
'He lodged in school.'

b. Tā zài xuéxiào zhù-guo.
he ZAI school lodge-PAST
'He lodged in school.'

Compare: c. Tā zhù-guo.
he lodge-PAST
'He lodged (in some place).'

d. *Xuéxiào zhù-guo.
school lodge-PAST
Intended: '(Someone) lodged in school.'



6.2. Restrictions

In the preceding section, I have shown that the different structures mentioned at the beginning of this chapter as (5) are the results of the alternation of the verb *chī-le* 'have eaten' between a transitive and an intransitive use. Although the valence alternations can be captured by the lexical rules discussed above, it should also be noted that there are cases

where there are no alternations available. To prevent the the lexical rules from overapplying, restrictions on the input structures need to be discussed.

6.2.1 Non-Alternation

I have shown that with an intransitive middle verb, a *bǎ*-phrase can always alternate with the transitive use of the verb. However, other verbs do not allow the *bǎ*-phrase alternation. Some verbs even do not allow any alternation at all. Here are some examples.

(51) a. Zhāngsān hēzuǐ-le jiǔ.
Zhangsan drink-drunk-PER wine
'Zhangsan is drunk (after drinking wine).'

b. *Zhāngsān bǎ jiǔ hēzuǐ-le.
Zhangsan BA wine drink-drunk-PER

(52) a. Zhāngsān bǎ yǐzi shuàiduàn-le tuǐ.
Zhangsan BA chair throw-break-PER leg
'Zhangsan has broken the chair's legs (after throwing it).'

b. *Zhāngsān bǎ yǐzi bǎ tuǐ shuāiduàn-le.
Zhangsan BA chair BA leg throw-break-PER

(53) a. Zhāngsān bǎ xíngli fàngzài-le chē-shàng.
Zhangsan BA luggage place-at-PER bus-top
'Zhangsan has put the luggage on the bus.'

b. *Zhāngsān fàngzài-le xíngli chē-shàng.
Zhangsan place-at-PER luggage bus-top

In order to prevent our lexical rules from overgenerating, we need to have some restrictions on the application of the rules. However, in order to state the correct constraints, we must understand how and why the arguments in these verbs behave the way they do. What is common to these examples is that all the verbs are resultative verbs. Thus we start with the study of how resultative verbs are formed and what determines the argument structure in these verbs.

6.2.2. Resultative Verb Compounds

Previous analyses of RVCs are mostly focused on the argument structures of the compounded verbs. Two different syntactic approaches are worthy of commenting on here. In Hashimoto (1964), Cheung (1973), and Chang (1989), the RVCs have been treated as belonging to two different clauses, with the first component verb in the matrix clause and the second in the embedded resultative clause. The possibility of having a *bǎ*-phrase alternation is largely dependent on how the arguments of each verb can be matched. Take the following as examples.

(54) a. Zhāngsān hēzuǐ-le jǐu.
Zhangsan drink-drunk-PER wine
'Zhangsan got drunk after drinking wine.'

b. *Zhāngsān bǎ jǐu hēzuǐ-le.
Zhangsan BA wine drink-drunk-PER

(55) a. Zhāngsān hēguāng-le jǐu.
Zhangsan drink-empty-PER wine
'Zhangsan has drunk all the wine.'

b. Zhāngsān bǎ jǐu hēguāng-le.
Zhangsan BA wine drink-empty-PER
'Zhangsan has drunk all the wine (the wine pot is empty).'

It has been argued by Hashimoto in his analysis that only when the the object of the matrix verb matches the subject of the embedded verb is the *bǎ*-phrase alternation possible. In (54) the object of the matrix verb *hē* 'drink' is *jǐu* 'wine', but the subject of the embedded verb *zuǐ* 'get drunk' is *Zhāngsān*. There is no match, hence the unacceptable *bǎ*-construction. In (55), we have the same matrix verb, but a different embedded verb *guāng* 'be empty', the subject of which is *jǐu* 'wine', a match for the object of the matrix verb. Therefore, we have an acceptable *bǎ*-phrase alternation. This analysis assumes that the matrix verb plays the most important role and must be a transitive verb. It is criticized as too weak (Gao 1995) to allow either (56), where the matrix verb is intransitive, or (57) where the embedded subject is a distinct lexical item that does not match the matrix object.

(56) a. Zhāngsān kūshī-le shǒupa.
Zhangsan cry-wet-PER handkerchief
'Zhangsan cried (so much) that the handkerchief got wet.'

b. Zhāngsān bǎ shǒupa kūshī-le.
Zhangsan BA handkerchief cry-wet-PER
'Zhangsan cried (so much) that the handkerchief got wet.

(57) a. Zhāngsān (chī fàn) chīhuài-le dùzi.
Zhangsan eat meal eat-bad-PER stomach
'Zhangsan's stomach is upset (after eating the meal).'

b. Zhāngsān (chī fàn) bǎ dùzi chīhuài-le.
Zhangsan eat meal BA stomach eat-bad-PER
'Zhangsan's stomach is upset (after eating the meal).'

Gao (1995) proposes different deep structures for the two RVCs. The embedded verbs have an anaphoric subject controlled either by the matrix subject or object. It is shown there that only object controlled structures like (55) and (56) allow the *bǎ*-phrase alternation. This is because when the object of the RVC moves to a position between the subject and the RVC in a subject controlled structure like (54), it intervenes and destroys the binding relation between the matrix subject and the anaphoric embedded subject, resulting in unacceptability. Some problems remain. For instance, it is not mentioned there

that how the analysis should handle the sentences in (57) where there is a third argument for a normal transitive verb. But this analysis is the first to shift the focus of the RVC from the first component to the second.

On the lexical front, Chang (1989) proposes that an RVC in Chinese is actually one item made of two stems. The combination of the two stems takes place in the lexicon rather than in the syntax. When the two stems combine to form a new verb, their argument structures also change: some arguments percolating up to the branching node dominating the stems, others being absorbed or even left out. For instance, to expain the difference between ***hēguāng*** 'drink to empty' in (55) and ***hēzuǐ*** 'drink to be drunk' in (54), she proposes that in the stems of ***hēguāng*** 'drink to empty', the two themes are co-indexed hence licensing the ***bǎ***-construction. On the other hand, ***hēzuǐ*** 'drink to be drunk' does not have coindexed themes so the ***bǎ***-construction is not allowed. This seems to be only a restatement of Hashimoto's syntactic analysis within a lexical approach. The same problem remains: why the ***bǎ***-construction is allowed with ***kū-shī*** in (56) which does not have coindexed themes, since, according to her proposal, the first stem *kū* 'cry' has only one agent argument and the second stem only a theme.

A different lexical analysis can be found in Li (1990) and Ross (1990), where the first component verb is argued to be the head of the RVC. Li argues that each of the two component verbs has its own structured theta-grid, notated as <1>, <1,2> or <1,2,3> for the first component verb and <1'>, <1',2'> or <1',2',3'> for the second, depending on the number of theta roles the verb has. When the two verbs combine into a compound, the theta roles will be identified and assigned through the compound as a unit. The theta role identification procedure must obey the Head-Feature Percolation principle. That is, the theta-grid structure of the compound must respect that of the head verb. Thus if we have a (<1,2>,<1'>) combination, as is the case of (54) and (55), the theta-grid of the compound must be either <1-1',2> or <1,2-1'> if the compound only allows two arguments. That is, the theta role of V2 has to be identified with either the first or the second argument of V1. The <1-1',2> compound produces sentences like (54a) while the <1,2-1'> compound produces sentences like (55a). Unfortunately, Li stops short of considering the theta-grid <1,2-1'> to produce (55b). Actually, he does not even consider the *bǎ*-construction until he comes to (<1,2>,<1',2'>) compounds that have three theta roles, where he claims that the structured theta-grid of the compound that allows the *bǎ*-construction is invariably <1,2-1',2'>. Please note the similarity between <1,2-1'> compounds and <1,2-1',2'> compounds. The reason that Li does not consider <1,2-1'> for the *bǎ*-construction is perhaps that his theory does not allow it. Recall that the compounding procedure has to

follow the head-feature percolation principle. In a <1,2-1'> compound, the first verb is transitive and therefore the compound must also be a transitive verb, and the *bǎ*-phrase does not get Case from the verb and therefore may not be considered as an object. If this is the case, then we must find some other way to allow (55b).

Li's analysis is limited also to (<1>,<1'>) compounds, as is illustrated by the RVC in (56). According to Li, (56a) is produced by the RVC with a theta-grid of <1,1'>. But again, he stops short of considering how (56b) is produced.

In general, the approaches discussed above seem to be largely within transformational frameworks. That is, if certain conditions are right, the RVC can produce two different structures which have been assumed to have exactly the same meaning. This is argued in Gao (1995) not always to be true. Earlier, I have shown that there are cases where the *bǎ*-structure cannot occur with idiomatic expressions that we find to be typical of some VO structures in (16) and (17). Gao (1995) has also shown that there is also a meaning shifting in the same RVC when different structures are produced. Examine the following examples from Gao (1995).

(58) a. Tāmen chīwán-le fàn.
they eat-finished-PER meal
'They have finished eating their meal.'

b. Tāmen bǎ fàn chīwán-le.
they BA meal eat-finished-PER
'They have finished all the food (after eating).'

The difference in the translations are not exaggerated. As we can see, in (58a) the focus of the RVC is on the first component and therefore we understand that the action *chī* 'eat' is done. There is no clear indication as to what exactly happens to the food. However, in (58b) the focus is shifted to the second component verb *wán* 'finished'. That is, the sentence is understood to emphasize on the fact that the food is now gone. Thus how the food is gone or who ate it is only of secondary importance. When we put these sentences into contexts, the difference is more transparent.

(58) c. Tāmen bǎ fàn chīwán-le. Zánmen qù fànguǎn ba.
they BA meal eat-finished-PER we go restaurant PARTICLE
'They have finished all the food. Let's go to a restaurant.'

d. #Tāmen chīwán-le fàn. Zánmen qù fànguǎn ba.
they eat-finish-PER meal we go restaurant PARTICLE
'They have finished eating their meal. Let's go to a restaurant.'

In (58c-d) we have a situation where it is necessary to make a suggestion to go to a restaurant (to get food). And a good reason for making such suggestion is that there is no

more food left for us here. Since (58a) does not carry this information, only (58b) is appropriate in this situation.

The sentences in (59) provides another case in which the *bǎ*-construction and the non-*bǎ*-construction carry different information.

(59) a. Tā bǎ érzi diū-le.
he BA son lose-PER
'He has caused the loss of his son.'

b. Tā diū-le érzi.
he lose-PER son
'He has lost his son.'

c. Lǐsì zhēn cūxīn. Tā bǎ érzi diū-le.
Lisi really careless he BA son lose-PER
'Lisi is really careless. He has lost his son.'

d. Lǐsì zhēn cūxīn. #Tā diū-le érzi.
Lisi really careless he lose-PER son

Although both (59a) and (59b) are well-formed expressions, the inappropriateness of (59b) in the situation where Lisi's careless is suggested to be the reason he has lost his son indicates that they carry different (aspects of the) information: while Lisi is blamed on losing his son in (59a), the speaker's intention is not clear in (59b) whether Lisi should be held responsible. Thus only (59a) can be seen as the consequence of his carelessness and (59b) is simply a statement of the event that Lisi lost his son. In other words, (59b) put emphasis on the event while (59a) emphasize the effect of the event.

The shifting of emphasis on the two components can also been seen in the structure itself. In the transitive version of the RVC, as is the case of (55a), the head is the first component *hē* 'drink', which requires two arguments. This becomes a requirement of the RVC as a whole due to the Head-Feature Percolation Principle. Thus the RVC has to be transitive. This is exactly the analysis of Li (1990). However, Li does not look at the possibility that, in (55b), the head of the RVC imay be shifted to the second component *guāng* 'empty', which is an intransitive verb. Thus, if we assume the Head-Feature Percolation Principle, then the RVC in this case must also be an intransitive verb. An intransitive verb generally requires only one argument because there is only one Case position. But since the compounding procedure produces two arguments for the RVC *hēguāng* 'drink to empty', we must either find a Case for the second argument or drop one of the arguments. We can do the first because in Chinese a marked complement is a position marked by a (Case) marker. In this case, the marker is *bǎ* and we have (55b) as a result. If we choose the second option, we must drop the first argument *Zhāngsān* because

it is not on the list of the head component verb *guāng*, as stipulated by the Head Feature Percolation principle. This is confirmed in the following.

(55) c. Jiu hēguāng-le.
wine drink-empty-PER
'The wine is has been drunk up.'

d. *Zhāngsān hēguāng-le.
Zhangsan drink-empty-PER
Intended: 'Zhangsan has drunk all (the wine).'

Thus if we only assume that in an RVC the head is always the first member, then the examples in (55) are not explainable.

Thus I have shown that what is missing in Li (1990)'s analysis is consideration of the case where the second member of the RVC is the head of the compound. Thus in our analysis, we will consider both left-headed and right-headed RVCs.

6.2.2.1. An Overview of RVCs

Before I state the principles and rules governing RVCs, let's first have an overview of the RVCs and their relations to their components. As has been stated earlier, an RVC is generally composed of two verb lexemes, known as V1 and V2. Each component verb has its own SUBCAT list. Following traditional notation, the SUBCAT list is represented in this overview as a list of numbers, with the most agent-like argument as one. Thus for the verb of *zhuī* 'chase', the argument list is <1,2>, representing the chaser and the chased, respectively. For a single-argument intransitive verb such as *lèi* 'be tired', the argument list is a singleton list <1>. I also assume with the traditional analysis that only primitive arguments take part in the compounding process. A primitive argument is an obligatory argument which, when all the arguments of a verb are lexicalized, takes either the subject or the object position. Unlike the traditional analysis, I assume that the head of an RVC can be either the first component or the second. Thus for each RVC, both the left-headed and the right-headed compounds are considered. With headedness also comes the transitivity agreement principle, which states that the transitivity of the RVC is the same as its head component. Thus, for the RVC *zhuīlèi* 'chase-tired' the left-headed compound must always be transitive and the right-headed compound should always be intransitive. However, middle transitivization and agent argument suppression rules apply to all intransitive middle RVCs. These assumptions will give rise to a variety of possibilities when two verbs combine to form an RVC. Take *zhuīlèi* for example. It is made of two stems, *zhuī* 'chase', which is a transitive verb when used independently, and *lèi* 'be tired', which is intransitive. The following sentences are all possible with this RVC.

(60) a. Zhāngsān zhuīlèi-le Lǐsǐ.
Zhangsan chase-tired-PER Lisi
b. 'Zhangsan chased Lisi and got himself (=Zhangsan) tired.'
c. 'Zhangsan chased Lisi and got him (=Lisi) tired.'
d. 'Chasing Zhangsan made Lisi tired.'
e. 'Zhangsan chased (someone) and got Lisi tired.'

f. Zhāngsān bǎ Lǐsǐ zhuīlèi-le.
Zhangsan BA Lisi chase-tired-PER
g. 'Zhangsan chased Lisi and got him tired.'
h. 'Chasing Zhangsan made Lisi tired.'
i. 'Zhangsan chased (someone) and got Lisi tired

j. Zhāngsan zhuīlèi-le.
Zhangsan chase-tired-PER
k. 'Zhangsan was tired after being chased.'
l. 'Zhangsan was tired after chasing someone.'

As we can see from (60), the possibilities for the combination of two verbs to form a RVC can be a very complicated issue. However, there are patterns in (60) that can help us understand the structures of RVCs. For instance, with the *bǎ*-construction in (60f), all the readings indicate that *Lǐsǐ*, the argument of the second component verb (hereafter V2), is the person that must be tired.

In (60) we also see that when the two verbs combine to form an RVC, their arguments are not just simply concatenated. They may also undergo what is traditionally known as argument identification. That is, some arguments from the first component verb may be the same as some arguments from the second and therefore are realized as the same lexical items. For instance, in (60b) the agent of *zhuī* is Zhangsan and theme of *lèi* is also Zhangsan. Therefore they are realized as one and the same constituent in the RVC sentence. When two arguments are identified, the numbers representing them are hyphenated. So the argument structure of (60b) is shown as <1-1', 2>, where the primed number indicates an argument from the non-head component.

Having laid out the formalism, let's start our overview of RVCs with (<1>,<1'>) and (<1'>,<1>) combinations.

6.2.2.2. (<1>,<1'>) and (<1'>,<1>) Compounds

When the component verbs both have only one argument, the left-headed combination (<1>,<1'>) can have only one possible output: <1-1'>. That is, the two arguments must be identified. For if they were not, there would be two distinct arguments for the resulting RVC. Since the left-headed RVC is required by the transitivity agreement principle to be an intransitive verb and an intransitive verb does not take any object, the two argument

structure <1,1'> will be ruled out as an impossible sentence.[8] The RVC is illustrated in the following with the two component verbs *kū* 'cry' and *xǐng* 'be awake' in (61) and *è* 'be hungry' and *hūn* 'faint' in (62).

(61) Lǐsī kūxǐng-le.
Lisi cry-awake-PER
'Lisi cried himself awake.'

(62) Zhāngsān èhūn-le.
Zhangsan hungry -PER
'Zhangsan is faint from hunger.'

For the right-headed combination (<1'>,<1>), there are two possibilities. The first is when the two arguments are identified and this gives us the same RVC <1'-1> as the left-headed one. The second is when the two arguments are not identified and we have an <1',1> RVC, where the first argument is selected as the subject and the second as a *bǎ*-marked complement. Thus it is still an intransitive verb and meets the head feature transitivity agreement principle. This is exemplified by the (a) sentence in (63). Since it is a *bǎ*-construction and the RVC is a middle verb, applying the middle transitivization rule will give us the (b) sentences and suppressing the agent argument gives us the (c) sentences.

(63) a. Lǐsī bǎ wo xiàoshǎ-le.
Lisi BA I laugh-confused-PER
'Lisi's laugh confused me.'

b. Lǐsī xiàoshǎ-le wo.
Lisi laugh-confused-PER I
'Lisi's laugh confused me.'

c. Wo xiàoshǎ-le. (≠ <1-1'> or <1'-1>)
I laugh-confused-PER
'I was confused with (someone's) laugh.'

(64) a. Lǐsī bǎ tā kūxǐng-le.
Lisi BA he cry-awake-PER
'Lisi cried him awake.'

b. Lǐsī kūxǐng-le tā.
Lisi cry-awake-PER he
'Lisi cried him awake.'

c. Tā kūxǐng-le.(≠ <1-1'> or <1'-1>)
he cry-awake-PER
'He was awakened from the crying.'

[8] Alternatively, one might suggest that the V2 argument should be realized as a *bǎ*-marked complement, hence making (64a) spuriously ambiguous. However, close connection between marked complement and the SOV word order suggests that *bǎ*-phrase should only be linked to right-headed RVCs. Therefore no consideration is given to the alternative suggestion that left-headed RVCs may produce *bǎ*-marked complements.

6.2.2.3. (<1,2>,<1'>) and (<1',2'>,<1>) Compounds

First we look at the left-headed (<1,2>,<1'>) combination. The possibilities are <1-1',2>, where the non-head argument is identified with the agent argument of the head, <1,2-1'>, where the non-head argument is identified with the most patient argument of the head, and <1,2,1'>, where no arguments are identified. The first two types are illustrated as (65) and (66), respectively. However, the <1,2,1'> RVC is ruled out because there is one argument too many for the transitive verb.

(65) Zhāngsān chībǎo-le fàn
Zhangsan eat-full-PER meal
'Zhangsan ate the meal and was full.'

(66) Lǐsī xiuhǎo-le qìchē.
Lisi repair-good-PER car
'Lisi has fixed the car.'

Next, we look at (<1',2'>,<1>) combinations. Since the head component is an intransitive, there are three possible outcomes: the first argument of V1 is identified with the head argument and we have <2',1'-1>; the second argument of V1 is identified with the head argument and we have <1',1-2'>; and no argument is identified and we have <1',2',1>. The first two cases are illustrated with the (a) sentences in (67) and (68), respectively. Since they are middle verbs and the (b) sentences are the transitivized versions, when the most agent-like argument is suppressed, we have the (c) sentences.

(67) a. Nèi-wǎn fàn bǎ Zhāngsān chībǎo-le.
that-CL meal BA Zhangsan eat-full-PER
'The bowl of rice made Zhangsan full after he ate it .'

b. Nèi-wǎn fàn chībǎo-le Zhāngsān.
that-CL meal eat-full-PER Zhangsan
'The bowl of rice made Zhangsan full after he ate it .'

c. Zhāngsān chībǎo-le.
Zhangsan eat-full-PER
'Zhangsan was full after he ate (something) .'

(68) a. Lǐsī bǎ qìchē xiuhǎo-le.
Lisi BA car repair-good-PER
'Lisi has fixed the car.'

b. Lǐsī xiuhǎo-le qìchē.
Lisi repair-good-PER car
'Lisi has fixed the car.'

c. Qìchē xiuhǎo-le.
car repair-good-PER
'The car has been fixed.'

Note that (67a) is produced with the order of the two argument of the V1 reversed. This is impossible in traditional analyses, where V1 is always treated as the head and the argument

structure of the head component must always be respected during the compounding procedure (Li 1990, Chang 1989).

For the third case, we have a RVC with three arguments. Since it is required to be an intransitive, the most agent-like argument, which is the first argument of V1, is selected as the subject and the most patient-like argument, which is the argument of V2, becomes the affected theme and is realized as a *bǎ*-marked complement. Now, the question is how the second argument of V1 should be handled. It is neither the most agent-like nor the affected theme and there is no appropriate marker in Chinese to mark the argument so that it can be a marked complement. It has been suggested (Li 1990, Gao 1995) that it can be marked by a repeated V1, as is the following.

(69) a. Zhāngsān chī pútao bǎ dùzi chīhuài-le.
Zhangsan eat grape BA stomach eat-bad-PER
'Zhangsan ate grapes and his stomach was upset.'

b. Zhāngsān chī pútao chīhuài-le dùzi.
Zhangsan eat grape eat-bad-PER stomach
'Zhangsan ate grapes and upset his stomach.'

c. Dùzi chī pútao chīhuài-le.
stomach eat grape eat-bad-PER
'(Someone) ate grapes and upset his stomach.'

Since (69a) is a middle verb, it is transitivized and we have (69b). When the most agent-like argument is suppressed, we have (69c). However, the problem with (69) is that the repeated verb *chī* is not a marker because the phrase it 'marks' can appear in front of the subject with the *chī* still attached to it. This is shown in (70).

(70) a. Chī pútao, Zhāngsān bǎ dùzi chīhuài-le.
eat grape Zhangsan BA stomach eat-bad-PER
'Eating grapes, Zhangsan's stomach was upset.'

b. Chī pútao, Zhāngsān chīhuài-le dùzi.
eat grape Zhangsan eat-bad-PER stomach
'Eating grapes, Zhangsan upset his stomach.'

c. Chī pútao, dùzi chīhuài-le.
eat grape stomach eat-bad-PER
'Eating grapes, (someone's) stomach was upset.'

I suggest that since there is no marker to mark the second argument of V1, it is reduced to an adjunct VO phrase that behaves like an absolute structure. Note that this VO phrase is also optional.

(70) c. Zhāngsān bǎ dùzi chīhuài-le.
Zhangsan BA stomach eat-bad-PER
'Zhangsan's stomach was upset after he ate something.'

d. Zhāngsān chīhuài-le dùzi.
Zhangsan eat-bad-PER stomach
'Zhangsan ate something and upset his stomach.'

e. Dùzi chīhuài-le.
stomach eat-bad-PER
'(Someone) ate something that upset his stomach.'

6.2.2.4. (<1>,<1',2'>) and (<1'>,<1,2>) Compounds

Generally speaking, there is no possible RVC with the (<1>,<1',2'>) combination because all the possible outcomes with such a combination have more than one argument and the left headed RVC is required to be intransitive and can only take one argument.

The (<1'>,<1,2>) combination have three possibilities: the V1 argument is identified with the first argument of the head and we have <1'-1,2>; or it is identified with the second argument of V2 and we have <1,1'-2>. The third possibility is that no argument is identified and we have <1',1,2>. Genuine examples of <1,1'-2>[9] are hard to come by but <1'-1,2> and <1',1,2> RVCs are illustrated below.

(71) a. Zhāngsān zǒujìn-le jiàoshì.
Zhangsan walk-enter-PER classroom
'Zhangsan has walked into the classroom.'

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9 The following sentences possibly fit in this category.

(i) Yóudìyuan cuòsòng-le yí-jiàn bāoguǒ..
postman wrong-deliver-PER one-CL parcel
'The postman delivered a wrong parcel.'

(ii) Zhāngsān shēngchī-le yì-kuai ròu.
Zhangsan raw-eat-PER one-CL meat
'Zhangsan has eaten a piece of meat raw.'

I am not absolutely sure about these sentences for the following reasons. First, it is not very clear whether the argument of V1 is the subject or the object of each sentence. For instance, (i) could also mean that the postman was wrong when he delivered a parcel, although I know for sure that in (ii) the meat is understood to be raw, not Zhangsan. However, *shēng* 'to be raw' in (ii) can also appear in a progressive form, as is shown in (iii), making the verb function as a adverbial, hence undermining the likelihood that *shēngchī* is a RVC.

(iii) Zhāngsān xǐhuān shēng-zhe chī ròu.
Zhangsan like raw-PROG eat meat
'Zhangsan likes to eat meat raw.'

Second, there are alternative forms for some of these verbs. For instance, *cuòsòng* in (i) seems to have a more popular form *sòngcuò* as is shown in (iv) below.

(iv) Yóudìyuan sòngcuò-le yí-jiàn bāoguǒ..
postman deliver-wrong-PER one-CL newspaper
'The postman delivered a wrong parcel.'

Cf. c. *Zhāngsān bèi-zǒujìn-le jiàoshì.
Zhangsan BEI-walk-enter-PER classroom

(72) a. Xiǎo māo tiàozài-le zhuōzi-shàng.
little cat jump-at-PER table-top
'The little cat has jumped onto the table.'

Cf. c. *Xiǎo māo bèi-tiàozài-le zhuōzi-shàng.
little cat BEI-jump-at-PER table-top

(73) a. Zhāngsān bǎ tiěshù kūkāi-le huā.
Zhangsan BA iron-tree cry-blossom-PER flower
'Zhangsan cried the iron tree abloom.'

b. Tiěshù kūkāi-le huā.
iron-tree cry-blossom-PER flower
'The iron tree was cried abloom.'

Cf. c. Tiěshù bèi-kūkāi-le huā.
iron-tree cry-blossom-PER flower
'The iron tree was cried abloom.'

(74) a. Lǐsi bǎ yàoshi tiàozài-le dìshàng.
Lisi BA key jump-at-PER floor-top
'Lisi jumped and (his) key fell on the floor.'

b. Yàoshi tiàozài-le dì-shàng.
key jump-at-PER floor-top
'(Someone's) key fell on the floor because of (his) jumping.'

Cf. c. Yàoshi bèi-tiàozài-le dì-shàng.
key jump-at-PER floor-top
'(Someone's) key fell on the floor because of (his) jumping.'

Note that the (un)acceptable (c) sentences show that only (73b) and (74b) are middle verbs that have a passive reading.

6.2.2.5. (<1,2>,<1',2'>) and (<1',2'>,<1,2>) Compounds

With a (<1,2>,<1',2'>) compound, only one outcome is possible. That is when both arguments of V2 are identified with the arguments of the head. For other argument structures will have more than two arguments and the RVC cannot take them. The <1-1',2-2'> structure is illustrated in (75).

(75) Zhāngsān wèndǒng-le nèi-ge wènti.
Zhangsan ask-understand-PER that-CL question
'Zhangsan understood the question by asking it.'

As for the right headed combination (<1',2'>,<1,2>), things will be a little different. This is because there can be as many as three arguments for the right headed RVC, the subject, the object, and the *bǎ*-marked complement. Thus the outcomes can be <2',1'-1,2>, <1',2'-1,2>, <2',1,1'-2>, and <1',1,2'-2>. They are illustrated in the following examples.

(76) a. Nèi yi jiào bǎ tā shuǐdào-le Shànghǎi.
that one sleep BA he sleep-arrive-PER Shanghai
'He slept (a sleep) all the way to Shanghai.'

b. Tā shuǐdào-le Shànghǎi.
he sleep-arrive-PER Shanghai
'He slept all the way to Shanghai.'

(77) a. Zhāngsān bǎ qìchē kāijìn-le chēfáng.
Zhangsan BA car drive-enter-PER garage
'Zhangsan drove the car into the garage.'

b. Qìchē kāijìn-le chēfáng.
car drive-enter-PER garage
'The car was driven into the garage.'

(78) a. Nèi-chǎng qíu bǎ guānzhòng tífú-le Guǎngdōng duǐ.
that-CL ball BA audience kick-convinced-PER Guangdong team
'The Guangdong Soccer Team played the game (so well) that the spectators were won over.'

(79) a. Lǐsi bǎ Liúèr chànghuǐ-le nèi-shou gē.
Lisi BA Liuer sing-know-PER that-CL song
'Lisi sang the song (so much) that Liuer could sing it.'

b. Liúèr chànghuǐ-le nèi-shou gē. (≠ <1-1', 2-2'> or <1'-1, 2'-2>)
Liuer sing-know-PER that-CL song
'(Someone) sang the song (so much) that Liuer could sing it.'

If there is no argument that can be identified, then we have a four argument RVC, which is ruled out as unacceptable because no verbs takes four primitive arguments[10] in Chinese.

6.2.2.6. The V-*le* Compounds

We have discussed the formation of RVCs and it has so far appeared that the *bǎ*-phrase is generated only with a right-headed RVC. But examine the following.

(80) a. Zhāngsān bǎ lǎopo sǐ-le.
Zhangsan BA wife die-LE/PER
'Zhangsan's wife has died on him.'

(81) a. Tā bǎ júzi bō-le pí.
he BA orange peel-LE/PER skin
'He has peeled the orange off its skin.'

The problem with the above examples is that the verb in each sentence seems to be only a simple one with a tense marker *-le*. However, I will show that *-le* in this case is not just a tense marker, it is a verb as well.

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[10] Although a repeated V1 can save a 4-argument RVC. Examine the following.

(i) Zhāngsān tī zhúqiú bǎ Lǐsi tíduàn-le yì-tiáo tuǐ
Zhangsan kick foot-ball BA Lisi kick-break one-CL leg
'Zhangsan broke Lisi's leg when he played the soccer.'

First, the negation of the perfective tense marker *-le* is *méiyǒu* in Chinese; they are mutually exclusive within a single clause. Examine the following.

(82) a. Jiā-lǐ lái-le xǔduo rén.
home-inside come-PER many person
'A lot of people have come to our home.'

b. Jiā-lǐ méiyǒu lái(*-le) xǔduo rén.
home-inside not-PER come(*-PER) many person
'No one has/not many people have come to our home.'

Thus, if *-le* is only a perfective tense marker in (80a) and (81a), the negation of the sentences will make it unacceptable. (Cf. Gao 1992 and 1994) But this is not the case.

(80) b. Zhāngsān méiyǒu bǎ lǎopo sǐ*(-le).
Zhangsan not-PER BA wife die-LE
'Zhangsan's wife has not died on him.'

(81) b. Tā méiyǒu bǎ júzi bó*(-le) pí.
he not-PER BA orange peel-LE skin
'He has not peeled the orange off its skin.'

The fact that both *-le* and *méiyǒu* can appear in a single clause suggests that *-le* is not a tense marker in the above sentences.

Second, in some northern dialects, the *-le* in (80) and (81) is pronounced as *-lao*, a weakened pronunciation for the verb *liǎo* 'conclude/close/no more' as in *liǎojié* 'close and conclude' or *liǎoquè* 'close and take away' in the following sentences.

(83) Zhè-jian shǐ jiu zhèyàng liǎojí-le.
this-CL matter just this-way close-conclude-PER
'This matter is thus concluded and closed.'

(84) Zhèyàng yě hǎo, ràng wǒ liǎoquè-le yī-jiàn xīnshǐ.
this-way also good let I close-no-more-PER one-CL heart-matter
'This is good. That's a load off my mind.'

Thus, I will take *-le* in (80) and (81) as the second component verb and analyze it as such. In (80) *-le* meaning 'gone' is an intransitive verb and the compound has the argument structure as <1',1-2'>. In (81), on the other hand, the verb *-le* meaning 'have no more' is a transitive verb and has the argument structure <1',1-2',2>. Please note that the second component verb is necessary in both sentences. Otherwise the structures are not acceptable. This is shown in the (c) examples.

(80) c. *Zhāngsān bǎ lǎopo sǐ.
Zhangsan BA wife die
Intended: 'Zhangsan's wife dies on him.'

(81) c. *Tā bǎ júzi bó pí.
he BA orange peel skin
Intended: 'He peels the orange off its skin.'

Finally, here is one set of sentences to illustrate the analysis.

(85) a. Zhāngsān bǎ nèi-píng jiàngyóu dǎ-le.
Zhangsan BA that-bottle soy-sauce hit-LE/PER
'Zhangsan has (hit the bottle and) spilt the soy sauce.'

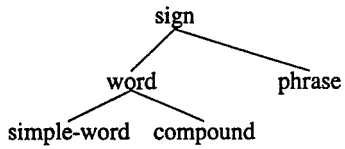
b. Zhāngsān méiyǒu bǎ nèi-píng jiàngyóu dǎ-le.
Zhangsan not-PER BA that-bottle soy-sauce hit-LE/PER
'Zhangsan has not (hit the bottle and) spilt the soy sauce.'

c. *Zhāngsān bǎ nèi-píng jiàngyóu dǎ.
Zhangsan BA that-bottle soy-sauce hit

6.2.3. Verb Compounding Rules

The above analysis of the argument structures of compound verbs can be incorporated into the current framework, following the proposal regarding compounds in Chung (1997). Chung suggests that the sort *sign* has two subsorts, *phrase* and *word*, and the sort *word*, in turn, has two subsorts *simple-word* and *compound*. The sort hierarchy of a sign is shown as (86).

(86)



The sort *compound* is needed because in HPSG, as in many other syntactic frameworks, the lexical head of a sentence is not a phrase. But a compound verb is not a typical word, either. The sort *word* is defined as a syntactic unit whose internal structure is not visible from the level of syntax. A compound verb in Chinese is made up, usually, of two otherwise full verbs with their own internal argument structures, which, in turn, will eventually contribute to and influence the argument structure of the compound verb. Thus I assume that Chinese compound verbs are of the sort *compound*, which functions syntactically as a word but whose internal makeup is (partially) relevant to the phrase structure of the sentence, by virtue of how the component verbs contribute to the argument structure of the compound.

As we have seen in previous sections, two verb lexemes may combine to form a new compound lexeme and the compound verb can be either transitive or intransitive, depending on the transitivity of the head component. This phenomenon is described as the Transitivity Agreement Principle.

(87) a. Transitivity Agreement Principle (TAP)

The transitivity of an RVC lexeme is the same as that of the head verb lexeme and the (order of the) argument structure of the head lexeme must be preserved in the RVC.

Thus, the Transitivity Agreement Principle requires an RVC to be transitive if the head component is transitive and to be intransitive if the head component is intransitive. The argument structure in TAP refers to the ordered list of the SUBCAT value. Note that TAP only requires that the order of the SUBCAT list of the head component be respected, in the sense to be defined below. We have already seen that the order of the non-head argument list may be reversed in (67), (76), and (78). We have also seen that some of the non-head arguments may not be lexically realized.

When two verb lexemes combine, their thematic roles are embedded in a new predication. Thematic role embedding takes place in the CONTENT value, following the Semantic Embedding Principle in (87b).

(87) b. Semantic Embedding Principle (SEP)

When two verbs combine to form a resultative verb compound, the CONTENT value of the first component verb becomes the value of a new feature CAUSE and the value of the second component verb becomes the value of a new feature AFFECTED.

Both CAUSE and AFFECTED are the features on the CONTENT value of the RVC. The SEP basically states that when an RVC is formed, a new predication *causation* is created. Under this relation, the CAUSE velue is the CONTENT value of V1 and the AFFECTED value is the CONTENT value of V2, as is illustrated in (88).

(88) Thematic Role Embedding in RVC

$$\left\langle \begin{bmatrix} \text{SYNSEM|LOCAL|CONT } \boxed{5} \begin{bmatrix} \textit{relation} \\ \text{ROLE } \boxed{1} \\ \text{ROLE } \boxed{2} \end{bmatrix} \end{bmatrix} \begin{bmatrix} \text{SYNSEM|LOCALCONT } \boxed{6} \begin{bmatrix} \textit{relation} \\ \text{ROLE } \boxed{3} \\ \text{ROLE } \boxed{4} \end{bmatrix} \end{bmatrix} \right\rangle$$

$$\Downarrow$$

$$\begin{bmatrix} \text{SYNSEM|LOCAL|CONT } \begin{bmatrix} \textit{causation} \\ \text{CAUSE } \boxed{5} \\ \text{AFFECTED } \boxed{6} \end{bmatrix} \end{bmatrix}$$

A consequence of the semantic embedding is that the thematic properties of each argument must also be adjusted. For each argument from V1, the proto-agent property of causation is added because they are in the causing event, and for each argument from V2, the proto-patient property of being causally affected is added. That is, all the arguments from V1 are

made more agent-like and the arguments from V2 are made more patient-like. Thus, for the SUBCAT list, if no argument is identified, the argument list of RVC is simply the concatenation of the SUBCAT lists of V1 and V2, following the Argument Concatenation and Identifation Principle below.

(87) c. Argument Concatenation and Identification Principle (ACIP)

When two verbs combine to form a resultative verb compound, the SUBCAT list of V2 is appended to the SUBCAT list of V1 to form the SUBCAT list of the RVC, except that one or more non-head arguments can be absorbed into arguments of the head component. Only the thematic properties of the head argument prevail in the identification

Thus, for the combination of every two verb lexemes, there are two compounding rules, left-headed and right-headed. These rules are given below.

(89) Left-Headed Compounding Rule

$$\left\langle \begin{bmatrix} \text{PHON } \boxed{1} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{TYPE } \boxed{3}\end{bmatrix} \\ \text{SUBCAT } \boxed{5} \\ \text{CONT } \boxed{7} \end{bmatrix} \begin{bmatrix} \text{PHON } \boxed{2} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{TYPE } \boxed{4}\end{bmatrix} \\ \text{SUBCAT } \boxed{6} \\ \text{CONT } \boxed{8} \end{bmatrix} \right\rangle$$

$$\Downarrow$$

$$\begin{bmatrix} \text{PHON } \textit{append}(\boxed{1},\boxed{2}) \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{TYPE } \boxed{3}\end{bmatrix} \\ \text{SUBCAT } \textit{append}(\boxed{5},\boxed{6}) \\ \text{CONT } \begin{bmatrix} \textit{causation} \\ \text{CAUSE } \boxed{7} \\ \text{AFFECTED } \boxed{8} \end{bmatrix} \end{bmatrix}$$

where $*\boxed{5} < \boxed{6}$ [11]

[11] The restriction is to prevent overgeneration of multiple arguments with an intransitive RVC, to be explained later in the chapter.

(90) Right-Headed Compounding Rule

$$\left\langle \begin{bmatrix} \text{PHON } \boxed{1} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{TYPE } \boxed{3}\end{bmatrix} \\ \text{SUBCAT } \boxed{5} \\ \text{CONT } \boxed{7} \end{bmatrix}, \begin{bmatrix} \text{PHON } \boxed{2} \\ \text{HEAD } \textit{verb}\begin{bmatrix}\text{TYPE } \boxed{4}\end{bmatrix} \\ \text{SUBCAT } \boxed{6} \\ \text{CONT } \boxed{8} \end{bmatrix} \right\rangle$$

$$\Downarrow$$

$$\begin{bmatrix} \text{PHON } \textit{apend}\langle \boxed{1}, \boxed{2} \rangle \\ \text{HEAD } \textit{verb-mid}\begin{bmatrix}\text{TYPE } \boxed{4}\end{bmatrix} \\ \text{SUBCAT } \textit{apend}\langle \boxed{5}, \boxed{6} \rangle \\ \text{CONT } \begin{bmatrix} \textit{causation} \\ \text{CAUSE } \boxed{7} \\ \text{AFFECTED } \boxed{8} \end{bmatrix} \end{bmatrix}$$

As we can see, the difference between the two rules is how the transitivity of the RVC is determined. Right-headed compounding forms middle verbs. As stated in ACIP, when two arguments are identified into one lexical item, their thematic properties are not just simply added together. In fact, the thematic properties of the non-head argument are dropped. This means that if V1 is the head, then the identified argument keeps only the proto-agent properties. If V2 is the head, the identified arguments only keeps the proto-patient properties. When both V1 and V2 have only one argument, this does not seem to make any difference. However, when V1 is transitive with two arguments, different RVCs are formed. Examine the following.

(91) a. When V1 is the head

$$\left\langle \begin{bmatrix} \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT } \langle \boxed{1}\text{NP}, \boxed{2}\text{NP} \rangle \end{bmatrix}, \begin{bmatrix} \text{HEAD } \textit{verb-intr} \\ \text{SUBCAT } \langle \boxed{3}\text{NP} \rangle \end{bmatrix} \right\rangle$$

$$\Downarrow$$

$$\begin{bmatrix} \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT } \langle \boxed{1}\text{NP} = \boxed{3}, \boxed{2}\text{NP} \rangle \end{bmatrix}$$

b. When V2 is the head

$$\left\langle \begin{bmatrix} \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT } \langle \boxed{1}\text{NP}, \boxed{2}\text{NP} \rangle \end{bmatrix}, \begin{bmatrix} \text{HEAD } \textit{verb-intr} \\ \text{SUBCAT } \langle \boxed{3}\text{NP} \rangle \end{bmatrix} \right\rangle$$

$$\Downarrow$$

$$\begin{bmatrix} \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT } \langle \boxed{2}\text{NP}, \boxed{1} = \boxed{3}\text{NP} \rangle \end{bmatrix}$$

As we can see, (91a) produces a different SUBCAT list from (91b). The difference is illustrated in the following examples.

(92) a. Zhāngsān zhuīlèi-le Lǐsǐ. (= 60b)
Zhangsan chase-tired-PER Lisi
'Zhangsan chased Lisi and got himself (=Zhangsan) tired.'

$$\begin{bmatrix} \text{PHON } \langle \text{zhuīlèi} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT } \langle \boxed{1}\text{NP}[\text{Zhāngsān}]_{\boxed{4}} = \boxed{3}_{\boxed{6}}, \boxed{2}\text{NP}[\text{Lǐsǐ}]_{\boxed{5}} \rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{causation} \\ \text{CAUSE} \begin{bmatrix} \textit{chase} \\ \text{CHASER } \boxed{4} \\ \text{CHASED } \boxed{5} \end{bmatrix} \\ \text{CAUSED} \begin{bmatrix} \textit{tired} \\ \text{TIRED } \boxed{6} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

b. Lǐsǐ bǎ Zhāngsān zhuīlèi-le.
Zhangsan BA Lisi chase-tired-PER
'Chasing Lisi made Zhangsan tired.'

$$\begin{bmatrix} \text{PHON } \langle \text{zhuīlèi} \rangle \\ \text{SYNSEM|LOCAL} \begin{bmatrix} \text{CAT} \begin{bmatrix} \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT } \langle \boxed{2}\text{NP}[\text{Lǐsǐ}]_{\boxed{5}}, \boxed{1}_{\boxed{4}} = \boxed{3}\text{NP}[\text{Zhāngsān}]_{\boxed{6}} \rangle \end{bmatrix} \\ \text{CONT} \begin{bmatrix} \textit{causation} \\ \text{CAUSE} \begin{bmatrix} \textit{chase} \\ \text{CHASER } \boxed{4} \\ \text{CHASED } \boxed{5} \end{bmatrix} \\ \text{CAUSED} \begin{bmatrix} \textit{tired} \\ \text{TIRED } \boxed{6} \end{bmatrix} \end{bmatrix} \end{bmatrix} \end{bmatrix}$$

Both (92a) and (92b) come from compounding the same verbs *zhuī* 'chase' and *lèi* 'be tired'. However, in (92a) the argument of *lèi* is identified with the first argument of *zhuī* and therefore *Zhāngsān* is still the most agent-like argument of the ordered SUBCAT list of the compound verb. In (92b), on the other hand, it is the first argument of *zhuī* that is identified with the argument of *lèi* , and therefore *Zhāngsān* becomes the most patient-like

argument on the SUBCAT list of the compound. Since the RVC is a middle verb, *Zhāngsān* becomes the *bǎ*-marked complement.

Having laid out the compounding rules for RVCs, I now turn to specific examples for illustration.

6.2.3.1 When the Head Is Intransitive

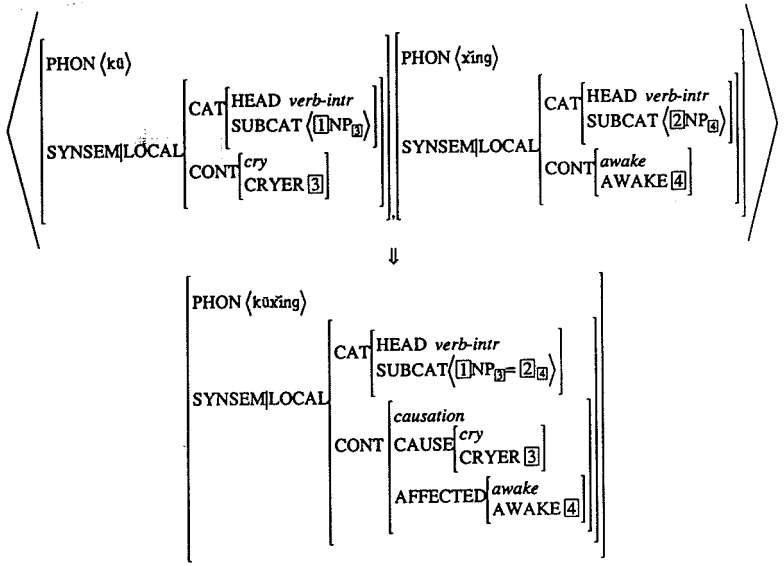
As has been shown, each stem of a compound verb in Chinese comes from a full verb with its own structured arguments. The process of the combination of the two component verbs is dealt with through lexical compounding rules. Incorporating various suggestions in the lexical approaches such as Chang (1989), Ross (1991), and especially Li (1990), I assume that verb compounding is basically an argument concatenation and identification process. This is because verb compounds are possible only when there are some natural connections between the component verbs. The connections are shown either by shared arguments or some natural development of the events denoted by the component verbs. Thus, the compound verb *kūxǐng* 'cry-be awake' is possible either because the cryer and the person who is awake are actually the same one or because the event of someone being awake can be the (natural) result of the other event of another person's crying. Therefore compounding the two intransitive verbs *kū* 'cry' and *xǐng* 'be awake' may have the following results.

First, when V1 is the head, the RVC must be intransitive. We have only one possibility, shown as (93a). That is when the argument of *xǐng* is identified with the argument of *kū*. For if no argument is identified, we will have an intransitive verb with two arguments, which is not allowed by the phrase structure, assuming that *bǎ*-phrase is only produced with right-headed RVC.

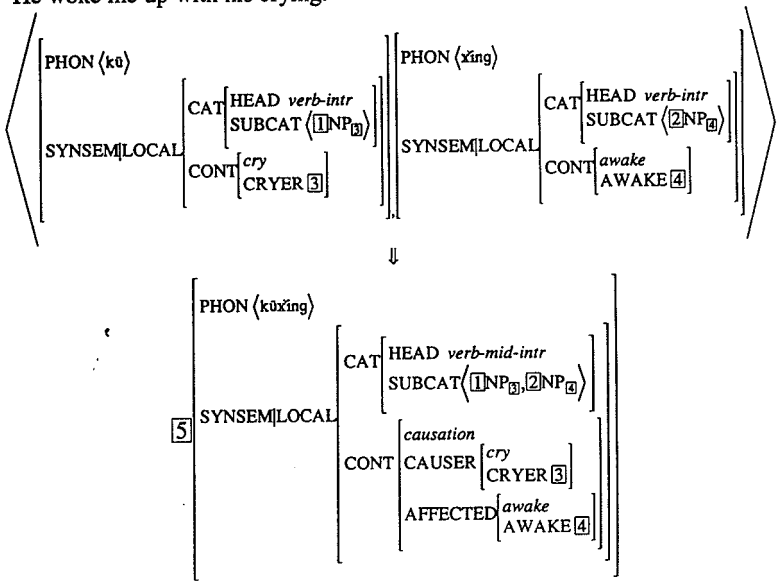
When V2 is the head, the RVC must also be intransitive. We have two possibilities: either the argument of *kū* is identified with the argument of *xǐng*, or no argument is identified. The first possibility gives us exactly the same sentence as (93a). The second possibility gives us an intransitive with two arguments. Since the resulting RVC is a right-headed middle (intransitive) verb, *bǎ* is used to mark the most patient-like argument. This is illustrated as (93b) below. As a middle verb, (93b) has the option to undergo middle transitivization or most agent-like argument suppression and we can have (93c) and (93d), respectively.

(93) Compounding *kū* 'cry' and *xǐng* 'be awake'

a. Tā kūxǐng-le.
he cry-awake-PER
'He cried himself awake.'



b. Tā bǎ wǒ kūxǐng-le.
he BA I cry-awake-PER
'He woke me up with his crying.'



c. Tā kūxǐng-le wǒ.
he cry-awake-PER I
'He woke me up with his crying.'

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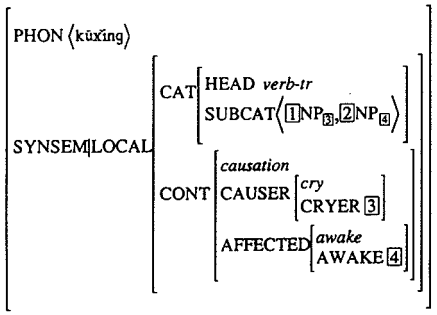

d. Wǒ kūxǐng-le.
I cry-awake-PER
'I was woken up by someone's crying.'

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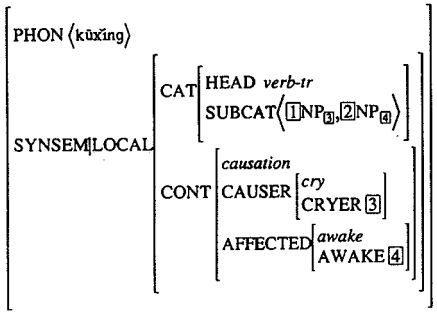
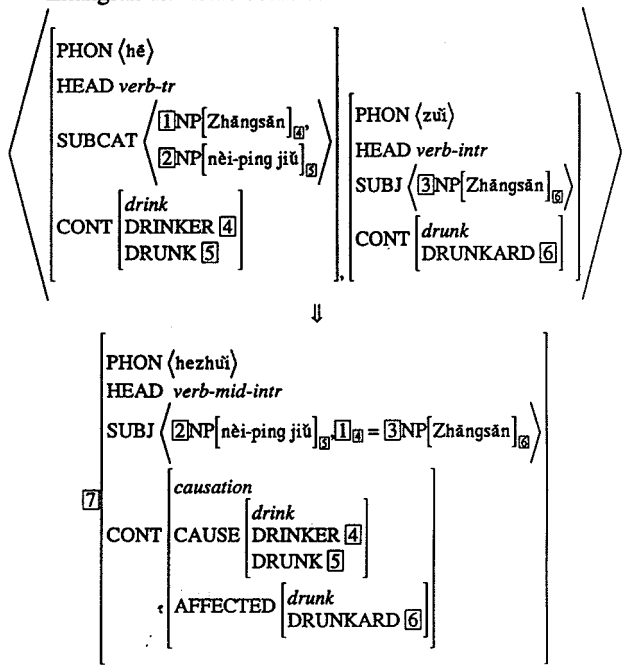


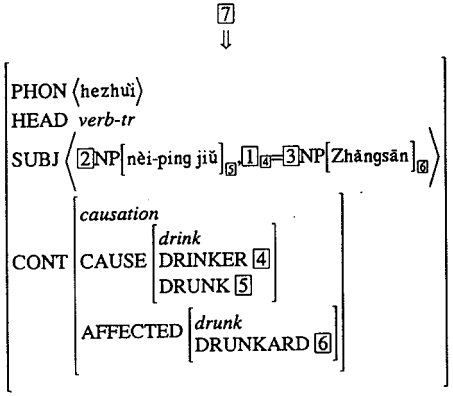
As we can see, when two intransitive verbs combine, we always get intransitive RVCs no matter in which direction they are compounded. Intransitive RVCs can also come from an intransitive head and a transitive non-head. However, when V1 is the head, an intransitive RVC is impossible because the concatenated SUBCAT list will have at least two arguments. Take *tiàozài* 'jump at' for example. It is composed of an intransitive V1 *tiào* 'jump' and a transitive *zài* 'be located at', and this verb does not have any intransitive usage. This possibility is ruled out by the restriction imposed on the left-headed RVC rule in (89), where it is made sure that the argument of V2 cannot be greater than that of V1. Thus the only intransitive RVCs that produced with an intransitive head is when V2 is the head. When V1 is transitive and V2 is the intransitive head, we have three possibilities: The

first is when the first argument of V1 is identified with the head argument. I illustrate the RVC with *hēzuǐ* 'drink to be drunk' in (94a). (94b) is the transitivized version and when the most agent-like argument is suppressed, we have (94c). The second possibility is when the second argument of V1 is identified with the head argument and the RVC is illustrated with *cāgānjìng* 'wipe clean' in (95a). Transitivising the middle verb results in (95b) and suppressing the most agent-like argument yields (95c). As for the third possibility when no argument is identified, we illustrate the RVC with *chīhuài* 'eat to upset' in (96) and give comments on it.

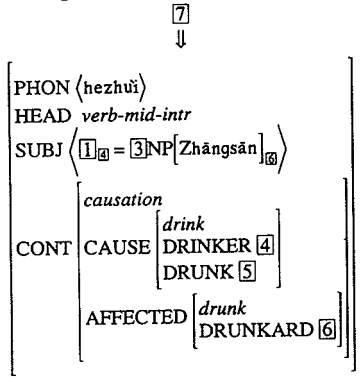
(94) a. Nèi-ping jiǔ bǎ Zhāngsān hēzuǐ-le.
that-CL wine BA Zhangsan drink-drunk-PER
'Zhangsan drank the bottle of wine and it made him drunk.'



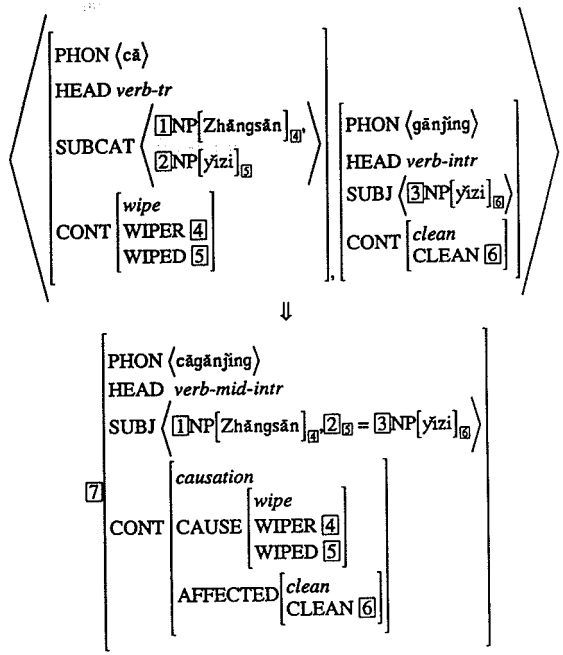
b. Nèi-ping jiǔ hēzuǐ-le Zhāngsān.
that-CL wine drink-drunk-PER Zhangsan
'Zhangsan drank the bottle of wine and it made him drunk.'



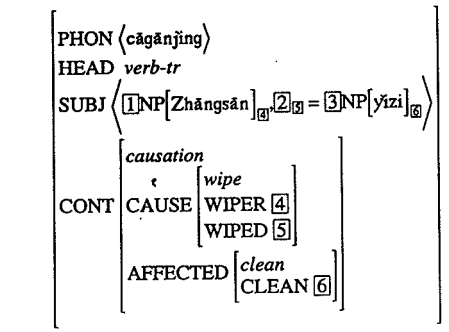
c. Zhāngsān hēzuì-le.
Zhangsan drink-drunk-PER
'Zhangsan drank something and it made him drunk.'



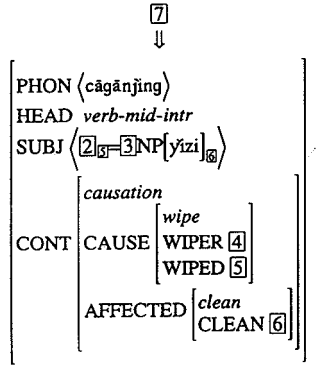
(95) a. Zhāngsān bǎ yǐzi cāgānjìng-le.
Zhangsan BA chair wipe-clean-PER
'Zhangsan has wiped the chair clean.'



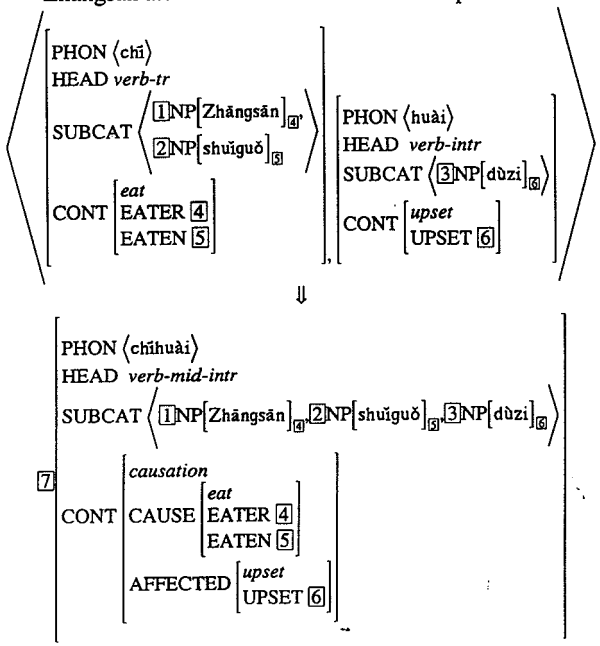
b. Zhāngsān cāgānjìng-le yǐzi.
Zhangsan wipe-clean-PER chair
'Zhangsan has wiped the chair clean.'



c. Yǐzi cāgānjìng-le.
chair wipe-clean-PER
'The chair has been wiped clean.'



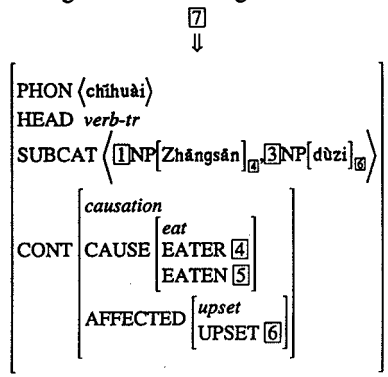
(96) a. Zhāngsān chī shuǐguǒ bǎ dùzi chīhuài-le.
Zhangsan eat fruit BA stomach eat-upset-PER
'Zhangsan ate fruits and his stomach was upset.'



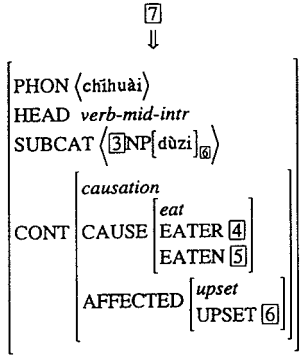
As we can see, when a transitive verb combines with an intransitive head verb with no argument identication, the result is a three argument pile-up on the SUBCAT list. TAP requires the RVC to be intransitive. Thus, the affected theme argument becomes *bǎ*-marked

complement and the most agent-like argument is selected as the subject. This leaves the less agent-like argument ***shuǐguǒ*** 'fruit' nowhere to go. Li (1990) uses the acceptable sentence in (96a) to suggest that it be marked with a repeated V1. However, V1 is not a marker and ***chī shuǐguǒ*** 'eat fruit' in (96a) does not behave like a complement. Recall that a marker is argued to be positionally determined and it only appears before argument that is between the subject and the verb. It does not appear elsewhere. Thus, the fact that ***chī shuǐguǒ*** 'eat fruit' can appear together before the subject in (97a) suggests that it is not a marked complement. I suggest that ***chī shuǐguǒ*** 'eat fruit' functions as an absolute adverbial adjunct. Perhaps reducing the argument NP ***shuǐguǒ*** 'fruit' to be in an adjunct phrase is one of the ways in Chinese to get rid of the unmarkable argument. As (97b) suggests, this argument is suppressable. As (98) suggests, the phrase ***chī shuǐguǒ*** 'eat fruit' is used to answer adjunct questions, and should be treated as adjunct. Once this unmarkable argument is properly handled, the verb behaves just like other middle verbs. This is shown in (96b) and (96c).

(96) b. Zhāngsān chīhuài-le dùzi.
Zhangsan eat-upset-PER stomach
'Zhangsan ate something and his stomach was upset.'



c. Dùzi chīhuài-le.
stomach eat-upset-PER
'(Someone's) stomach was upset (after eating something).'



(97) a. Chī shuǐguǒ Zhāngsān bǎ dùzi chīhuài-le.
eat fruit Zhangsan BA stomach eat-upset-PER
'(After) eating fruits, Zhangsan's stomach was upset.'

b. Zhāngsān bǎ dùzi chīhuài-le.
Zhangsan BA stomach eat-upset-PER
'Zhangsan ate something and his stomach was upset.'

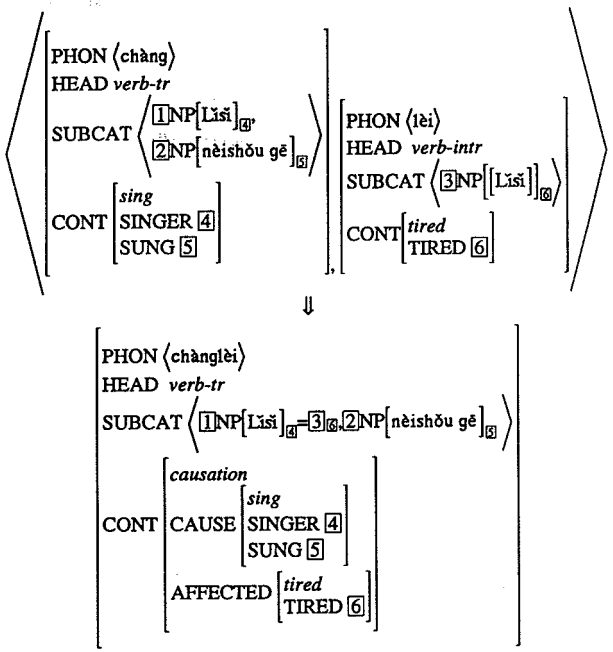
(98) A: Zhāngsān zěnme bǎ dùzi chīhuài-le?
Zhangsan how BA stomach eat-upset-PER
'How did Zhangsan upset his stomach?'

B. Zhāngsān chī shuǐguǒ bǎ dùzi chīhuài-le. (= 96a)
Zhangsan eat fruit BA stomach eat-upset-PER
'Zhangsan upset his stomach by eating some fruits.'

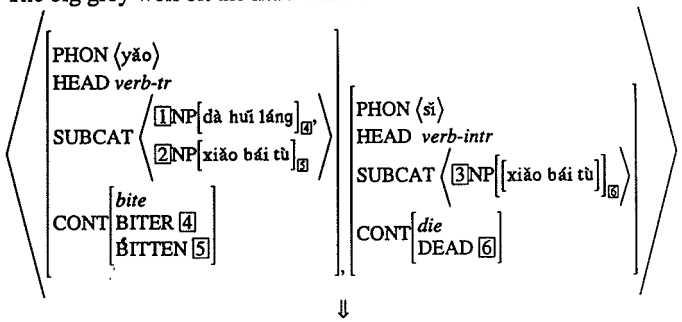
6.2.3.2. When the Head Is Transitive

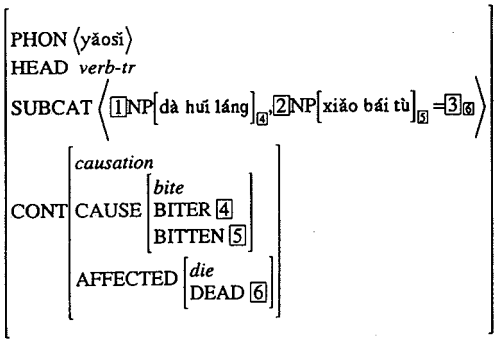
When the head is transitive, the RVC must also be transitive. This can be divided into two subcases: when the non-head is intransitive and when it is transitive. If the non-head is intransitive, for the left-headed compounding, there are three possibilities: The first is when the non-head argument is identified with the first argument of V1. I illustrate the RVC with *chànglèi* 'sing and be tired' in (99). The second is when the non-head argument is identified with the second argument of V1. This is illustrated with the compound verb *yǎosǐ* 'bite to death' in (100). When no argument is identified, we have a three argument pile-up and it is one argument too many for a normal transitive RVC.

(99) Lǐsì chànglèi-le nèi-shǒu gē.
Lisi sing-tired-PER that-CL song
'Lisi sang the song and got tired.'



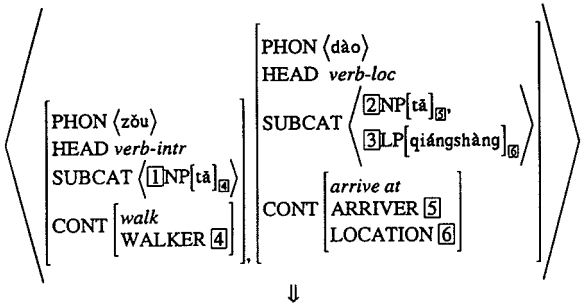
(100) Dà huí láng yǎosǐ-le xiǎo bái tù.
big grey wolf bite-die-PER small white rabbit
'The big grey wolf bit the little white rabbit to death.'





When V2 is the head, there are still three possibilities. The first is when the non-head argument is identified with the first argument of V2. I reprentent the verb with *zǒudào* 'walk to arrive at' as (101) below.[12]

(101) Tā zǒudào-le qiáng-shàng.
he walk-arrive-at-PER wall-top
'He walked onto the wall.'



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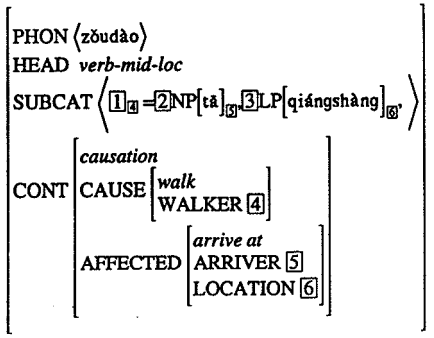
[12] The analysis also rules out the following sentences.

(i) a. *Tā bǎ qiáng-shàng zǒudào-le.
he BA wall-top walk-arrive-at-PER

b. *Qiáng-shàng zǒudào-le.
wall-top walk-arrive-at-PER

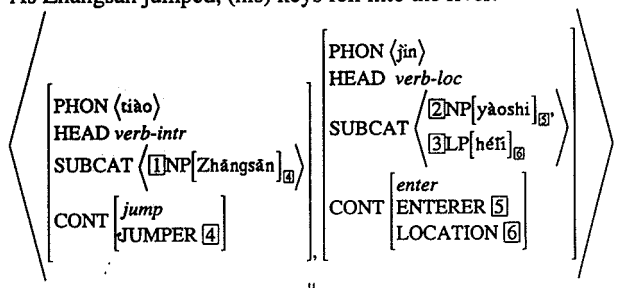
(i) is impossible because, (a) if V1 is the head, the RVC is ruled out by the restriction of the Left-headed Compounding Rule; (b) if V2 is the head, the RVC must be a locative transitive verb which requires a postverbal LP. (i) lacks such an object and therefore is not acceptable.



As we can see, even though the RVC may be still regarded as a middle construction, it is already a transitive verb and therefore it is no longer available to undergo middle transitivization, since middle transitivization rule requires its input to be an intransitive verb. Besides, the first argument of V2 is itself most agent-like argument, therefore the structure can no longer undergo agent argument suppression.

The second possibility is when the non-head argument is identified with the second argument of V2. For reasons discussed previously (Footnote 8), examples of this sort are hard to come by. The third possibility is when no arguments are identified and we have a three argument transitive RVC. It is illustrated with *tiàojǐn* 'jump into' in (102).

(102) a. Zhāngsān bǎ yàoshi tiàojǐn-le hé-lǐ.
Zhangsan BA key jump-enter-PER river-inside
'As Zhangsan jumped, (his) keys fell into the river.'



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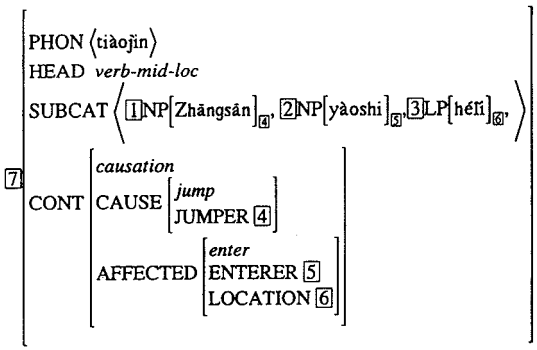
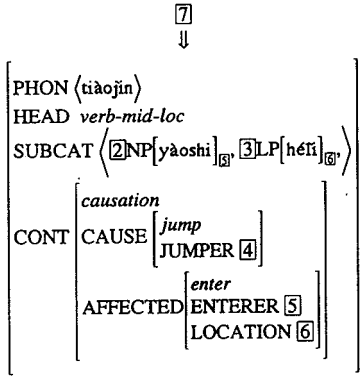


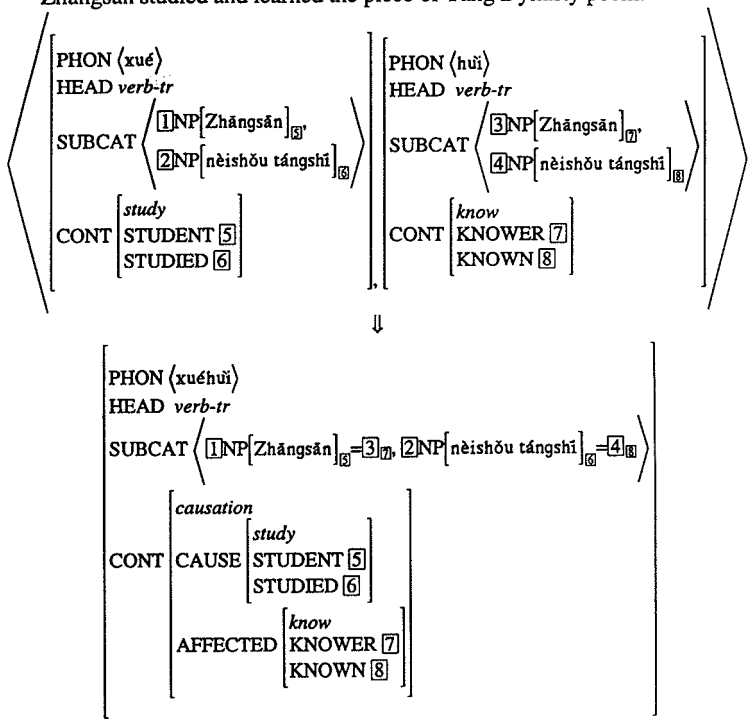
As (102a) shows, the RVC is already a transitive verb and will not undergo middle transitivization. However, the first argument of the head is not the most agent-like argument. Thus, when the agent argument suppression rule applies, we have (102b).

(102) b. Yàoshi tiàojǐng-le hé-lǐ.
key jump-enter-PER river-inside
'Someone jumped and (his) keys fell into the river.'

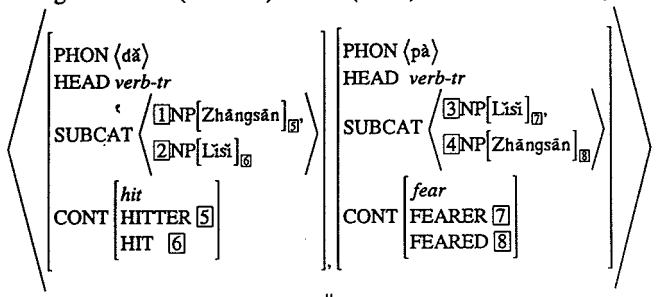


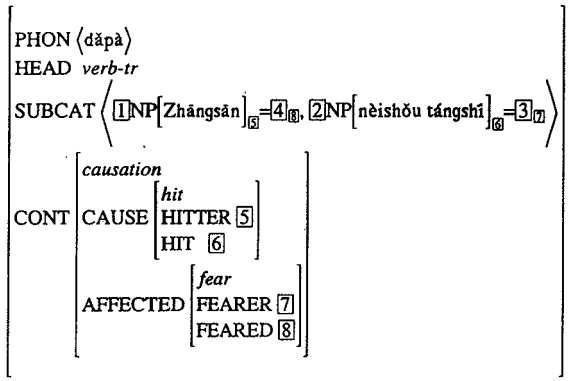
Now, let's examine cases when both components are transitives. Needless to say, the resulting RVCs must always be transitive in these cases. First, we look at left-headed compounds. Since a *bǎ*-phrase is not available when V1 is the head, a left-headed transitive RVC can only have two arguments. This gives us only two possibilities when two transitive verbs combine to form a left-headed RVC: either the two first arguments are identified and the two second arguments are also identified, or the first argument of V2 is identified with the second argument of the head and the second argument of V2 is identified with the first argument of the head. I illustrate the first possibility with ***xuéhuǐ*** 'study so as to know' in (103) and the second possibility with *dǎpà* 'hit to make afraid' in (104).

(103) Zhāngsān xuéhuǐ-le nèi-shǒu tángshī.
Zhangsan study-know-PER that-CL Tang-Dynasty-poem
Zhangsan studied and learned the piece of Tang Dynasty poem.'



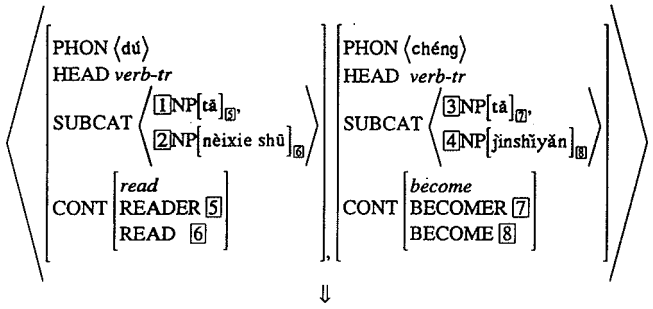
(104) Zhāngsān dǎpà-le Lǐsǐ.
Zhangsan hit-be afraid of-PER Lisi
Zhangsan hit Lisi (so much) that he (=Lisi) was afraid of him (=Zhangsan).'





As for the right-headed RVCs, we can have as many as three arguments for each verb. Thus the following possibilities are available. The first is when the two first arguments and two second arguments are identified, which will be the same as the left-headed RVC. The second possibilty is that only the first argument of V1 is identified with the first argument of the head component. The RVC is illustrated with *dúchéng* read to become' in (105) below.

(105) a. Nèi-xie shū bǎ tā dúchéng-le jǐnshǐyǎn.
that-CL book BA he read-become-PER near-see-eye
'Reading those books made him become a near-sighted person.'



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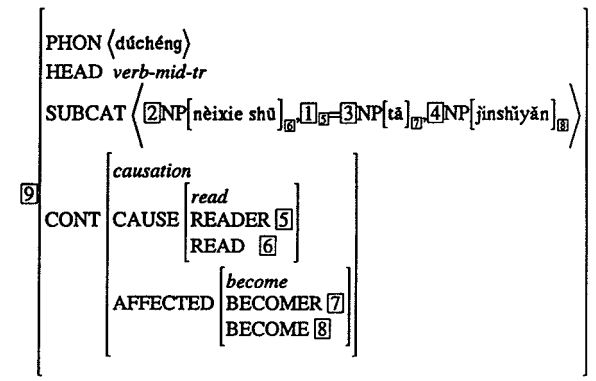

b. Tā dúchéng-le jǐnshǐyǎn.
he read-become-PER near-see-eye
'Reading something made him become a short-sighted person.'

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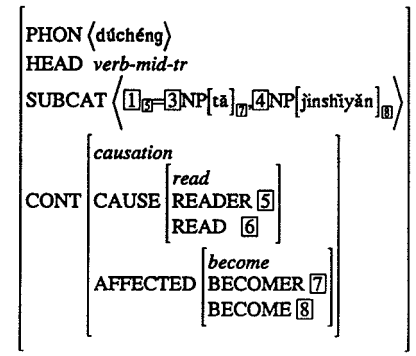
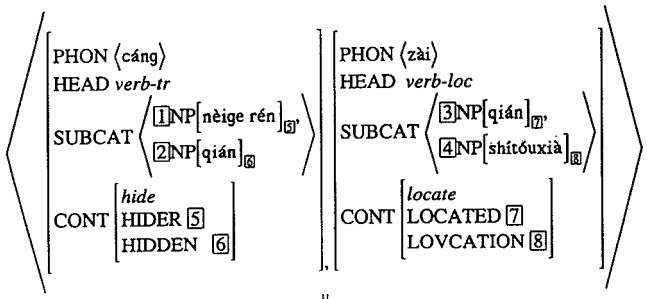


The third possibility is that only the second argument of V1 is identified with the first argument of the head. I illustrate the VCR with *cángzài* 'hide in' as (106).

(106) a. Nèi-ge rén bǎ qián cángzài shítóu-xià.
that-CL person BA money hide-at rock-under
'That man hides the money under the rock.'



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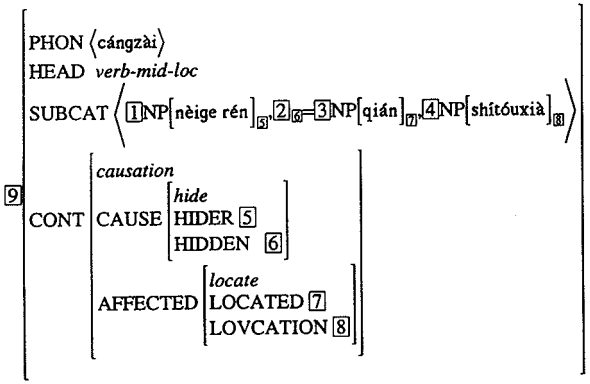

b. Qián cángzài shítóu-xià.
money hide-at rock-under
'The money was hidden under the rock.'

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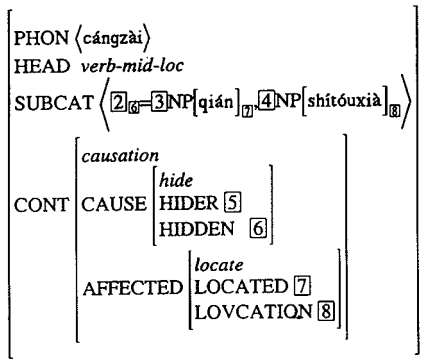
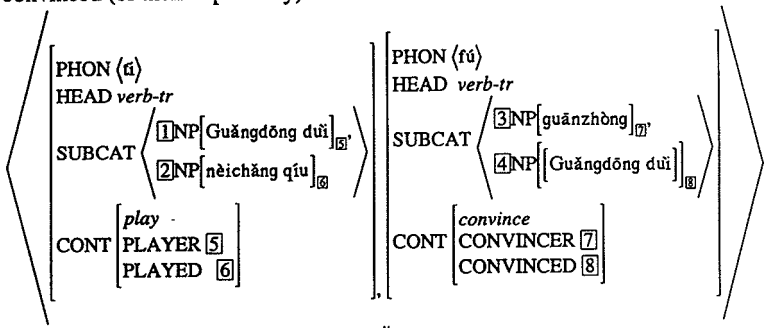


The fourth possibility is when the first argument of V1 is identified with the second head argument. This is illustrated with *tīfú* 'kick to convince' in (107) below.

(107) a. Nèi-chǎng qíu bǎ guānzhòng tīfú-le Guǎngdōng duì.
that-CL ball BA spectators kick-convinced-PER Guangdong team
'The Guangdong Soccer Team played the game (so well) that the spectators were convinced (of their superiority).'



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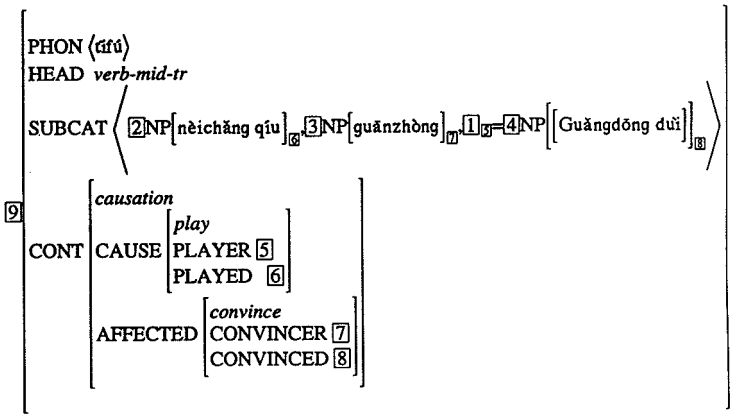
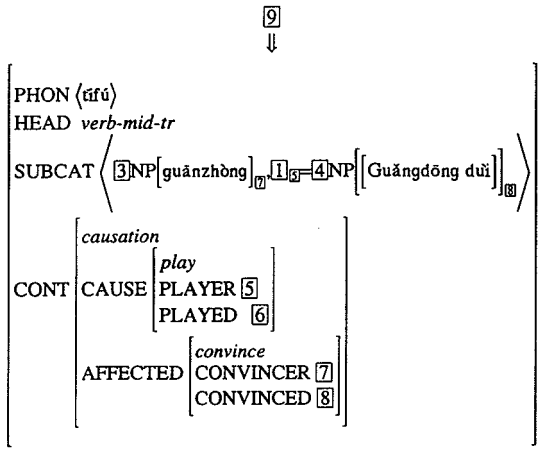
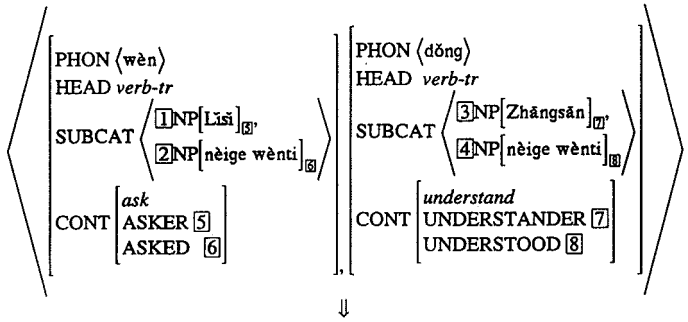


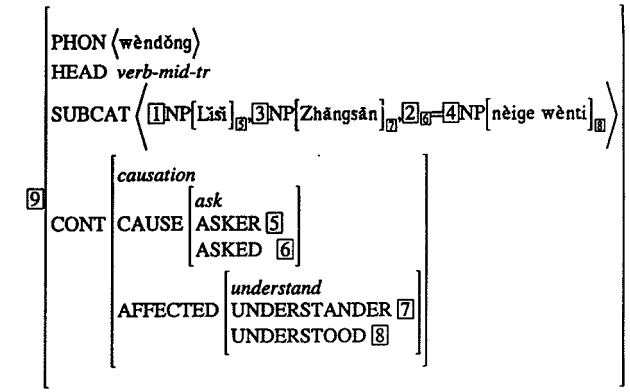
b. Guānzhòng tīfú-le Guǎngdōng duì.
spectators kick-convinced-PER Guangdong team
'The spectators were won over by the Guangdong Soccer Team (after the game).'



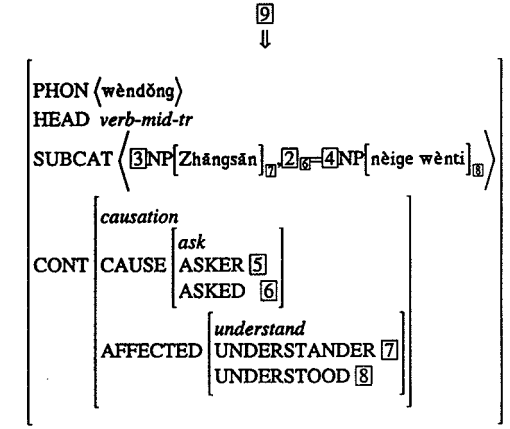
The fifth possibility is when the second argument of V1 is identified with the second head argument. The RVC is illustrated with *wèndǒng* 'ask so to make understand' in (108) below.

(108) a. Lisi bǎ Zhāngsān wèndǒng-le nèi-ge wènti.
Lisi BA Zhangsan ask-understand-PER that-CL question
'Lisi made Zhangsan understand the question by asking it.'





b. Zhāngsān wèndǒng-le nèi-ge wènti. ≠ (75)
Zhangsan ask-understand-PER that-CL question
'Zhangsan understood the question by being asked it.'



6.2.3.3 Conclusion

I have discussed two ways that a Chinese resultative verb compounds can be formed: the right-headed compound and the left-headed compound. The valence alternations, especially the alternation between the *bǎ*-marked complement and the unmarked complement, can be explained under this analysis: the *bǎ*-construction is a middle construction that is generated with right-headed RVCs. The alternation between *bǎ*- and non-bǎ-constructions can be see as that between an intransitive middle and its transitivized version. Only *bǎ*-phrases in

transitive middle verbs do not have (postverbal) non-*bǎ* alternation, as have been shown in (101)-(102) and (105)-(108).

Compared with the traditional analysis where RVCs are uniformly treated as left-headed, our two-way analysis has a lot of advantages. To make the comparison easy to see, (60) is reproduced as (109) below with the SUBCAT list corresponding to each reading, where V1 *zhuī* 'chase' is transitive and has two arguments denoted as [1] and [2], and V2 *lèi* 'be tired' is intransitive and has only one argument denoted as [3].

(109) a. Zhāngsān zhuīlèi-le Lǐsǐ.
Zhangsan chase-tired-PER Lisi

b. 'Zhangsan chased Lisi and got himself (=Zhangsan) tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT} \left\langle [1]\text{NP}[\text{Zhāngsān}]=[3],\ [2]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

c. 'Zhangsan chased Lisi and got him (=Lisi) tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT} \left\langle [1]\text{NP}[\text{Zhāngsān}],\ [2]\text{NP}[\text{Lǐsǐ}]=[3] \right\rangle \end{bmatrix}$$

d. 'Chasing Zhangsan made Lisi tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT} \left\langle [2]\text{NP}[\text{Zhāngsān}],\ [1]=[3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

e. 'Zhangsan chased (someone) and got Lisi tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-tr} \\ \text{SUBCAT} \left\langle [1]\text{NP}[\text{Zhāngsān}],\ [3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

f. Zhāngsān bǎ Lǐsǐ zhuīlèi-le.
Zhangsan BA Lisi chase-tired-PER

g. 'Zhangsan chased Lisi and got him tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT} \left\langle [1]\text{NP}[\text{Zhāngsān}],\ [2]=[3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

h. 'Chasing Zhangsan made Lisi tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT} \left\langle [2]\text{NP}[\text{Zhāngsān}],\ [1]=[3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

i. 'Zhangsan chased (someone) and got Lisi tired.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT} \left\langle [1]\text{NP}[\text{Zhāngsān}],\ [3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

j. Lǐsǐ zhuīlèi-le.
Lisi chase-tired-PER

k. 'Lisi was tired after being chased.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT} \left\langle [2]=[3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

l. 'Lisi was tired after chasing someone.'

$$\begin{bmatrix} \text{PHON} \langle \text{zhuīlèi} \rangle \\ \text{HEAD } \textit{verb-mid-intr} \\ \text{SUBCAT} \left\langle [1]=[3]\text{NP}[\text{Lǐsǐ}] \right\rangle \end{bmatrix}$$

First, it is much easier to predict the transitivity of the RVCs than in the traditional analysis (Li 1990, Ross 1990, Chang 1989), where the transitivity of the component verbs does not make any contribution to the transitivity of the RVCs. As we can see from the above examples, even though V1 is transitive, the RVCs can be transitive in (109b-e) as well as intransitive (109f-l). However, in our two-way analysis, only (109b-c) are produced as left-handed lexemes and they are transitive RVCs, and (109g-i) are produced as right-headed lexemes and they are intransitives. (109d-e) are produced through the middle transitivization rule and (109k-l) are produced from the middle agent argument suppression rule.

Second, in the two-way analysis we can clearly see how the *bǎ*-phrase is produced. In the traditional analysis, however, this is not so clear, because any argument of V1 may or may not be a *bǎ*-phrase: In (109g) it is the second argument and in (109h) it is the first argument, but in (109i) it is an argument of V2, not V1, that becomes the *bǎ*-phrase. In the two-way analysis proposed in this thesis, we can see that *bǎ*-phrase is always the first argument of V2 in a right-headed RVC. For instance, the *bǎ*-phrase is always the argument [3] in (109g-i).

Third, with the two-way analysis, it is now much easy to predict when the formation of a middle verb with a *bǎ*-phrase is possible: when the first argument of V2 is not the most agent-like on the SUBCAT list of the RVC.

The two way analysis does not only have advantages, it is also warranted in the sense that the traditional analysis cannot explain the multi-way ambiguity of a RVC sentence. Take (109a) for example. According to previous analyses, the sentence can only be two ways ambiguous: either the argument of V2 is coindexed with/matches the first argument of V1 to get (109b) or it is coindexed with/matches the second argument of V1 to get (109c). No analysis has ever explained how we can get the reading in (109d), although Li (1990) suggested that repeating V1 to mark its second argument is a way to produce a similar sentence to (109e). The reason why traditional analyses fail to explain (109d) is not only that they are out of options in argument percolation but also because in all the analyses a general assumption is held that the argument structure of the head must be respected throughout the compounding process. However, in (109d) we see that the argument order of V1 is reversed and this is not allowed in previous analyses. In my two-way analysis, this is no longer a problem because (109d) is generated with V2 as the head, not V1. I still hold the assumption that the argument structure of the head must be respected. However, since in (109d), V1 is no longer the head of the RVC, reversal of its argument structure does not violate this assumption, just as the argument structure of V2 can be reversed in (104) when V1 is the head. Indeed, not only may the argument structure of V1 be rearranged, all its arguments may be lexically absent, as is the case of (96c), where the only lexically realized argument of the RVC comes from V2. Thus, treating V2 as the head can predict these sentences without undermining the basic assumptions about Chinese compounding.

The two-way analysis also clearly predicts which verbs lack postverbal non-*bǎ* alternations. These are the transitive middle verbs shown earlier as (52)-(53).

6.3. Consequences

We have seen that *bǎ*-marked complements are produced as a result of right-headed compounding. Two verbs can be compounded if there is some kind of connection between the events denoted by the two verbs. In most cases, this connection is realized via argument identification. In the above analysis, the *bǎ*-marked complements have been pin-pointed to the first argument of the second verb in a right-headed compound when it is not the most agent-like argument on the SUBCAT list of the RVC. This analysis can explain why some sentences like (51) do not have a *bǎ*-phrase alternation. This is because the first argument

of *zuì* 'be drunk' is required to be animate and therefore cannot be identified with the second argument of the first verb *hē* 'drink' that is required to be non-animate liquid. We repeat (51) below.

(51) a. **Zhāngsān hēzuì-le jiǔ.**
Zhangsan drink-drunk-PER wine
'Zhangsan is drunk (after drinking wine).'

b. ***Zhāngsān bǎ jiǔ hēzuì-le.**
Zhangsan BA wine drink-drunk-PER

Other non-alternations like (52) and (53), repeated below, can also be explained: these sentences are projected by the transitive middle verbs, which, according to the non-involvement constraint, do not allow their object to be involved with any lexical rules.

(52) a. **Zhāngsān bǎ yǐzi shuàiduàn-le tuǐ.**
Zhangsan BA chair throw-break-PER leg
'Zhangsan has broken the chair's legs (after throwing it).'

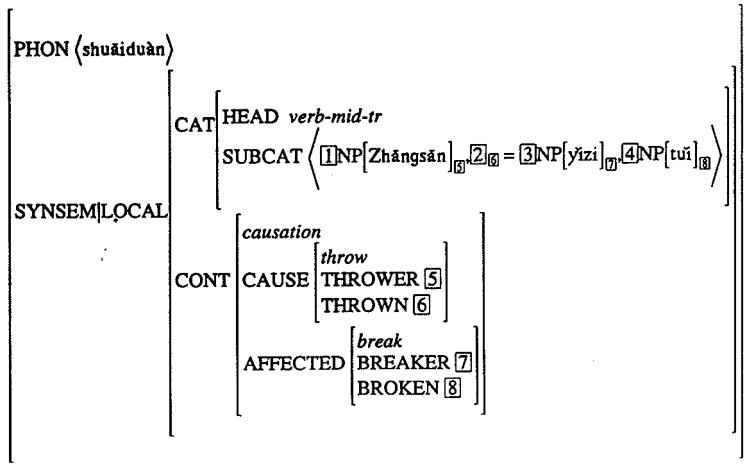
b. ***Zhāngsān bǎ yǐzi bǎ tuǐ shuāiduàn-le.**
Zhangsan BA chair BA leg throw-break-PER

(53) a. **Zhāngsān bǎ xíngli fàngzài-le chē-shàng.**
Zhangsan BA luggage place-at-PER bus-top
'Zhangsan has put the luggage on the bus.'

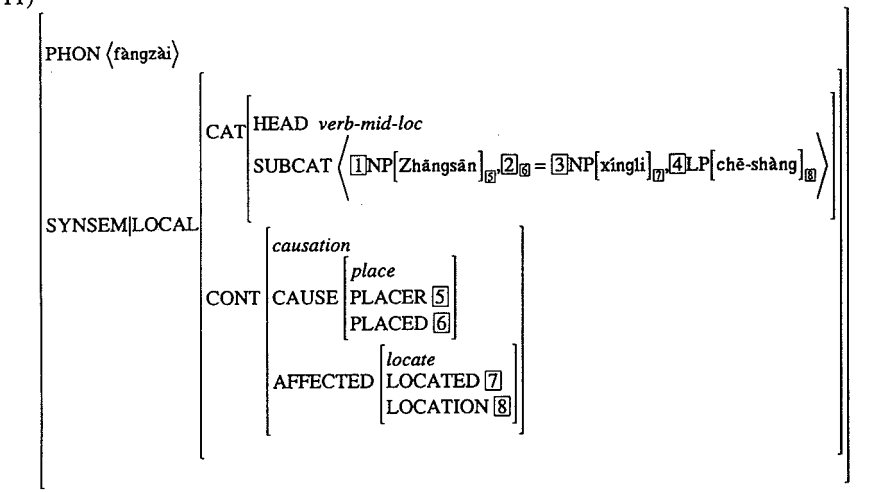
b. ***Zhāngsān bǎ xíngli zài chē-shàng fàngzài-le.**
Zhangsan BA luggage ZAI bus-top place-at-PER

According to the compounding rules, (52a) and (53a) are produced by right-headed compounding and the lexical entries are given as (110) and (111) respectively.

(110)



(111)



The unacceptability of the (b) sentences in the above examples has been attributed to violation of haplology (Chao 1968, Shi 1987, Li 1990). But my explanation is that our analysis of compounding simply does not produce structures like the (b) sentences. However, I want more from the middle transitive verbs, especially their unmarked complements.

Recall that a middle transitive verb is produced with a right-headed RVC with a transitive head whose argument structure must be respected according to TAP. Respecting the argument structure not only means that the order of the arguments be observed but also that all the arguments themselves be kept (obligatory). The fact that the ummarked complement of a middle transitive verb comes from the second argument of the head component not only makes the argument obligatory, but also freezes it to the postverbal position and no lexical rules will ever involve it. To account for this phenomenon, I state the non-involvement constraint as (112) below.

(112)The Non-Involvement Constraint

No lexical or syntactic rules will involve an unmarked complement of a middle transitive verb.

In the next two subsections, we will look at the consequences this constraint has on Chinese syntax.

6.3.1. Relativization

Recall that in Chapter Four, we showed that K&C's NP Accessibility Hierarchy (AH) does not work for Chinese because in Chinese the objects seem to be the elements most reluctant to undergo relativization. Here we want to account for this unrelativizability of some objects by claiming that the objects that resist relativization are those of middle transitive verbs.

When I claim that the object NP/LP's are the most reluctant elements of the sentence to undergo relativization, we do not mean that no object NP/LP's can be relativized. Actually, for an ordinary transitive sentence in Chinese, it is not difficult to relativize the object. Examine the following.

(113) a. Zhāngsān xǐhuān chī shuíguǒ.
Zhangsan like eat fruit
'Zhangsan likes to eat fruit.'

b. Zhāngsān xǐhuān chī de shuíguǒ hěn duō.
Zhangsan like eat DE fruit very many
'The fruit that Zhangsan likes to eat is of many kinds.'

(114) a. Gēlúnbù fāxiàn-le xīn dàlù.
Columbus discover-PER new big-land
'Columbus discovered the New World.'

b. Gēlúnbù fāxiàn de xīn dàlù shì běi měizhōu.
Columbus discover DE new big-land is north America
'The new land that Columbus discovered is North America.'

However, when the sentence has a *bǎ*-phrase, then the object is no longer available for relativization. This is shown with examples at the beginning of Chapter Four, repeated here as (115) and (116).

(115) a. Zhāngsān bǎ júzi bō-le pí.
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the orange off its skin.'

b. *Zhāngsān bǎ júzi bō-le de pí.
Zhangsan BA orange peel-PER DE skin
Intended: 'the skin that Zhangsan peeled off the orange'

c. bǎ júzi bō-le pí de Zhāngsān
BA orange peel-PER skin DE Zhangsan
'Zhangsan who has peeled the skin off the orange'

d. Zhāngsān bō-le pí de júzi
Zhangsan peel-PER skin DE orange
'the orange that Zhangsan has peeled the skin off '

(116) a. Zhāngsān bǎ qiānbǐ fàngjìn-le shūbāo.
Zhangsan BA pencil put-into-PER bookbag
'Zhangsan has put the pencil into the bookbag.'

b. *Zhāngsān bǎ qiānbǐ fàngjìn-le de shūbāo.
Zhangsan BA pencil put-into-PER DE bookbag
Intended: 'the bookbag into which Zhangsan has put the pencil'

c. bǎ qiānbǐ fàngjìn-le shūbāo de Zhāngsān
BA pencil put-into-PER bookbag DE Zhangsan
'Zhangsan, who has put the pencil into the bookbag.'

d. Zhāngsān fàngjìn-le shūbāo de qiānbǐ
Zhangsan put-into-PER bookbag DE pencil
'the pencil that Zhangsan has put into the bookbag.'

In (115) and (116), we have seen that all the NP's except the object can be relativized. And both sets of sentences have *bǎ*-marked complements. I have shown that the *bǎ*-marked complement is generally the result of a right-headed compounding and the object of a right-headed compound verb is generally the result of a transitive V2. Thus we understand that the objects in (115) and (116) of middle transitive RVCs. Therefore the unacceptability of (115b) and (116b) are accounted for by (112). This analysis also predicts that the objects in (52) and (53) cannot be relativized because those objects are all of middle transitive verbs, as is shown in their lexical entries in (110) and (111). This prediction is borne out. We repeat (52) and (53) as (117) and (118) respectively.

(117) a. Zhāngsān bǎ yǐzi shuàiduàn-le tuǐ. (= 52)
Zhangsan BA chair throw-break-PER leg
'Zhangsan has broken the chair's legs (after throwing it).'

b. *Zhāngsān bǎ yǐzi shuāiduàn-le de tuǐ.
Zhangsan BA chair throw-break-PER DE leg
Intended: 'the leg that Zhangsan has broken off the chair'

(118) a. Zhāngsān bǎ xíngli fàngzài-le chē-shàng. (= 53)
Zhangsan BA luggage place-at-PER bus-top
'Zhangsan has put the luggage on the bus.'

b. *Zhāngsān bǎ xíngli fàngzài-le de chē-shàng .
Zhangsan BA luggage place-at-PER DE bus-top
Intended: 'On the bus where Zhangsan has put the luggage'

6.3.2. Topicalization

It is not only the unmarked arguments of middle transitive RVCs that cannot be relativized. We also notice that exactly the same arguments cannot undergo topicalization. I use the same examples to show this.

(113) c. Shuíguǒ, Zhāngsān xǐhuān chī.
fruit Zhangsan like eat
'Fruit Zhangsan likes to eat.'

(114) c. Xīn dàlù, Gēlúnbù fāxiàn-le.
new big-land Columbus discover-PER
'The New World is what Columbus discovered.'

(115) e. *Pí, Zhāngsān bǎ júzi bō-le
skin Zhangsan BA orange peel-PER
Intended: '*Its skin, Zhangsan has peeled the orange off .'

(116) e. *Shūbāo, Zhāngsān bǎ qiānbǐ fàngjìn-le .
bookbag Zhangsan BA pencil put-into-PER
Intended: 'It is into the bookbag that Zhangsan has put the pencil.'

(117) c. *Tuǐ, Zhāngsān bǎ yǐzi shuàiduàn-le.
leg Zhangsan BA chair throw-break-PER
Intended: 'It is the legs that Zhangsan has broken off the chair (after throwing it).'

(118) c. *Chē-shàng, Zhāngsān bǎ xíngli fàngzài-le.
bus-top Zhangsan BA luggage place-at-PER
Intended: 'It is on the bus that Zhangsan has put the luggage.'

In (113c) and (114c), the main verbs are not middle transitive verbs and therefore topicalization is possible in these sentences. However, in (115e) to (118c) above, the verbs are middle transitive RVCs. Thus (112) correctly predicts the untopicalizability of the unmarked complements in these sentences..

6.4. Conclusion

In this chapter, we have examined the phrase structure of Chinese sentences with a special focus on the valence alternation of RVCs. It is our belief that the disappearance of prepositions and emergence of markers is a direct result of contact with other SOV languages. This change has provided Chinese phrase structure with the option of preverbal complements. Thus some Chinese verbs can have the same argument placed either preverbally as a marked complement (such verbs are defined in the thesis as the intransitives), or postverbally as an unmarked complement known as the object, hence the transitive use the verbs. The valence alternation is now explained under the transitivity theory of verbs. There are three different transitivization operations: ergative transitivization that changes the predication of the ergative verbs, unergative transitivization that may or may not change the predication of the ungative verbs, and middle transitivization, which

does not change the predication of the middle intransitive verbs. We have proposed two different ways an RVC can be formed that result in different argument concatenations. In this analysis, we are able to pin-point a set of verbs, known as middle transitive verbs, whose unmarked complements are frozen to the postverbal position, thereby disallowing relativization or topicalization.

Chapter 7

RESULTATIVE STRUCTURES

7.0. Introduction

In the last chapter I have shown that Chinese grammar allows a variety of valence alternations and lexical rules will accomodate these changes. However, the alternations do not take place across a clause boundary. That is, the phrase structure only makes clause-internal adjustments when changes arise in the argument structure. Thus the alternation in (1) can be expected but not the one in (2).

(1) a. Zhāngsan dǎshāng-le Lǐsǐ.
Zhangsan hit-wound-PER Lisi
'Zhangsan has wounded Lisi (by hitting him).

b. Zhāngsan bǎ Lǐsǐ dǎshāng-le.
Zhangsan BA Lisi hit-wound-PER
'Zhangsan has wounded Lisi (by hitting him).

(2) a. Zhāngsan zhīdào [Lǐsǐ qù-le Měiguó]$_S$.
Zhangsan know Lisi go-PER US
'Zhangsan know that Lisi has gone to the United States'.

b. *Zhāngsan bǎ Lǐsǐ zhīdào qù-le Měiguó.
Zhangsan BA Lisi know go-PER US

The reason why (2b) is unacceptable is because Lisi is not an argument of the matrix clause verb *zhīdào* 'know'. It belongs to the embedded clause verb *qù-le* 'have gone'. Therefore mixing arguments between the matrix clause and the embedded clause is not allowed. However, the following examples seem to serve as counterexamples to this observation.

(3) a. Zhāngsan qǐ-de Lǐsǐ líkai-le xuéxiào.
Zhangsan angry-DE Lisi leave-PER school
'Zhangsan made Lisi so angry that he left school.'

b. Zhāngsan bǎ Lǐsǐ qǐ-de líkai-le xuéxiào.
Zhangsan BA Lisi angry-DE leave-PER school
'Zhangsan made Lisi so angry that he left school.'

(4) a. Nèi-tou dàxiàng xià-de Lǐsǐ liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant scare-DE Lisi two-CL leg continuously shake
'That elephant made Lisi so scared that his two legs could not stop shaking.'

b. Nèi-tou dàxiàng bǎ Lǐsǐ xià-de liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant BA Lisi scare-DE two-CL leg continuously shake
'That elephent made Lisi so scared that his two legs could not stop shaking.'

The traditional analysis of the sentences in (3a) and (4a) is to treat the part after the matrix verb as a resultative clause (Gao 1991, Goodall 1987, Li 1985). That is, Lisi in both cases is considered to be the subject of the embedded clause. If this is so, then we face a difficult task explaining why some embedded subjects can alternate with the matrix complements while others cannot.

In this chapter, I take up the resultative construction and re-examine previous analyses. I show that the embedded clause analysis is not correct. Instead, I show that the resultative construction is licensed by a verb with the suffix *de* which requires not a resultative clause, but an NP object and an (object controlled) VP in (3a) or an S in (4a). Under this analysis, the sentences in (3b) and (4b) do not pose any difficulties

This Chapter is organized as follows. In Section 7.1, I re-examine previous proposals and point out the problems with some of the arguments. In Section 7.2, I propose that resultative part that was claimed to be a clause is actually an NP and a VP or an NP and an S. Evidence will be cited to support this anaysis. In conclusion, I show that the proposed analysis compares favorably with other possible proposals.

7.1 The Background

Resultative constructions and sentences with resultative verb compounds have much in common. As can be seen from the above examples in (1) and (3), both allow valence alternation with *bǎ*. Both of the structures describe some action and the result of the action. Differences also exist. Semantically, the resultative construction carries a meaning element of 'do something to so great an extent that ...' which the resultative verb compounds lack. The syntactic difference seems to be that in (1) the action and the result are expressed as a unit by the resultative verb compound and in (3) the action is expressed in the matrix clause and the result in the embedded clause. It is not surprising that the resultative verb compound has been suggested to be a miniature of the resultative construction (Hashimoto 1964). Since the focus of this chapter is on valence alternation and both structures involve the *bǎ* and non-*bǎ* alternation, I will make frequent references to the RVC construction in the sections to come.

7.1.1. The RVC and the Resultative Structure

All previous analyses have one thing in common. That is, they all agree that *bǎ*-phrase is always closely linked to accomplishment verbs (Smith 1991). This is because, as Gao

(1993) argues, the preverbal *bǎ*-phrase is possible only when the verb denotes an action with a result and the verbs used in such structures are resultative verb compounds (RVCs). Generally speaking, an RVC can be analyzed as having two components with the first part denoting an action and the second part, the result or the accomplishment of the action. The two components of the RVC are free verb morphemes and the relation of the valency between each component and the compound as a whole becomes the focus of the study when it is observed that not all RVCs allow the alternation between the postverbal object and the preverbal *bǎ*-phrase, as is shown in the following examples.

(5) a. Zhāngsān chī-wán-le fàn.
Zhangsan eat-finish-PER meal.
'Zhangsan has finished his meal.'

b. Zhāngsān bǎ fàn chī-wán-le.
Zhangsan BA meal eat-finish-PER
'Zhangsan has finished his meal.'

(6) a. Zhāngsān chī-bǎo-le fàn.
Zhangsan eat-full-PER meal
'Zhangsan is full (from eating his meal).'

b. *Zhāngsān bǎ fàn chī-bǎo-le.
Zhangsan BA meal eat-full-PER

Different lexical approaches to explain this phenomenon have been discussed in detail in the previous chapters and these analyses have in many ways influenced the analysis of the double-clause resultative structures mentioned at the begining of this chapter. And in fact we can see that the RVCs resemble miniatures of the resultative structures in the following.

(7) a. Zhāngsān dou kū-shī-le shǒupà.
Zhangsan DOU cry-wet-PER handkerchief
'Zhangsan cried and even soaked the handkerchief (with his tears).'

b. Zhāngsān bǎ shǒupà dou kū-shī-le
Zhangsan BA handkerchief DOU cry-wet-PER
'Zhangsan cried and even soaked the handkerchief (with his tears).'

(8) a. Zhāngsān kū-de shǒupà dōu shī-le.
Zhangsan cry-DE handkerchief DOU wet-PER
'Zhangsan cried (so much) that even the handkerchief got soaked (with his tears).'

b. Zhāngsān bǎ shǒupà kū-de dōu shī-le.
Zhangsan BA handkerchief cry-DE DOU wet-PER
'Zhangsan cried (so much) that even the handkerchief got soaked (with his tears).'

Thus we can see that (8a) appears to be an unreduced version of (7a), in that the two verbs *kū* 'cry' and *shī* 'wet' are separated in two different clauses in (11a) while the same two verbs are lexicalized into an RVC in (7a). Likewise, the *bǎ*-construction with an RVC in (7b) apparently can be expanded into a two-clause resultative structure with a *bǎ*-phrase in

(8b). It is exactly this resemblance of the two that motivates syntactic analyses of RVCs and resultative structures as having the same underlying two-clause structures. We will examine some of those approaches in the next section.

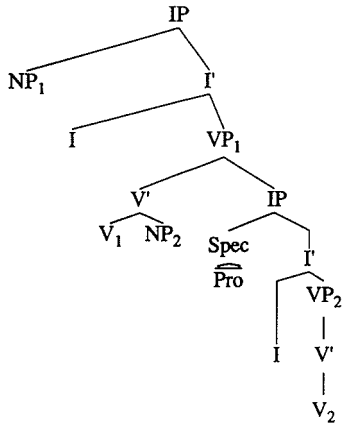
7.1.2. Previous Analyses

The syntactic analysis of resultative structures is usually linked to the analysis of the RVC sentences since historically the RVCs were once distinct verbs with an object NP in between. This word order can even been seen nowadays in some southern dialects of Chinese. Thus it is no surprise that some linguists approach the resultative structure by starting with an RVC analysis.

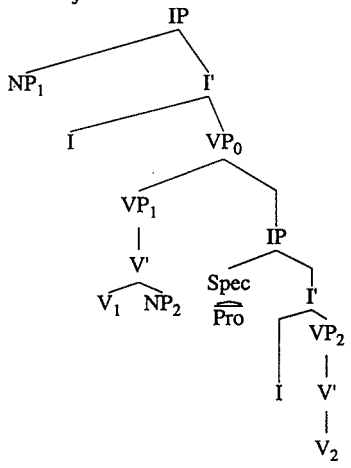
7.1.2.1. Gao's Analysis

A representative work of the analysis linking RVCs with resultative structures can be found in Gao (1995). This paper is intended to explain the availability of *bǎ*-constructions with RVCs from a purely syntactical angle. In this analysis, the notions subject control and object control are argued to be structural properties rather than lexical properties. Since only object-controlled constructions such as (5) are available for the *bǎ*-construction, they are assigned different underlying structures than subject-controlled sentences such as (6). This is illustrated as follows.

(9) a. Object-control structure



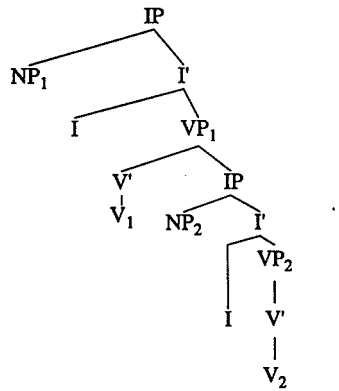
b. Subject-control structure



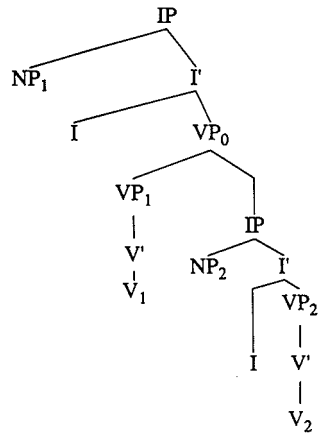
The distinct structures ensure that NP_2 is the first m-commanding[1] NP for the Pro,[2] not NP_1, in a object-controlled structure in (9a), while only NP_1 can m-command the Pro in the subject-controlled structure in (9b). Assuming with Lee (1976) that there is a conspiracy in contemporary Chinese to impose a morphophonological requirement of polysyllabicity, then there are two ways that V_2 and V_1 can be phonologically adjacent to each other: move V_2 to join V_1 via Head-Movement so that we have sentences like those in (5a) and (6a). Or we can simply move NP_2 to a preverbal position so that we have sentences like those in (5b) and (6b); in this case (6b) is unacceptable because it has violated semantic coherence when NP_2 is moved to a position that can m-command the Pro.

This analysis also applies to (7), where V_1 is intransitive and the position for the Pro now has to be filled with a lexical item, as is shown in (10). Thus subject-control or object-control is no longer the issue but the result is still correct: moving V_2 to join V_1 yields (7a) and moving NP_2 to a preverbal position yields (7b). Both are acceptable.

(10) a.



b.



However, questions remain. Although control no longer exists for (7), the distinct structures are still available. If we use both, then we permit spurious ambiguity for (7). If we are to choose one, then which should we choose and why?

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1 α m-commands β iff the minimal maximal category dominating α dominates β.

2 Assume with Huang 1987 that Pro is like a PRO but in a Case position.

What is relevant for present purposes is that this analysis is used, without further argument, for the resultative structures of (8). That is, in the resultative structure the postverbal part is treated as a full clause with NP_2 as the subject. And because of structures like this, it is claimed that the function of *bǎ* is not only to take an object NP and put it in a preverbal position, but to take any postverbal NP and put it in a preverbal position.

However, the analogy falls short on several issues. First, the resultative structure is always characterized by the use of *de* at the end of the matrix verb and this *de* is always missing in sentences with RVCs. If we take this *de* to be the complementizer of the embedded clause, it could explain why Head-Movement is blocked: *de* is the head of the embedded clause and the lower verb can not cross it when it moves to join the matrix verb. But even in this case, there is still no explanation why no (postverbal) object can be ever found in the matrix clause even if the the matrix verb is transitive.

(11) a. Zhāngsān chī de hěn bǎo.
Zhangsan eat DE very full
'Zhangsan is very full after eating (his meal).'

b. *Zhāngsān chī fàn de hěn bǎo.
Zhangsan eat meal DE very full
Intended: 'Zhangsan is very full after eating (his meal).'

c. *Zhāngsān bǎ fàn chī de hěn bǎo.
Zhangsan BA meal eat DE very full
Intended: 'Zhangsan is very full after eating (his meal).'

(12) a. Zhāngsān bǎ dìbǎn tuō de hěn gānjìng.
Zhangsan BA floor sweep DE very clean.
'Zhangsan has swept the floor very clean.'

b. *Zhāngsān tuō dìbǎn de hěn gānjìng.
Zhangsan sweep floor DE very clean.
Intended: 'Zhangsan has swept the floor very clean.'

c. Zhāngsān tuō de dìbǎn hěn gānjìng.
Zhangsan sweep DE floor very clean.
'Zhangsan has swept the floor very clean.'

We can see that (11a) must be a subject-controlled structure because adding a fronted *bǎ*-phrase makes it unacceptable. This is similar to explaining examples in (6) with the structure of (9b). However, even structure (9b) can not explain why (11b) is unacceptable where the object NP is not in any position to m-command the Pro in the embedded subject position. The examples in (12) resemble the object-controlled RVC sentences. But adding *de* not only blocks V_2 from moving up to join V_1, it also blocks the object NP from taking the postverbal object position in (12b). However, it is this very object that becomes the embedded subject in (12c). Thus the suggested object-controlled structure is no longer

available to explain (12). But is it possible that the NP after *de* is not the embedded subject but the matrix object? Gao (1995) simply did not make any attempt to explain this.

Thus, we seem to have a word *de* whose function is more than just a complementizer.

7.1.2.2. Goodall (1989)'s Arguments

Following Wang (1957) and Wang (1970), Goodall also argues for a small clause analysis of the postverbal resultative structure. Goodall notes that expressions such as ***tiěshù kāi huā*** 'The iron trees blossom' and ***kūzhī fā yá*** 'The dead branches germinate' are sentential idioms in Chinese. They are generally used to mean that some very unusual things happen. In the following examples,[3] these idiom chunks are used in resultative structures

(13) a. **Zhāngsān kū de tiěshù kāi-le huā.**
Zhangsan cry DE iron-tree open-PER flower
'Zhangsan cried (so much) that something very unusual happened.'

b. **Zhāngsān bǎ tiěshù kū de kāi-le huā.**
Zhangsan BA iron-tree cry DE open-PER flower
'Zhangsan cried (so much) that something very unusual happened.'

Goodall argues that since ***tiěshù kāi-le huā*** 'the iron trees have blossomed' is a sentential idiom chunk, it must be the case that the NP ***tiěshù*** 'the iron tree' is base generated in the subject position of the embedded clause in (13a). Then this embedded subject is raised to the preverbal position in the matrix clause in (13b). Thus the function of *bǎ* is not only to take an object NP and put it in the preverbal position, but also to take any postverbal NP and put it in the postverbal position.

However, as Huang (1991) points out, the translation in (13) is problematic. He observes that in (13b) the NP ***tiěshù*** 'the iron tree' does not have the idiomatic reading. Rather, it becomes fully referential. Thus the correct translation of (13b) should be 'Zhangsan cried so much that even the iron trees blossomed'. If this is true, then (13b) cannot possibly come from (13a), for transformational rules are meaning-preserving and there should be no meaning change before and after the transformation. However, we find that (13a) is ambiguous. That is, the NP ***tiěshù*** can also have a referential reading. Thus the

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[3] A related sentence is shown in (i).

(i) Tiěshù kū de kāi-le huā.
iron-tree cry DE open-PER flower
a. 'Someone cried so much that the iron tree bloomed.'
b. 'The iron tree cried so much that it burst into bloom.'
c. '*Someone cried so much that something very unusual happened.'

The ambiguity of the (i) can be explained by two different lexical entries similar to (45c) and (45d). The unavailability of the idiomatic interpretation in (ic) shows that ***kūde*** is not a raising verb.

fact that (16a) is ambiguous between a referential reading and an idiomatic reading shows that small clause is not the only analysis of the postverbal resultative structure.

7.1.2.3. Li (1985)'s arguments for clausehood analysis

Li (1985) has also considered the analysis of resultative structures. Following Travis (1984)'s directionality analysis of Chinese verbs, Li claims that Chinese phrase structure is always head-final except for Case-receiving elements. That is, in a sentential structure, no other elements but NPs or clauses can stay postverbally if they are subcategorized for by the verb. This is due to the fact that in Chinese both NPs and Clauses are subject to the Case Filter and Chinese verbs only assign Case to the right. Following Mei (1972), Li distinguishes descriptive structures like those in (14) from resultative structures in (15).

(14) a. Zhāngsān pǎo-de hěn kuài.
Zhangsan run-DE very fast
'Zhangsan runs very fast.'

b. Tā lái-de hěn tūrán.
he come-DE very sudden
'He comes suddenly.'

(15) a. Zhāngsān pǎo-de (rén) hěn lèi.
Zhangsan run-DE man very tired
'Zhangsan got tired from running.'

b. Tā qǐ-de (Lǐsǐ) zhí duò jiǎo.
he angry-DE Lisi continously stamp foot
'He stamps his foot /(makes Lisi stamps his foot) with anger.'

Li claims that the descriptive structures in (14) are APs while the resultative structures in (15) are clauses. With other arguments Li claims that the APs in the descriptive structures are actually the main predicates and therefore the strictly head final analysis holds for Chinese. As for the resultative structure, since a lexical NP is always a possibility between the resultative predicate and the main verb (the verb suffixed with *de*), Li favors a clause analysis because a clause needs a Case and therefore can stay postverbally. The two different structures are shown bellow.

(16) a. a descriptive structure: $[NP_1\ X\ [V\text{-}de\ [AP]_{VP}]_{VP}]_S$

b. a resultative structure: $[NP_1\ X\ [V_1\text{-}de\ [NP_2\ VP_2]_S]_{VP}]_S$

I must point out that the clause analysis of the resultative structure is forced on Li because of her theoretic framework. Her analysis is based on very limited evidence with very shaky examples. For instance, she argues that the resultative structure is a clause, not a VP, because it is always possible to fill the embedded subject position with a lexical NP. The examples in (15) are given as evidence for the argument. However, I find it very hard to accept her interpretation of (15a) with *rén* referring to *Zhāngsān*. She argues that the word

rén 'man' in the embedded subject position must be interpreted as co-indexed with the matrix subject for the sentence to be acceptable. I find the explanation very odd. This is because according to her explanation, we must accept *rén* in Chinese as an anaphoric expression and Li (1985) does not provide any evidence for this. Besides, there are other possibilities for a lexical expression in the embedded subject position to be coindexed with the matrix subject. One of these possibilities is to use a pronoun *tā* 'he' which, with the property of disjoint reference within the same clause according to Binding Principle C, can be bound by the matrix subject. However, I find replacing *rén* with *tā* in (15a) only makes it totally unacceptable on the coindexed reading. Compare the following.

(17) a. Zhāngsān$_i$ shuō tā$_{i/j}$ hěn lèi.
Zhangsan say he very tired
'Zhangsan says he is very tired.'

b. Zhāngsān$_i$ pǎo-de tā$_{*i/j}$ hěn lèi.
Zhangsan run-DE he very tired
'Zhangsan got someone else tired from running.'

Thus (17a) shows that a pronoun in the embedded subject position can be accidentally bound by the matrix subject. The fact that the same pronoun has disjoint reference from the the matrix subject in (17b) suggests that the pronoun is not in the embedded subject position. However, it is not my intention to deny the clause status of the resultative structure altogether. In fact I do believe that in some cases the postverbal resultative structure can be treated as a clause. Examine the following.

(18) a. Zhāngsān xià-de húnshēn fādǒu.
Zhangsan scare-DE all-body shake
'Zhangsan is so scared that his whole body is trembling.'

b. *Zhāngsān bǎ húnshēn xià-de fādǒu.
Zhangsan BA all-body scare-DE shake

I suggest that *húnshēn fādǒu* 'whole body trembles' should be treated as an embedded clause. For one thing, it behaves just like the embedded clause in (2) where the subject refuses to participate in the alternation between postverbal position and preverbal position with *bǎ*. However, it is the following sentence that I believe put Li's anaysis in jeopardy.

(19) a. Zhāngsān xià-de Lǐsǐ húnshēn fādǒu.
Zhangsan scare-DE Lisi all-body shake
'Zhangsan got Lisi so scared that his whole body is trembling.'

b. Zhāngsān bǎ Lǐsǐ xià-de húnshēn fādǒu.
Zhangsan BA Lisi scare-DE all-body shake
'Zhangsan got Lisi so scared that his whole body is trembling.'

Here in (19a) we see that there is an extra NP before the embedded clause compared to (18a) and this NP does not behave like the embedded subject in (18a) because it can

alternate between postverbal position and preverbal position with *bǎ*. This shows that the postverbal elements in (19a) may be more than just a clause.

Now, let's come back to (15). We believe that the postverbal elements in (15a) are a clause, but the explanation should not be that *rén* be treated as a coindexed pronoun. My explanation is that the word *rén* should be interpreted as *body* (as opposed to *mind*). This way, *rén* now refers to a (physical) part of *Zhāngsān* and can have the same explanation as (18a). This explanation is supported by the following examples, where *rén* is replaced by other (relevant) body part words. Note the parallelism between these examples and (15).[4]

(20) a. Zhāngsān pǎo-de (rén/tuǐ) hěn lèi.
Zhangsan run-DE body/leg very tired
'Zhangsan's body/legs got tired from running.'

b. *Zhāngsān bǎ rén/tuǐ pǎo-de hěn lèi.
Zhangsan BA body/leg run-DE very tired

7.1.2.4. Huang (1991)'s Control Analysis

Huang recognizes the lack of evidence in the widespread view of a small clause analysis for the resultative structure. He proposes a control analysis. Thus the resultative sentence is given the following structure.

(20) a. Zhāngsān kū de kūzhī [Pro fā-le yá]
Zhangsan cry DE dead-branch develop-PER bud
'Zhangsan cried (so much) that even the dead branch developed buds.'

b. Zhāngsān bǎ kūzhī kū de [Pro fā-le yá]
Zhangsan BA dead-branch cry DE develop-PER bud
'Zhangsan cried (so much) that even the dead branch developed buds.'

In this analysis the postverbal NP *kūzhī* 'dead branch' is recognized as the object of the verb and the Pro in the embedded subject position is controlled by the object. Hence this is an object-controlled resultative structure. This analysis not only has advantages in explaining the posssible alternation between the postverbal object and preverbal *bǎ*-phrase, as is shown in the above examples, it is also argued to be supported by the following pieces of evidence.

First, the postverbal NP is an object in the matrix clause because a pronoun in this position must have disjoint reference from the subject as required by Clause C of the Binding Principles and an anaphor in this position must be bound by the subject as is required by Clause A of the Binding Principle. This is shown in (17b) and the following.

[4] In all resultative structure examples with an embedded S, there seems to exist a constraint that the embedded subject must bare certain semantic relation, such as that between a whole and its part, with a matrix NP, either the object NP or the subject NP if there is no postverbal matrix NP. It seems to be the same relation we have seen between the added topic and the comment clause in Chapter 2. Without this relation, the sentences are not acceptable.

(21) a. Zhāngsān$_i$ kū-de tā*$_{i/j}$ hěn shāngxīn.
Zhangsan cry-DE he very sad
'Zhangsan cried so much that he became very sad.'

b. Zhāngsān$_i$ kū-de zìjǐ$_{i/*j}$ hěn shāngxīn.
Zhangsan cry-DE self very sad
'Zhangsan cried so much as to get himself sad.'

The second piece of evidence that Huang gives involves idiom chunks. This is illustrated in (13), (20), and the following.

(22) a. Zhāngsān wèn-de húli lùchū-le wěiba.
Zhangsan ask-DE fox reveal-PER tail
'Zhangsan interrogated so persistently that the fox revealed its tail.'

b. Zhāngsān bǎ húli wèn-de lùchū-le wěiba.
Zhangsan BA fox ask-DE reveal-PER tail
'Zhangsan interrogated so persistently that the fox revealed its tail.'

Huang argues that *húli lùchū-le wěiba* 'the fox has revealed its tail' is a sentential idiom meaning that a fox or a sly person has revealed his secret. However, in (22), both sentences have lost the idiomatic interpretation because the word *húli* 'fox' is used referentially. Since the idiomatic meaning is no longer available in those sentences, then it must be the case that the referential interpretation of the word *húli* 'fox' is forced by the selectional restriction of the matrix verb *wèn* 'ask'. This leads Huang to conclude that *húli* 'fox' must be an argument subcategorized for by the matrix verb *wèn* 'ask' and is not a part of the idiom chunk.

7.2. The Proposed Analysis

I basically agree with Huang (1991) that the postverbal NP in the resultative structure need to be treated as an object of the matrix verb in examples such as in (21) and (22). I also agree with Li (1985) and Goodall (1989) that there are cases where the postverbal NP needs to be treated as the embedded subject. Examine the following example.

(23) Zhāngsān xià-de húli lùchū-le wěiba.
Zhangsan scare-DE fox reveal-PER tail
a. 'Zhangsan was so scared that he revealed his secret.'
b. 'Zhangsan scared the fox so much that it revealed its tail.'

Huang argues that in (23) the NP *húli* 'fox' needs only to be treated as the embedded subject because it does not have a referential reading. This is where I don't agree. I judge (23) to be ambiguous between a referential reading and an idiomatic reading of the NP *húli* '(the) fox', as is shown in our translation. The referential reading is supported in the alternate *bǎ*-phrase version in (23c). But we cannot get the idiomatic reading in (23c).

(23) c. Zhāngsān bǎ húli xià-de lùchū-le wěiba.
Zhangsan BA fox scare-DE reveal-PER tail
'Zhangsan scared the fox so much that it revealed its tail.'

Thus it must be the case that the postverbal elements in the resultative structure has two different structures, depending on the matrix verb. However, the *bǎ*-phrase alternation is available only when the matrix verb is one of the verbs that subcategorizes for an object NP. Therefore I claim that the correct anaysis for (3) and (4) , which are repeated below as (24) and (25), must be one where the postverbal NP is the object of the matrix verb, not the subject of the embedded clause.[5] This analysis is illustrated by the following evidence.

(24) a. Zhāngsan [qǐ-de [Lǐsǐ]$_{NP}$ [líkai-le xuéxiào]$_{VP}$]$_{VP}$.
Zhangsan angry-DE Lisi leave-PER school
'Zhangsan made Lisi so angry that he left school.'

b. Zhāngsan bǎ Lǐsǐ qǐ-de líkai-le xuéxiào.
Zhangsan BA Lisi angry-DE leave-PER school
'Zhangsan made Lisi so angry that he left school.'

(25) a. Nèi-tou dàxiàng [xià-de [Lǐsǐ]$_{NP}$ [liǎng-tiáo tuǐ zhí duōsuo]$_S$]$_{VP}$.
that-CL elephant scare-DE Lisi two-CL leg continuously shake
'That elephant made Lisi so scared that his two legs could not stop shaking.'

b. Nèi-tou dàxiàng bǎ Lǐsǐ xià-de liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant BA Lisi scare-DE two-CL leg continuously shake
'That elephant made Lisi so scared that his two legs could not stop shaking.'

7.2.1. Clausehood

As has been noted in the literature, an embedded clause usually can be separated from the matrix clause by a clause boundary pause, denoted by $ in the following examples. This pause generally occurs at the beginning of the embedded clause. Thus with different locations of this pause we can tell whether an element after the matrix verb is the object or is part of the embedded clause. Examine the following.

(26) a. Zhāngsan zhīdào $ Lǐsǐ jīntiān bù qù xuéxiào.
Zhangsan know Lisi today not go school
'Zhangsan knew that Lisi does not go to school today.'

b. *Zhāngsan zhīdào Lǐsǐ $ jīntiān bù qù xuéxiào.
Zhangsan know Lisi today not go school

[5] There is a less preferred reading in (24a), showing Lisi as the subject of the embedded clause. However, this reading does not have a *bǎ*-alternation.

(i) Zhāngsan qǐ-de [[Lǐsǐ]$_{NP}$ [líkai-le xuéxiào]$_{VP}$]$_S$.
Zhangsan angry-DE Lisi leave-PER school
'Zhangsan so angry that Lisi left school.'

(ii) *Zhāngsan bǎ Lǐsǐ qǐ-de líkai-le xuéxiào.
Zhangsan BA Lisi angry-DE leave-PER school
Intended: 'Zhangsan so angry that Lisi left school.'

(27) a. Zhāngsan gàosù Lǐsǐ $ jīntiān bù qù xuéxiào.
Zhangsan tell Lisi today not go school
'Zhangsan told Lisi that he does not go to school today.'

b. *Zhāngsan gàosù $ Lǐsǐ jīntiān bù qù xuéxiào.
Zhangsan tell Lisi today not go school

In (26) the clause boundary pause occurs only before *Lǐsǐ* and we know that it must be the case that *Lǐsǐ* belongs to the embedded clause and functions as a subject. In (27), on the other hand, this pause only occurs after *Lǐsǐ* and therefore *Lǐsǐ* must be analyzed as the object of the matrix verb. With this in mind, let us consider (24) and (25). In both these sentences I propose that *Lǐsǐ* is subcategorized for by the matrix verb and therefore we expect the clause boundary pause to occur after *Lǐsǐ*, not before it. This prediction is borne out in the following.

(28) a. Zhāngsan qǐ-de Lǐsǐ $ líkai-le xuéxiào.
Zhangsan angry-DE Lisi leave-PER school
'Zhangsan made Lisi so angry that he (=Lisi) left school.'

b. *Zhāngsan qǐ-de $ Lǐsǐ líkai-le xuéxiào.
Zhangsan angry-DE Lisi leave-PER school
Intended:'Zhangsan made Lisi so angry that he (=Lisi) left school.'

(29) a. Nèi-tou dàxiàng xià-de Lǐsǐ $ liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant scare-DE Lisi two-CL leg continuously shake
'That elephent made Lisi so scared that his two legs could not stop shaking.'

b. *Nèi-tou dàxiàng xià-de $ Lǐsǐ liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant scare-DE Lisi two-CL leg continuously shake
Intended: 'That elephent made Lisi so scared that his two legs could not stop shaking.'

Thus, these examples support the analysis that *Lǐsǐ* in (28) and (29) be treated as the object of the matrix clause.

7.2.2. Passivization

Passivization is a syntactic operation that changes an object into a subject. But the operation generally applies to elements within the same clause. (Hashimoto 1988, Radford 1989, Borsley 1991) Thus, if an NP is the subject of the embedded (tensed) clause, it cannot be passivized into the matrix subject position. Examine the following.

(30) a. Zhāngsan zhīdào $ Lǐsǐ cānjiā-le jīntiān de yànhuǐ.
Zhangsan know Lisi participate-PER today DE banquet
'Zhangsan knew that Lisi came to the banquet today.'

b. *Lǐsǐ bèi Zhāngsan zhīdào cānjiā-le jīntiān de yànhuǐ.
Lisi by Zhangsan know participate-PER today DE banquet
'*Lisi was known by Zhangsan that came to the party today.'

(31) a. Zhāngsan yāoqǐng Lǐsǐ $ cānjiā-le jīntiān de yànhuǐ.
Zhangsan invite Lisi participate-PER today DE banquet
'Zhangsan invited Lisi to come to the banquet today.'

b. Lǐsǐ bèi Zhāngsan yāoqǐng cānjiā-le jīntiān de yànhuǐ.
Lisi by Zhangsan invite participate-PER today DE banquet
'Lisi was invited by Zhangsan to come to the banquet today.'

In (30) the verb *zhīdào* 'know' requires a clause as its complement and *Lǐsǐ* functions as the subject of the embedded clause. Therefore it is impossible to passivize it into a matrix subject. In (31), on the other hand, the verb is *yāoqǐng* 'invite', which selects an NP and VP as its complements. Here the NP *Lǐsǐ* functions as the matrix object and therefore it can be easily passivized. Now let's compare the verb *zhīdào* 'know' and *qǐ-de* 'infuriate' in the following sentences.

(32) a. Zhāngsān zhīdào Lǐsǐ hěn shāngxīn.
Zhangsan know Lisi very sad
'Zhangsan knew that Lisi was very sad.'

b. *Lǐsǐ bèi Zhāngsān zhīdào hěn shāngxīn.
Lisi by Zhangsan know very sad
'*Lisi was known by Zhangsan that was very sad.'

(33) a. Zhāngsān qǐ-de Lǐsǐ hěn shāngxīn.
Zhangsan anger-DE Lisi very sad
'Zhangsan made Lisi so angry that he (=Lisi) is very sad.'

b. Lǐsǐ bèi Zhāngsān qǐ-de hěn shāngxīn.
Lisi by Zhangsan anger-DE very sad
'Lisi was made so angry by Zhangsan that he (=Lisi) is very sad.'

The fact that Lisi in (33) can be passivized shows that it functions as the matrix object, not the embedded subject as is the case in (32). Thus the resultative structure in (33) is not a clause. The following examples show that the same analysis should also apply to (24) and (25).

(34) a. Zhāngsan qǐ-de Lǐsǐ $ líkai-le xuéxiào.
Zhangsan angry-DE Lisi leave-PER school
'Zhangsan made Lisi so angry that he (=Lisi) left school.'

b. Lǐsǐ bèi Zhāngsan qǐ-de líkai-le xuéxiào.
Lisi by Zhangsan angry-DE leave-PER school
' Lisi was made so angry by Zhangsan that he (=Lisi) left school.'

(35) a. Nèi-tou dàxiàng xià-de Lǐsǐ $ liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant scare-DE Lisi two-CL leg continuously shake
'That elephent made Lisi so scared that his two legs could not stop shaking.'

b. Lǐsǐ bèi nèi-tou dàxiàng xià-de liǎng-tiáo tuǐ zhí duōsuo.
Lisi by that-CL elephant scare-DE two-CL leg continuously shake
'Lisi was so scared by that elephent that his two legs could not stop shaking.'

7.2.3. The *(liǎn)...dou* Construction

Another piece of evidence against a clause analysis in some of the resultative structures comes from the ***(liǎn)...dou*** construction. In Gao (1995), it is argued intensively that the function of ***(liǎn)... dou*** is to make sure that the elements that ***(liǎn)...dou*** has scope over must occur preverbally. Thus in the following examples, ***yī-jù huà*** 'one word' is subcategorized for by the verb ***shuōbuchūlai*** 'be unable to say (out)' and in an ordinary sentence it occurs postverbally. However, in a sentence with the ***(liǎn)...dou*** construction, ***yī-jù huà*** must occur before the verb. What is relevant here is that ***yī-jù huà*** not only must occur preverbally, it can also occur at the clause initial position, thus marking the beginning of the clause.

(36) a. **Lǐsǐ shuōbuchūlai yī-jù huà.**
Lisi say-out one-CL word
'Lisi cannot say a single word.'

b. **Lǐsǐ lián yī-jù huà dou shuōbuchūlai**
Lisi LIAN one-CL word DOU say-out
'Lisi cannot say even a single word.'

c. **Lián yī-jù huà Lǐsǐ dou shuōbuchūlai**
LIAN one-CL word Lisi DOU say-out
'Lisi cannot say even a single word.'

When (41a) is embedded, as is shown in (37), the same patterning is also exhibited.

(37) a. **Zhāngsān zhīdào $ Lǐsǐ shuōbuchūlai yī-jù huà.**
Zhangsan know Lisi say-out one-CL word
'Zhangsan knows that Lisi cannot say a single word.'

b. **Zhāngsān zhīdào $ Lǐsǐ lián yī-jù huà dou shuōbuchūlai**
Zhangsan know Lisi LIAN one-CL word DOU say-out
'Zhangsan knows that Lisi cannot say even a single word.'

c. **Zhāngsān zhīdào $ lián yī-jù huà Lǐsǐ dou shuōbuchūlai**
Zhangsan know LIAN one-CL word Lisi DOU say-out
'Zhangsan knows that Lisi cannot say even a single word.'

However, this construction can only apply within the clause boundary. As we can see in (38), this construction is no longer possible if the scoped element appears beyond the embedded clause.

(38) a. **Zhāngsān gàojiè Lǐsǐ $ bū yào shuō yī-jù huà.**
Zhangsan tell-warn Lisi not want say one-CL word
'Zhangsan warned Lisi not to say a single word.'

b. **Zhāngsān gàojiè Lǐsǐ $ lián yī-jù huà dou bū yào shuō**
Zhangsan tell-warn Lisi LIAN one-CL word DOU not want say
'Zhangsan warned Lisi not to say even a single word.'

c. *Zhāngsān gàojiè lián yī-jù huà Lǐsǐ $ dou bū yào shuō.
*Zhangsan tell-warn LIAN one-CL word Lisi DOU not want say
Intended: 'Zhangsan warned Lisi not to say even a single word.'

Now let's consider the interaction of this construction with the resultative structure such as (39). We should expect the same result as in (38). This prediction is borne out.

(39) a. Zhāngsān qǐ-de Lǐsǐ shuōbuchūlai yí-jù huà.
Zhangsan infuriate-DE Lisi say-out one-CL word
'Zhangsan made Lisi so angry that he (=Lisi) conldn't say a single word.'

b. Zhāngsān qǐ-de Lǐsǐ lián yí-jù huà dou shuōbuchūlai
Zhangsan infuriate-DE Lisi LIAN one-CL word DOU say-out
'Zhangsan made Lisi so angry that he (=Lisi) cannot say even a single word.'

c. *Zhāngsān qǐ-de lián yí-jù huà Lǐsǐ dou shuōbuchūlai
Zhangsan infuriate-DE LIAN one-CL word Lisi DOU say-out
Intended: 'Zhangsan made Lisi so angry that he cannot say even a single word.'

My explanation for the unacceptability of (39c) is that *Lǐsǐ* is not part of the embedded clause and stretching the construction *(lián)...dou* beyond it is not acceptable. Thus I have once again shown that *Lǐsǐ* in (39) is not part of the resultative structure and therefore cannot be analyzed as the embedded subject.

7.2.4. Emphasis with SHI

Still another piece of evidence against the clause analysis of (24) comes from the use of emphatic *shǐ*. The semantics of the *shǐ*-structure is very much like that of a cleft sentence in English but syntactically it takes a different form. Instead, in Chinese, the emphatic word *shǐ* is always placed before the element that *shǐ* is used to emphasize. However, there is a position that *shǐ* cannot be placed on. This is the position just before the unmarked complement. Examine the following.

(40) a. Zhāngsān nòngqíngchu-le zhè-jiàn shǐ.
Zhangsan make-clear-PER this-CL matter
'Zhangsan clarified this matter.'

b. Shǐ Zhāngsān nòngqíngchu-le zhè-jiàn shǐ.
SHI Zhangsan make-clear-PER this-CL matter
'It is Zhangsan who clarified this matter.'

c. Zhāngsān shǐ nòngqíngchu-le zhè-jiàn shǐ.
Zhangsan SHI make-clear-PER this-CL matter
'Zhangsan did clarify this matter.'

d. *Zhāngsān nòngqíngchu-le shǐ zhè-jiàn shǐ.
Zhangsan make-clear-PER SHI this-CL matter
Intended: 'It is this matter that Zhangsan clarified.'

Thus we can see that *shǐ* can be placed before the subject, or the verb, but not the object. This is also true with complex sentences, as is shown in the following.

(41) a. Shǐ Zhāngsān nòngqíngchu-le Lǐsí hěn shāngxīn.
SHI Zhangsan make-clear-PER Lisi very sad
'It is Zhangsan who has found out that Lisi was very sad.'

b. Zhāngsān shǐ nòngqíngchu-le Lǐsí hěn shāngxīn.
Zhangsan SHI make-clear-PER Lisi very sad
'Zhangsan did find out that Lisi was very sad.'

c. Zhāngsān nòngqíngchu-le shǐ Lǐsí hěn shāngxīn.
Zhangsan make-clear-PER SHI Lisi very sad
'Zhangsan has found out that it was Lisi who was very sad.'

b. Zhāngsān nòngqíngchu-le Lǐsí shǐ hěn shāngxīn.
Zhangsan make-clear-PER Lisi SHI very sad
'Zhangsan has found out that Lisi was indeed very sad.'

In (41) *shǐ* can be placed before *Lǐsǐ* because *Lǐsǐ* is the subject of the embedded clause. Thus if *shǐ* can be placed before *Lǐsǐ* in (24), than it must be the case that *Lǐsǐ* is the embedded subject, not the matrix object, for if it were the object, then the emphatic word *shǐ* cound not be placed before it. The following examples show that *Lǐsǐ* in the resultative structures is indeed the matrix object and not the embedded subject.

(42) a. Shǐ Zhāngsān qǐde Lǐsí líkai-le xuéxiào.
SHI Zhangsan infuriate-PER Lisi leave-PER school
'It is Zhangsan who made Lisi so angry that he (=Lisi) left the school.'

b. Zhāngsān shǐ qǐde Lǐsí líkai-le xuéxiào.
Zhangsan SHI infuriate-PER Lisi leave-PER school
'Zhangsan did make Lisi so angry that he (=Lisi) left the school.'

c. *Zhāngsān qǐde shǐ Lǐsí líkai-le xuéxiào.
Zhangsan infuriate-PER SHI Lisi leave-PER school
Intended: 'It is Lisi that Zhangsan made so angry that he (=Lisi) left the school.'

d. Zhāngsān qǐde Lǐsí shǐ líkai-le xuéxiào.
Zhangsan infuriate-PER Lisi SHI leave-PER school
'Zhangsan made Lisi so angry that he (=Lisi) did leave the school.'

The unacceptabilty of (42c) again suggets that Lisi in the resultative structure of (24) is not the embedded subject. Therefore it need to be treated as the object of the matrix verb *qǐ-de*.

7.2.5. The Binding Principles

As has been argued in Huang 1991, the facts of anaphora also support the matrix object analysis of (24). According to the Binding Principles, disjoint reference is required between a pronoun and its co-arguments. That is, a pronoun cannot be co-indexed with other arguments within the same clause; however, it is allowed to be freely co-indexed with an argument outside the clause. A reflexive pronoun, on the other hand, must be bound by an argument that is less oblique. The following are more examples to illustrate this point.

(43) a. Zhāngsān$_i$ qǐde tā*$_{i/j}$ líkai-le xuéxiào.
Zhangsan infuriate-PER he leave-PER school
'Zhangsan made him so angry that he left the school.'

b. Zhāngsān$_i$ qǐde zìjǐ$_{i/*j}$ líkai-le xuéxiào.
Zhangsan infuriate-PER self leave-PER school
'Zhangsan was angry with himself that he left the school.'

The facts that *tā* 'he', a pronoun, must have disjoint reference with Zhangsan and *zìjǐ* 'self', a reflexive, must be bound by Zhangsan in (41) show that the postverbal NP and Zhangsan, which is the matrix subject, are indeed within the same clause. Therefore our matrix object analysis for the postverbal NP in (24) is correct.

7.2.6 The Proposed Analysis

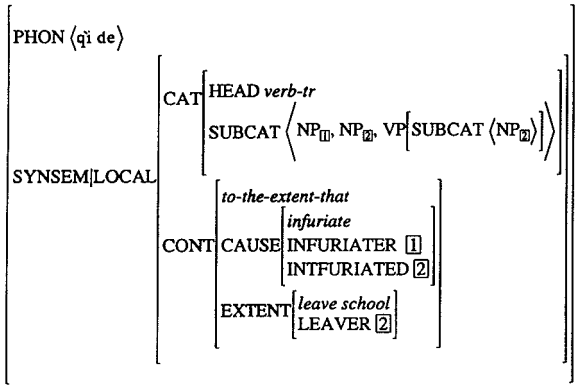
Now we have shown that sentences with resultative structures like (3) must be treated as control structures, because the postverbal NP has been shown to be subcategorized for by the matrix verb. In HPSG control is analyzed as coindexing. Thus the verb *qǐ-de* in (3) must subcategorize for both an NP and a VP, much like verbs such as *persuade* and *ask* in English in the following sentences.

(44) a. George persuaded Bob to run for president.
b. Mary asked Bill to stop smoking.

In light of so much compelling evidence, I propose that *qǐ-de* be analyzed as a control verb whose most patient-like argument is coindexed with the most agent-like argument in the embedded clause. The alternation between (3a) and (3b) shows that it is also a middle verb. Therefore, I propose the following lexical entry for the verb *qǐ-de* in our analysis to generate the sentence in (3a).

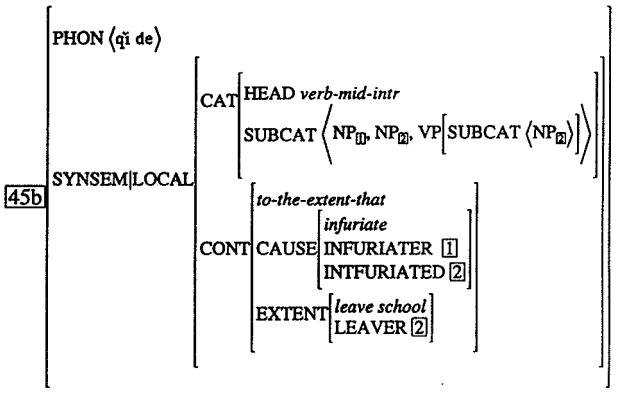
(45) a. The lexical entry for the transitive verb *qǐ-de*

45b ⇓



We can see that the verb *qǐde* is just a transitive verb with an extra VP complement attached. Like certain other transitive verbs, I propose that (45a) is the transitivized alternation of the middle intransitive verb *qǐ-de* given as (45b), which, in turn, is responsible for (3b).

(45) b. The lexeme for the intransitive middle verb *qǐ-de*

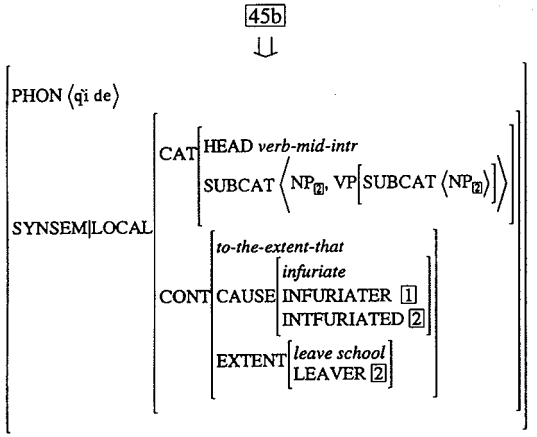


The compatibility of the change in the resultative structure with the RVC sentences is obvious from the above lexical entries. It is very important that the argument alternation with the resultative structure be kept the same as the sentences with RVCs. For this not only enables us to use the same argument alternation rules as we do for simple sentences, but also makes it possible to see the same valence change in the resultative structure as with the simple sentence. Consider the fact that with some middle intransitive RVCs it is possible that the most agent-like argument may be suppressed to get a single-argument sentence. For instance, in the following sentences we see that the verb *qǐsǐ* may change from a transitive verb to an intransitive one also by shrinking its valence to one.

(46) a. Zhāngsan qǐsǐ-le Lǐsǐ
Zhangsan infuriate-die-PER Lisi
'Zhangsan made Lisi extremely angry.'
b. Zhāngsan bǎ Lǐsǐ qǐsǐ-le
Zhangsan BA Lisi infuriate-die-PER
'Zhangsan made Lisi extremely angry.'
c. Lǐsǐ qǐsǐ-le
Lisi infuriate-die-PER
'Lisi was extremely angry.'

We can see that the examples in (46) characterize the verb *qǐsi* as a middle verb. This is also true of the verb *qǐde* because its valence can also be shrunk by one (through the agent argument suppression rule), as is witnessed in (45c) below.

(45) c. The third lexical entry for *qǐ-de* (with an example below)



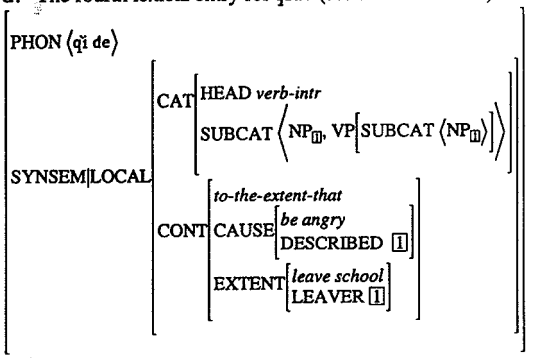
c. Lǐsì qǐ-de líkai-le xuéxiào.
Lisi angry-DE leave-PER school
'Lisi was made so angry (by someone) that he left the school.'

As can be expected, one of the consequences of the valence change is that the object-controlled structure now becomes subject-controlled.[6] Since the sentence in (45c) is ambiguous, I propose the fourth lexical entry of *qǐde* for (45d)

[6] This is expected since agent argument suppression of a middle verb is considered as passivization without morphological alternation of the verb. Thus (49c) has the same interpretation as (i) below.

(i). Lǐsì bèi-qǐ-de líkai-le xuéxiào.
Lisi BEI-angry-DE leave-PER school
'Lisi was made so angry that that he left school.'

(45) d. The fourth lexical entry for *qǐde* (the second lexeme)



d. Lǐsì qǐ-de líkai-le xuéxiào.
Lisi angry-DE leave-PER school
'Lisi was so angry that he left the school.'

7.2.7 Idiom Chunks

We have seen that the idiom chunks generally support the control analysis. However, Goodall (1989) has claimed that the sentences in (13) keep their idiomatic interpretation.

(13) a. Zhāngsān kū de tiěshù kāi-le huā.
Zhangsan cry DE iron-tree open-PER flower
'Zhangsan cried (so much) that something very unusual happened.'

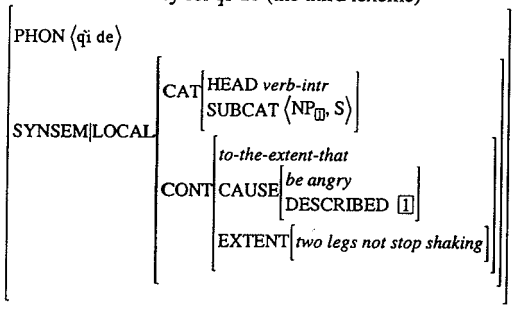
b. Zhāngsān bǎ tiěshù kū de kāi-le huā.
Zhangsan BA iron-tree cry DE open-PER flower
'Zhangsan cried (so much) that something very unusual happened.'

Huang (1989) has criticized the translation in (13b) as incorrect because *tiěshù* 'iron tree' can only have a referential reading, and insisted that raising to object is not the correct analysis for the sentence. This much I agree. But I also admit that (13a) is ambiguous between an idiomatic reading and a referential reading. That is, besides the translation that Goodall gives, I find the sentence can also mean 'Zhangsan cried so much that even the iron tree blossomed'. Huang also notices that the following sentence with another sentential idiom chunk can keep its idiomatic interpretation, but I also find this sentence ambiguous.

(47) Zhāngsān xià-de húli lùchu-le wěibā.
Zhangsan scare-DE fox reveal-PER tail
a. 'Zhangsan was so scared that he revealed his secret.'
b. 'Zhangsan scared the fox so much that it revealed its tail.'

In light of these ambiguous examples, I propose that a clause analysis of the resultative structure must also be allowed. Therefore, in addition to the lexical entries we give to *qǐ-de* above, we also list the following for the verb *xià-de* (and *kū-de*)

(45) e. A fifth lexical entry for *qǐ-de* (the third lexeme)



In (45e) there is no matrix object NP for ***bǎ-phrase*** alternation and this analysis is supported by the fact that the ***bǎ-phrase*** version of (47) is no longer ambiguous. The analysis of (45e) is also shown to be necessary for other resultative sentences such as the following.

(48) a. Lǐsì qǐ-de **liǎng-tiáo tuǐ** zhí duōsuo.
Lisi angry-DE **two-CL** leg continuously shake
a. 'Lisi was so angry that his legs could not stop shaking.'
b. 'Lisi was made so angry (by someone) that his legs could not stop shaking.'

In (48a) the postverbal elements must be treated as a clause for the following reasons. First, the clause boundary pause only falls before ***liǎng-tiáo tuǐ*** 'two legs', indicating that the embedded clause starts from this NP. Second, the emphatic SHI can also be placed before the NP ***liǎng-tiáo tuǐ***, showing that this NP is not the object. Third, the NP ***liǎng-tiáo tuǐ*** cannot undergo passivization, indicating that it is not the matrix object. Fourth, the NP ***liǎng-tiáo tuǐ*** can be under the scope of *(lián)...dou* and stay after the matrix verb. This is shown in the following examples.

(48) c. Zhāngsān qǐ-de $ liǎng-tiáo tuǐ *$ zhí duōsuo.
Zhangsan angry-DE two-CL leg continuously shake
'Zhangsan was so angry that his legs could not stop shaking.'

d. Zhāngsān qǐ-de **shì** liǎng-tiáo tuǐ zhí duōsuo.
Zhangsan angry-DE SHI two-CL leg continuously shake
'Zhangsan was so angry that it is his legs that could not stop shaking.'

e. *Liǎng-tiáo tuǐ **bèi** Zhāngsān qǐ-de zhí duōsuo.
two-CL leg BEI Zhangsan angry-DE continuously shake
Intended: 'Zhangsan's legs were so infuriated by him that they could not stop shaking.'

f. Zhāngsān qǐ-de **lián** liǎng-tiáo tuǐ dōu zhí duōsuo.
Zhangsan angry-DE LIEN two-CL leg DOU continuously shake
'Zhangsan was so angry that even his legs could not stop shaking.'

The fact that the NP ***liǎng-tiáo tuǐ*** 'two legs' in (48) cannot be the matrix object may be for still another reason. That is, the matrix object position is reserved for another NP. This is shown in (49).

(49) a. Nèi-tou dàxiàng qǐ-de Lǐsì liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant angry-DE Lisi two-CL leg continuously shake
'That elephant made Lisi so angry that his (=Lisi) two legs could not stop shaking.'

In (49) the postverbal NP ***Lǐsì*** must be treated as the matrix object because all the tests we used so far prove that the analysis is a correct one.

(49) b. Nèi-tou dàxiàng qǐ-de *$ Lǐsì $ liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant angry-DE Lisi two-CL leg continuously shake
'That elephant made Lisi so angry that his two legs could not stop shaking.'

c. Nèi-tou dàxiàng qǐ-de ***shì** Lǐsì shì liǎng-tiáo tuǐ zhí
that-CL elephant angry-DE SHI Lisi SHI two-CL leg continuously
duōsuo.
shake
'That elephant made Lisi so angry that it is his two legs that could not stop shaking.'

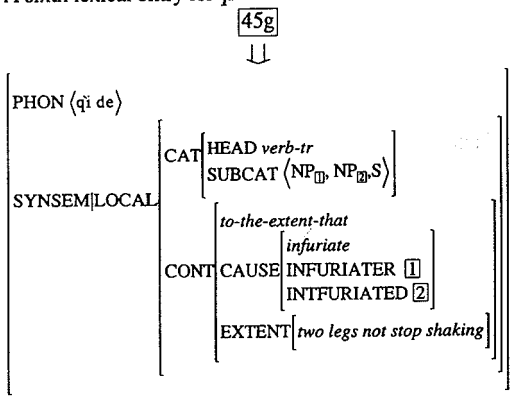
d. Lǐsì bèi nèi-tou dàxiàng xià-de liǎng-tiáo tuǐ zhí duōsuo.
Lisi by that-CL elephant scare-DE two-CL leg continuously shake
'Lisi was so scared by that elephent that his two legs could not stop shaking.'

e. *Nèi-tou dàxiàng qǐ-de **lián** Lǐsì liǎng-tiáo tuǐ dōu zhí
that-CL elephant angry-DE LIEN Lisi two-CL leg DOU continuously
duōsuo.
shake
Intended: 'That elephant made even Lisi so angry that his two legs could not stop shaking.'

f. Nèi-tou dàxiàng **bǎ** Lǐsì qǐ-de liǎng-tiáo tuǐ zhí duōsuo.
that-CL elephant BA Lisi angry-DE two-CL leg continuously shake
'That elephant made Lisi so angry that his two legs could not stop shaking.'

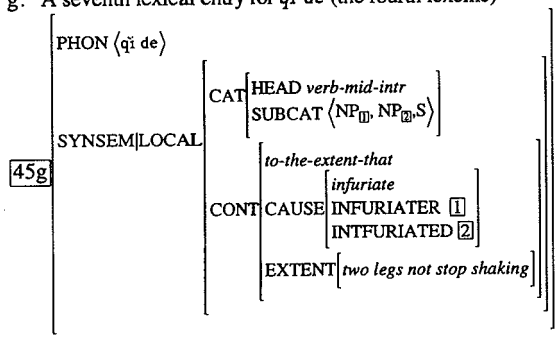
If (48a) is generated by the lexical entry in (45e), then I must propose another lexical entry in (45f) in order to account for the sentence in (49a).

(45) f. A sixth lexical entry for *qǐ-de*



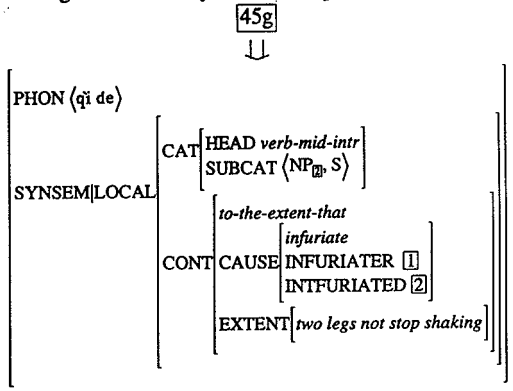
As we can see from (49), the *bǎ*-alternation in (49f) suggests that a seventh lexical entry is needed for *qǐ-de*, which is responsible for (45h) (through agent argument suppression rule) and (45f) (through middle transitivization).

(45) g. A seventh lexical entry for *qǐ-de* (the fourth lexeme)



Finally, I give the eighth lexical entry for *qǐde* to explain the ambiguous (48a). Thus (45h) is responsible for the interpretation of (48b).

(45) h. The eighth lexical entry for the verb *qǐde*



7.3. Conclusion

In this Chapter I have argued that the postverbal elements of the resultative structure should not always be analyzed as a small clause. The alternation with the *bǎ*-construction is always possible when the postverbal NP is analyzed as the matrix object and therefore I have shown that resultative structure does not pose any problem to the claim made in this paper that valence alternation is always confined to within the clause boundary. Since the resultative structure is always involved with a verb that has *de* attached to it, I cannot conclude this chapter without having a few words on the analysis of this important lexical item.

7.3.1 The analysis of *de* in V-*de*

The word *de* in a resultative structure has several unique properties. In the literature it has been given several different analyses. For instance, in Gao 1995, it is introduced as a complementizer because it is argued there that it always serves as a starting point of a resultative clause and it can block the incorporation of two verbs into a RVC. However, as we have seen in the previous discussion, this is not really the case since we have shown that the postverbal NP can be the object of the matrix verb.

Dai (1992) has argued for an analysis that treats *de* as an inflectional morpheme because it always follows a verb and no other lexical elements can intervene between the two. The use of *de* also blocks the verb from being further inflected with other morphemes such as the perfective *le* and the progressive *zhe*. However, as I see it, there is a very important difference between *de* and other inflectional morphemes in Chinese. Other

inflectional morphemes generally do not change the categorical information of the verb they are attached to. For instance, the verb *chī* 'eat' generally subcategorizes for an NP as its object, and so is *chī-le* 'have eaten' or *chī-zhe* 'is eating'. But when *de* is attached to a verb, the verb must have an (additional) VP or clause and may have an additional *bǎ*-marked complement. This is clearly shown in the following examples with the verb *xià* 'scare' and *xià-de* 'scare-DE'

(50) a. Zhāngsān xià-le yī-tiào
Zhangsan scare-PER one-CL
'Zhangsan was scared once.'

b. Zhāngsān xià-le Lǐsi yī-tiào.
Zhangsan scare-PER Lisi one-CL
'Zhangsan scared Lisi once.'

c. *Zhāngsān xià-le tiào-le qǐlai
Zhangsan scare-PER jump-PER up

d. *Zhāngsān xià-le Lǐsi tiào-le qǐlai
Zhangsan scare-PER Lisi jump-PER up

(51) a. *Zhāngsān xià-de yī-tiào
Zhangsan scare-DE one-CL

b. *Zhāngsān xià-de Lǐsi yī-tiào.
Zhangsan scare-DE Lisi one-CL

c. Zhāngsān xià-de tiào-le qǐlai
Zhangsan scare-DE jump-PER up
'Zhangsan was so scared that he jumped up.'

d. Zhāngsān xià-de Lǐsi tiào-le qǐlai
Zhangsan scare-DE Lisi jump-PER up
'Zhangsan scared Lisi so much that he jumped up.'

Thus there seems to be a direct connection between the embedded VP (or clause) and *de*. The inflectional morpheme analysis of *de* seems to have missed this point. In fact, this connection is so obvious that it is even suggested (Liu 1994) to be a clitic pronoun in the sense of English *it* in the following sentences.

(52) a. John believes it necessary to hold a committee meeting tomorrow.

b. I have made it clear that there is no need to panic on such situation.

However, there is one thing that prevents it from falling into the category of clitics. As has been laid out in Zwicky & Pullum (1983) and Zwicky (1985), a clitic generally does not have a lexical host. But we have seen that *de* is used after nothing but a verb in Chinese.

Although *de* can change the subcategorization frame of the stem verb, it may fall short of being classified as a derivational morpheme for its lack of the following derivational properties. First, derivational morphemes are not very productive and are very sensitive to the kind of stem they are attached to. But *de* can virtually be attached to almost all verbs in

Chinese. Second, a derivational morpheme generally does not block any further attachment of inflectional morphemes. But any verb with *de* is no longer available for (further) inflection.

Although I am not quite clear into what category we can classify *de* at this point , I can summarize what we have found about this unique morpheme. The following are a list of properties that *de* has.

(53) a. It always follows a verb and nothing else can intervene,

b. It denotes the meaning of 'do something to so great an extent that'.

c. It changes the categorical information of the verb immediately preceding it.

d. There is a connection between it and the embedded VP or clause.

e. It blocks the verb from being inflected.

f. It is not used as an independent word.

Thus *de* seems to be a cliticized inflectional verbal suffix but I will leave it for further classification.

Chapter Eight

CONCLUSION

8.1. Summary

In this paper, I have looked at the Chinese argument structure from a different perspective. I have shown that topic in Chinese can be uniformly treated as additional-type. The trace in the topicalizational analysis is argued to be a lexically unrealized resumptive pronoun. Thus, all NP/LP arguments in a sentence can appear in two different forms, marked or unmarked. An NP/LP argument in the topic, the subject, or the object position must appear in unmarked forms. Otherwise, a marker before the argument is needed. This analysis reveals that the so-called prepositions/coverbs generally have no semantic denotations. Their occurrance with an argument NP/LP is only to satisfy some syntactic requirements and is predictable by the thematic roles they fill in the CONTENT value of the head verb.

The marker analysis shows that the linear order of a sentence is (topic,) subject, marked complements and object. This sequence very closely resembles the SUBCAT list of the head verb where argument structure is argued to be hierarchical according to their proto-role properties. Thus the argument with the most agent-like properties will be selected to the subject position and the one with the most patient-like properties to the object positon if the verb is transitive. The valence alternation is allowed because Chinese tolerates a variety of arguments, including marked complements and unmarked complements. Thus any argument that is not selected to fill the unmarked NP/LP positions, namely, subject, and object, will end up as a marked complement. All marked complements are placed in preverbal positions but after the subject. This is the well known SOV word order in contemporary Chinese. Therefore the valence alternation between the *bǎ* and non-*bǎ* constructions is seen to be a special phenomenon in a language in transition from SVO to SOV. We suggest that this word order change is due to external influence from Japanese and Korean.

Unlike previous studies, I have argued for a syntactic distinction between nominal phrases and locative phrases. A locative ending is analyzed as the lexical head that subcategorizes for an NP, with which it combines to form a different syntactic category,

namely, a locative phrase. The distinction proves to be valuable in explaining the different behavior of LP in binding anaphoric expressions, verb subcategorization, and the linear order of the sentences. For instance, some verbs require only an LP object that may not always be the most patient-like argument.

One of the most challenging problems in Chinese grammar is to explain the unique *bǎ*-construction. In this paper I have looked at various claims about the *bǎ* construction and argued for a head-final RVC analysis for the *bǎ*-construction. The advantage of this analysis is manifold. First, it explains why the verb in the *bǎ*-construction cannot be monosyllabic. Second, under this analysis, the *bǎ*-phrase is shown to always come from the first argument of the second component verb. By the first argument, I mean the most agent-like argument. This analysis explains why the *bǎ*-phrase has many subject preperties including definiteness/specificity. These properties lead to the claim in Tsao (1987) and Gao (1991) that the *bǎ*-phrase is the secondary topic/subject of the sentence. Together with the left-headed RVCs, the multiple ambiquous sentences are no longer a puzzle in the grammar. With the analysis of ba& as a marker, rather than a preposition, the right-headed RVCs are unavoidable, because both are shown to be head-final properties. Therefore it is not surprising at all that ba&-construction is shown to be closely linked (only) to right-headed RVCs. This analysis also explains why a verb with *bǎ*-phrase always behaves like an unaccusative verb. Besides, the untopicalizable/unrelativizable unmarked complements can now be pin-pointed to the transitive middle verbs.

The analysis of the resultative construction in this thesis is consistent with the claim that valence alternation takes place within the clause boundary. Various linguistic facts show that the the small clause analysis of postverbal NP/LP and VP is not tenable and therefore the alternative treatment that the postverbal NP/LP be the unmarked complement of the matrix clause is well established. This analysis shows that *-de* is best treated as a verbal morpheme that changes the subcategorization frame of the verb it attaches to.

The analysis in this thesis shows that Chinese sentential structure is in the process of changing from SVO to SOV.

8.2. Future Studies

Even though this thesis has given an integrated analysis of Chinese argument structure, there remain some issues that are raised by the current analysis that need to be addressed in future studies. First comes the effect of topic on long distance anaphor binding in Chinese. As has been argued in Tang (1990) that there are two kinds of anaphors. The long distance anaphor such as the simple reflexive *zìjǐ* is subject-oriented. However, previous

discussions were all under the assumption that there are only two kinds of arguments that a verb can have, the subject and the object. In this paper we have added that topic, besides the marked complements, is also an unmarked (NP/LP) argument. We need to study the consequences of this analysis for the binding of long-distance anaphors.

Second, in Chapter 2, I made a suggestion that the wh-trace in the topicalizational analysis need to be treatyed as a lexically unrealized (phonologically null) resumptive pronoun. This seems to be a very skechy claim and the comparison of the overt resumptive pronoun to the null resuptive pronoun needs to be further investigated. For instance, we may want to see if the covert resumptive pronoun also obeys the various constraints of the wh-trace as has been discussed in the literature.

Third, in Chapter 7, I have studied the structure of resultative constructions. I proposed that when the verbal suffix *-de* is added to a verb, its subcategorization frame also changes. However, there are issues uniquely related to *-de* that I have not clearly discussed. For instance, a verb with *-de* suffix seems to allow *bǎ*-construction which has already been shown to be closely connected to right-headed RVCs. Could it mean that V-de is also right-headed? What impact does it have on the debate whether resultative constructions should be analyzed as primary predication or secondary predication? Further studies on the syntactic properties of *-de* is also needed.

Fourthly, with the proposal of Chinese undergoing the change from SVO to SOV, further studies are also needed on how the prepositions are lost, where case markers come from, and the historic development of prepositions into case markers.

Appendix

HISTORICAL CONSIDERATIONS OF PREPOSITIONS

A.1. Historical Considerations of Prepositions

I have argued that Chinese is changing from an SVO to an SOV language and the use of prepositions is gradually being phased out in contemporary Chinese. Thus it may be very helpful to know how prepositions were used in archaic Chinese. In this appendix I am going to show that in archaic Chinese, prepositions were widely used and prepositional phrases generally appeared after verb phrases. The use of prepositions can also be seen in some residues of set phrases and idioms in Modern Chinese.

The distinction between verbs and prepositions in archaic Chinese is not obvious. This is because archaic Chinese is not an inflectional language. That is, there is basically no inflectional morphology in archaic Chinese and verbs and prepositions use the same basic form all the time. Thus the discussion in Chapter 4 on the distinction between verbs and prepositions is not of much help in archaic Chinese. However, there is a functional difference between prepositions and verbs: prepositions cannot function as predicates and therefore we do not see them form sentences by themselves. Thus if we see a word that can introduce an NP but cannot be used as the head of a sentence, we know that this must be a preposition, not a verb.

According to the Chinese dictionary, there are many prepositions in archaic Chinese. However, not all of them have survived in modern Chinese. I will discuss briefly discuss a few which have had a profound influence on modern Chinese. The examples in archaic Chinese used here are from well known classics. We start with intrumental *yǐ*.

A.1.1. Instrumental *yǐ*

One of the major functions of the word *yǐ* is to introduce an instrumental NP. It has the same denotation as the contemporary word *yòng*. Examine the following.

(1) Tóu wǒ yǐ mù guā, bào zhí yǐ qióng jū
present me with tree melon return him with golden(jade) jade
'(He) presented me with a papaya and (I) returned him with a golden jade.'

(2) Shéng zhì yǐ fǎ
restrict him with law
'Punish him according to the law.'

Thus in the above examples we see that when *yǐ* is used as a preposition, it introduces an NP that functions as an instrument and the prepositional phrase generally follows the verb phrase. However, in early modern Chinese, especially in formal writings, we begin to see preverbal use of *yǐ*-phrases, as in the set phrases *yǐ xuè huán xuè* 'return blood with blood' and *yǐ bù dài chē* 'replace car-riding with walking'. The contemporary Chinese version of these two sayings are given as (3) and (4) respectively.

(3) Xuèzhài yào yòng xuè lái huán.
blood-debt must use blood in-order-to return
'The debt of blood must be repaid with blood.'

(4) Yòng bùxíng qǔdài chèngchē
use walk replace ride-car
'Take a walk rather than a bus.'

As we can see, in contemporary Chinese, the prepositional use[1] of *yǐ* is now gradually replaced with *yòng*.

A.1.2. Locative *yú*:

The word *yú* is used as a preposition in the following examples to denote time or location.

(5) Shèn zhōng yú shǐ
worry ending at beginning
'Worry about the ending (right) from the beginning.'

(6) Xù chèng qí chē xiān sì yú mén wài.
son-in-law ride that carriage before wait at door outside
'The carriage that the son-in-law rides is already waiting outside the door.'

As we can see, in archaic Chinese the phrase headed by *yú* always follow the verb phrase whether it denotes time or location. This usage still lingers on in formal style of contemporary Chinese. Examine the following.

(7) Zhōnghuá rénmín gònghéguó chénglì yú yījiǔsìjiǔ nián.
China people republic found at one-nine-four-nine year
'The People's Republic of China is founded in 1949.'

(8) Tā bìyè yú Xīnjiāng Dàxué
she graduate at Xinjiang University
'She graduated from Xinjiang University.'

[1] Other senses of *yǐ*, though, survive the historic development and are still in use in the following.

(i) Yǐ wǒ de kànfa, tā jīnwǎn bù huì lái le
according-to I DE point-of-view he tonight not possible come LE
'I don't think he will come tonight.'

However, the postverbal *yú* phrase in contemporary Chinese seems to be very closely attached to the verb and no other lexical items such as the object can intervene between the two.

(9) a. Zhè-běn shū xiě yù Shànghǎi
this-CL book write at Shanghai
'This book was written in Shanghai.'

b. *Tā xiě-le zhè-běn shū yù Shànghǎi
he write-PER this-CL book at Shanghai
Intended: 'He wrote this book in Shanghai.'

Cf c. Tā zài/*yú Shànghǎi xiě-le zhè-běn shū.
he ZAI/*at Shanghai write-PER this-CL book
'He wrote this book in Shanghai.'

(10) a. Nèi-fù huà chuàngzuò yù yījiǔliùsān nián wǔ yuè
that-CL painting create-make at one-nine-six-three year five month
'That painting was made in May, 1963.'

b. *Tā chuàngzuò-le nèi-fù huà yù yījiǔliùsān nián wǔ yuè
he create-make-PER that-CL painting at one-nine-six-three year five month
Intended: 'He created that painting in May 1963.'

Cf c. Tā (yù) yījiǔliùsān nián wǔ yuè huà-le nèi-fù huà.
he at one-nine-six-three year five month draw-PER that-CL painting
'He created that painting in May 1963'

Thus, what we see from the above examples is that the word *yú* is compounded with the preceding verb, just like the compound verbs with *zài* discussed in previous chapters. The preverbal use of *yú* phrases is now limited to denoting time only and even in this case the word *yú* becomes optional. When a locational phrase appear preverbally, the marker *zài* has replaced the preposition *yú*. Again this shows that the prepositional use of *yú* is gradually disappearing from contemporary Chinese.

A.1.3. Source *zì*:

The word *zì*, when used as a preposition, introduces the source or starting point, as is the case with the contemporary word co!ng. This can be seen in the following examples.

(11) Yǒu péng zì yuǎn fāng lái, bù yì lè hū?
have friend from far area come not this happy HU
'(We) have some friends coming from far away. Isn't this something to be happy about?'.

(12) Zèng zì yòu xí wǔ.
I from childhood practice martial-art
'I have been learning martial arts since I was a child.'

Thus, *zì* as a preposition seems to head a prepositional phrase but is positioned before the verb phrase. This is understandable, considering the fact that *zì* phrase generally denotes the starting point of an event (in (12)) or direction (in (11)). Lack of inflectional

morphology makes archaic Chinese more depend on word order to denote the sequence of events and this is still true in modern Chinese (Tai 1985). Thus the beginning of an event usually is considered earlier that the whole event and therefore the phrase denoting the beginning of event is understandably positioned before the verb phrase that denotes the whole event.

In contemporary Chinese, *zǐ* has gradually lost its independent word status. We often see it lexicalized with other word in compounds. The preverbal use has been replaced by *cóng* (see Chapter 4 for discussion of *cóng* as a case marker).

(13) a. Tā láizì Běijing.
he come-from Beijing
'He comes from Beijing.'

b. Tā *zì/cóng Běijing lái.
he from Beijing come
'He comes from Beijing.'

(14) Zìcóng lái měiguó yǐhòu, tā hái méi huí-guò jiā.
since come U.S. after he yet not return-PAST home
'Since he came to the U.S., he has not returned home yet.'

In (13a) *zì* become part of the compound word *láizì*. In (13b) we see that *zì* is no longer used in Chinese to denote a source argument. In (14) *zì* combines with *cóng* to form a new preposition/complementizer. Source-denoting *zì* now can only be seen in some set phrases or idioms such as *zì yòu* 'since childhood', in which *zì* is not exchangeable with *cóng*. This can be seen in the unacceptable **cóng yòu*, even though *cóng* 'from' is synonymous with *zì* in this usage, as is seen in another phrase *cóng xiǎo* 'from childhood' in the following sentence.

(15) Tā cóng/*zì xiǎo/wǔshuì de shíhòu kāishǐ xué shìjièyǔ.
he from small/five-year DE time begin study Esperanto
'He started studying Esperanto since he was a child/five years old.'

One thing is sure now: when it comes to denote source preverbally, *zì* is no longer available in contemporary Chinese.

A.1.4. Goal *yǔ*:

The world *yǔ* 'to'used to have the same meaning as contemporary *gěi* '(to give) to', as is shown in the following examples.

(16) Liú Bèi zèng jiàn yǔ Guān Yǔ.
Liu Bei award sword to Guan Yu
'Liu Bei awarded Guan Yu with a sword.'

(17) Qiè bù rěn jiā hài yǔ nǐ, gù wéi.
I not tolerate add harm to you thus do
'I didn't want to see you get hurt. That's why I did what I did.'

In contempoary Chinese, the prepositional use of *yǔ* has disappeared. In its place we find the Case marker *gěi* which is used preverbally. Examine the following.

(18) a. Liú Bèi gěi/*yǔ Guān Yǔ zèngsòng-le yì-bǎ jiàn .
Liu Bei to Guan Yu award-give-PER one-CL sword
'Liu Bei awarded Guan Yu with a sword.'

b. *Liú Bèi zèngsòng-le yì-bǎ jiàn yǔ Guān Yǔ.
Liu Bei award-give-PER one-CL sword to Guan Yu

In (18a) we see that in preverbal position, only *gěi* is now possible to denote dative case, and (18b) shows that *yǔ* is no longer available to introduce a postverbal dative phrase. Thus we see the loss of another preposition during the development of the Chinese language.

A.1.5. Destination *zhì*:

When it comes to denote destination in space or time, *zhì* is always used in archaic Chinese. Examine the following.

(19) Dài chuán xíng zhì Guǎnglín, zài shuō bù chí.
wait boat go until Guamglin then talk not late
'It is not too late to talk (about it) when the boat reaches Guanglin.'

(20) Zhì chūn, guǒ bìng. Zhì sì yuè, xiè xué sǐ.
until spring indeed ill until four month release blood die
'In spring, (he) indeed fell ill. In April, (he) spit blood and died.'

In (19) *zhì* introduces the destination of the trip by boat, and in (20) it is the time. This denotion is now replace by the verb *dào* 'arrive at/reach', as can be seen in the contemporary version in the following.

(21) Děng chuán dào-le Guǎnglín, wǒmen zài tán zhè-jiàn shì.
wait boat arrive-PER Guanglin we then talk this-CL matter
'We will not talk about the matter until our boat reaches Guanglin.'

(22) Dàole chūntiān, tā guǒran bìngle. Dàole sìyuè, tā tù xué
reach-PER spring he indeed ill-PER reach-PER April he spit blood
ér sǐ.
and die
'When it reached spring, he indeed fell ill. When it was April, he spit blood and died.'

The paraphrases in (21) and (22) indicate that the function of the archaic preposition *zhì* is now replaced by a verb. One thing worth noting in (20) is the preverbal use of the prepositional phrase. As can be seen from the punctuation, this preverbal *zhì* phrase is used contrastively and occupies the topic position.

A.2. Possible Prepositions in Contemporary Chinese

I have argued that most of the so-called coverbs have lost their verbal functions if they were used as verbs. They are also shown to be different from prepositions. Actually, I have argued that they are case markers in contemporary Chinese. Now the natural question would be if there are any true prepositions in Chinese now. We have seen in the previous discussions some brief mention of the word *bèi* as a possible candidate for a (non-case marking) preposition. In this section I will have a closer look at this possibility.

A.2.1. The Word *bèi*

The word *bèi* is a passive indicator. It either introduces the agent phrase as in (23) or indicates that the verb is in its passive form as in (24).

(23) Shūbāo bèi nèi-ge rén fàngzài-le dìshàng.
bookbag by that-CL person put-at-PER floor-top
'The bookbag was put on the floor by that person.'

(24) Shūbāo bèifàngzài-le dìshàng.
bookbag BEI-put-at-PER floor-top
'The bookbag was put on the floor.'

In (23) the word *bèi* introduces an NP *nèi-ge rén* 'that person' that serves as the agent of the action and in (24) the prefix *bèi* is attached to the verb to indicate the passive form. Note that *bèi* has different functions in the above examples. That is, it is an independent word in (23) but it is not in (24). This is because *bèi* in (24) cannot be separated from the verb stem by any lexical items. This is shown in the following.

(25) Shūbāo bèi xiān jìnlai de nèi-ge rén qiāoqiāode fàngzài-le
bookbag by earlier enter-come REL that-CL person quietly put-at-PER
dìshàng.
floor-top'
The bookbag was quietly put on the floor by that person whom came in earlier.'

(26) *Shūbāo bèi qiāoqiāode fàngzài-le dìshàng.
*bookbag BEI quietly put-at-PER floor-top
Intended: 'The bookbag was quietly put on the floor.'

Since both cases involve passive sentences, we will look at the historical development of passives first.

A.2.1.1. Historic Background

In archaic Chinese, *bèi* is not the only word/morpheme that could form a passive sentence. Other words such as *jiàn*, *yǔ*, *shòu*, and *gěi* were also used in passives. Examine the following.

(27) Xìn er jiàn yí, zhōng er bèi bàng, néng wú yuàn hu.
trust but PAS suspect loyal but PAS slander can no complaint Q
'How can there be no complaints when those who can be trusted are suspected and those who are loyal are slandered?'

(28) Wèi Huì wáng bīng shù pò yú Qí Qín.
Wei Hui king army several defeat by Qi Qin
'King Hui of Wei's army was defeated several times by (king of) Qi and (king of) Qin('s army).'

(29) Qín yǔ tiānxià jù bà, ze lìng bù héng xíng yú
Qin by sky-under all disappoint thus decree not across carry-out at
Zhōu ye.
Zhou YE
'Qin is disappointed by all. Thus its decree is no longer carried out in Zhou.'

(30) Zhìhēng bèi Wèi Wǔ zhé wéi gǔ lì.
Zhiheng by Wei Wu relegate as drum official
'Zhiheng was relegated by (King) Wu of Wei to a drummer.'

(31) Dēng qí líng, sì wàng wú yǔ zhàng zhe.[2]
climb its peak four look nothing by block ZHE
'(After) climbing to the (mountain's) top, (we) looked in four directions (and found our view) was blocked by nothing.'

As we can see from the above examples, in archaic Chinese there are also two groups of words in passive sentences. One group such as *jiàn*, *bèi*, and *shòu* is used to form passive verbs and another group such as *yǔ*, *wéi*, and *bèi* are used to introduce the agent phrase so that passives are formed. Note that *bèi* belongs to both groups in (27) and (30). During the development to modern Chinese, some of these passive markers lost such function, such as *yǔ*, *jiàn*. Some resume the function but have become verbs such as *shòu*. Only *bèi* remain both passive verbal morpheme and agent marker.[3] Examine the following contemporary passives.

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[2] Note in this example that the preposition *yǔ* is stranded. The object of the preposition is *wú* 'nothing' and this negative pronoun is placed before the preposition. This shows that in archaic Chinese a preposition can be stranded, just as the verbs do.

[3] Another word *gěi* also survives as a passive marker, but only in some dialects and is basically limited in informal (oral) usage.

(i) Zhāngsān gěi Lǐsì tī-le yì jiǎo.
Zhangsan by Lisi kick-PER one foot
'Zhangsan was kicked (once) by Lisi.'

It is pointed out to me that the word *ràng* (possibly the word *jiào*, too) can also denote passives in the following example.

(ii) Nèi-zhī bǐ ràng/jiào wǒde xiǎo dìdi gěi-rēng-le.
that-CL pen RANG/JIAO my little brother GEI-throw-PER
'That pen was thrown away by my little brother.'

(32) Wèi Huǐ wáng de jūnduì duōcì bèi/*yú Qíguó hé Qínguó de
Wei Hui king DE army several-CL by Qi-state and Qin-state DE
jūnduì dàbài.
army defeat.
'King Hui of Wei's army was defeated by Qi and Qin's army several times.'

(33) Xiǎoming zài xuéxiào shòu-le (lǎoshī de) pīpíng.
Xiaoming ZAI school get-PER teacher DE criticize
'Xiaoming was criticized (by his teacher) in school.'

(34) Xiǎoming zài xuéxiào bèi(*-le) lǎoshī pīpíng-le.
Xiaoming ZAI school BEI-PER teacher criticize-PER
'Xiaoming was criticized by his teacher in school.'

(35) Xiǎoming zài xuéxiào bèi-pīpíng-le.
Xiaoming ZAI school BEI-criticize-PER
'Xiaoming was criticized in school.'

Thus (32) shows that the archaic agent marker *yú* is now replaced by *bèi* and the phrase is no longer placed postverbally. The fact that *shòu* can be inflected with le in (33) shows that *shòu* is now used as a verb. The word *bèi* is used as a agent marker in (34) and a passive marker in (35).

A.2.1.2. Comparison with Case Markers

We have seen that *bèi* can be an agent marker or a passive verbal morpheme in contemporary Chinese. The two different uses of *bèi* cannot both appear in the same sentence.[4] Examine the following.

(36) *Xiǎoming zài xuéxiào bèi lǎoshī bèi-pīpíng-le.
Xiaoming ZAI school BEI teacher criticize-PER

The use of *bèi-* before the verb is generally treated as the passive verbal prefix in Chinese. It is attached before a verb to form the passive voice, as is the case in (35). We will distinguish the passive marker as *bèi-*.The use of *bèi* before a nominal phrase is generally known as an agent marker, by which we mean that *bèi* is always used to introduce an agent phrase of the sentence. It is in this sense that a sentence with a *bèi*-phrase is regarded as the passive voice even if the verb is not marked by the passive morpheme. Compared with other case markers such as *bǎ*, which always introduces an affected theme, or *zài*, which always introduces a locational complement, *bèi* has some apparent similarities in its syntactic behavior. For instance, both *bèi* and other case markers must appear to the left of the phrase they introduce and the phrase they mark must appear between the subject and the verb. Examine the following.

[4] The reason that the two *bèi*'s cannot both appear in the same clause is generally attributed to the haplology constraint in Chinese (Li 1985).

(37) Píngguǒ bèi Xiǎoming yòng xiǎo dāo bǎ pí xuē-le.
Apple by Xiaoming YONG small knife BA skin peel-PER
'The apple was peeled by Xiaoming with a small knife.'

(38) Nèi-pén huā bèi Xiǎoming cóng wūwài bāndào-le
that-pot flower by Xiaoming CONG house-outside move-to-PER
yángtái-shàng.
balcony-top
'The pot of flowers has been moved by Xiaoming from outside to the balcony.'

Even though *bèi* sometimes introduces an agent phrase, it cannot be analyzed as a case marker because the *bèi*-phrase displays some significant syntactic differences from other marked complements.

First, please note that the *bèi*-construction does not follow the direct mapping principle discussed earlier in this paper. Recall that I argued that there is a direct corelation between the argument hierachy and the linear order of the sentence structure in Chinese. That is, the most agent-like argument on the argument list of the verb must be selected to take the subject position and the most patient-like argument takes the object position if the verb is transitive. Then the rest will be treated as marked complements and take preverbal positions. If the *bèi*-phrase were treated as a marked complement, then this arrangement will be violated. Examine the following.

(39) Zhuōzi-shàng bèi Xiǎomíng bǎi-le yī-béng huā.
table-top by Xiaoming place-PER one-pot flower
'A pot of flower was placed on the table by Xiaoming.'

Note that in (39) the NP *Xiǎomíng* in the *bèi*-phrase is the most agent-like argument in the sentence but it is not selected as the subject. Instead, the locative *zhuōzi-shàng* 'on the table' is taken as the subject. This arrangement does not follow the direct mapping principle in Chinese. Thus the *bèi*-phrase does not behave like other marked complements.

Second, I have argued earlier that a possessive pro in the object must be o-bound by the next less oblique coargument. Thus in (40), the marked complement serves as the binder for the pro in the object NP *yī-tiáo tuǐ* 'a leg' and therefore we understand that the broken leg belongs only to Zhangsan, not to Xiaoming.

(40) Xiǎomíng$_i$ bǎ Zhāngsān$_j$ shuāiduàn-le pro*$_{i/j}$ yī-tiáo tuǐ.
Xiaoming BA Zhangsan throw-break-PER one-CL leg
'Xiaoming has broken one of Zhangsan's legs.'

(41) Xiǎomíng$_i$ bèi Zhāngsān$_j$ shuāiduàn-le pro$_{i/*j}$ yī-tiáo tuǐ.
Xiaoming by Zhangsan throw-break-PER one-CL leg
'Xiaoming has broken one of Zhangsan's legs.'

However, in (41) the *bèi*-phrase cannot serve as the binder for *yī-tiáo tuǐ* 'a leg' in the object position even though it occupies the preverbal position. Instead, the NP in the

subject position is taken to be the binder. In the following sentences, the *bèi*-phrase cannot serve as the binder for the pro', either. But note that other marked complements can.

(42) Jǐngchá$_i$ bǎ xiǎotōu$_j$ xiàpǎo-le sān-ge pro'$_{*i/j}$.
policeman BA pickpocket scare-run-PER three-CL
'The cops scared away three of the pickpockets.'

(43) Jǐngchá$_i$ bèi xiǎotōu$_j$ xiàpǎo-le sān-ge refo$_{i/*j}$.
policeman by pickpocket scare-run-PER three-CL
'Three of the cops were scared away by the pickpockets.'

Again, this shows that the *bèi*-phrase should not be treated as the marked complement of the sentence.

The third piece of evidence against treating the *bèi*-phrase as a marked complement comes from the fact that it cannot scramble with other marked complements. As noted earlier, sometimes we can have more than one marked complement within the same clause. When this happens, those complements can scramble among themselves. Examine the following sentences.

(44) a. Zhāngsān cóng jiā-lǐ bǎ Xiǎomíng gǎn-le chūlái.
Zhangsan CONG home-inside BA Xiaoming chase-PER out-come
'Zhangsan has driven Xiaoming out of the home.'

b. Zhāngsān bǎ Xiǎomíng cóng jiā-lǐ gǎn-le chūlái.
Zhangsan BA Xiaoming CONG home-inside chase-PER out-come
'Zhangsan has driven Xiaoming out of the home.'

(45) a. Xiǎomíng yòng dīngzi zài qiáng-shàng guà-le yí-fù huà.
Xiaoming YONG nail ZAI wall-top hang-PER one-CL painting
'Xiaoming has hung a painting on the wall with nails.'

b. Xiǎomíng zài qiáng-shàng yòng dīngzi guà-le yí-fù huà.
Xiaoming ZAI wall-top YONG nail hang-PER one-CL painting
'Xiaoming has hung a painting on the wall with nails.'

Thus the source *cóng*-phrase and theme *bǎ*-phrase can switch their positions in (44), and so can the instrumental *yòng*-phrase and the locative *zài*-phrase in (45). However, a *bèi*-phrase does not enjoy the scrambling.

(46) a. Qiáng-shàng bèi Xiǎomíng yòng dīngzi guà-le yí-fù huà.
wall-top by Xiaoming YONG nail hang-PER one-CL painting
'A painting was hung on the wall by Xiaoming with nails.'

b. *Qiáng-shàng yòng dīngzi bèi Xiǎomíng guà-le yí-fù huà.
wall-top YONG nail by Xiaoming hang-PER one-CL painting
Intended: 'A painting was hung on the wall with nails by Xiaoming.'

(47) a Júzi bèi Xiǎoming bǎ pí bō-le.
Orange by Xiaoming BA skin peel-PER
'The orange was peeled by Xiaoming.'

b *Júzi bǎ pí bèi Xiǎoming bō-le.
Orange BA skin by Xiaoming peel-PER

If the *bèi*-phrase is treated as another marked complement, its different behavior towards scrambling cannot be explained.

A.2.1.3. Similarities between *bèi* and the Locative Endings

The non-binding facts of *bèi*-phrase resembles the locative phrases discussed in Chapter 5, where, in contrast to nominal phrases, locative phrases were shown not to be potential binders for a possessive pro in a more oblique coargument. Below are some more examples showing this phenomenon.

(48) a. Xiǎomíng$_i$ bǎ dèngzi$_j$ shuǎiduàn-le pro$_{*i/j}$ yì-tiáo tuǐ.
Xiaoming BA stool throw-break-PER one-CL leg
'Xiaoming threw the stool and broke one of its legs.'

b. Xiǎomíng$_i$ zài dèngzi-shàng$_j$ shuǎiduàn-le pro$_{i/*j}$ yì-tiáo tuǐ.
Xiaoming BA stool-top throw-break-PER one-CL leg
'Xiaoming broke one of his legs on the stool.'

Thus in (48a) we know that the broken leg belongs to the stool since the *bǎ*-phrase can serve as the binder of the the pro in the object NP. However, the *zài*-phrase in (48b) cannot bind the pro, therefore the NP in the subject position has to be the potential binder. We have attributed the non-binding phenonemon in (48b) to the non-compatibility of the categories of the binder and the bindee. That is, in order for a less oblique coargument to bind an anaphoric expression, the binder and the anaphor must also belong to the same syntactic category. In (48b), the *zài*-phrase is an LP and the anaphoric expression pro is an NP, hence the inability of the *zài*-phrase to bind the pro.

The inability of *bèi*-phrase to bind the pro in (41) can be explained in the same way if we assume that *bèi* is not a case marker, but a lexical category that heads a projection that is different than an NP.

A.2.1.4. The Syntactic Status of*bèi*-phrase

We have seen that *bèi*-phrase behaves differently from marked complements. Its similarity in binding ability with locative phrases suggests that it should be treated as a category other than an NP. Since *bèi* has been used as a preposition through earlier stages of the language, I suggest that in contemporary Chinese, *bèi* is still a preposition which heads a prepositional phrase. Its optional appearance in the sentence also suggests that it is not a complement, but an adjunct modifier of the verb phrase. With the adjunct prepositional phrase status, the behavior of *bèi*-phrase discussed earlier now can be explained.

First, since a *bèi*-phrase is not a complement, it is not on the argument list of the verb and therefore it is not involved in the direct mapping from the argument hierarchy and the linear order in the phrase structure of the sentence.

Second, since a *bèi*-phrase is now treated as an adjunct PP, not an argument in the sentence, it is not expected to participate in the binding relations where arguments are required. This can explain why a *bèi*-phrase is not a potential binder for the pro in the object position in (41). Besides, since *bèi* is treated as a preposition heading a prepositional phrase, there is the categorial compatibility requirement that also prevents *bèi*-phrase from being a potential binder to an anaphoric NP expression.

Third, the scrambling phenomenon seen in (44) and (45) is said to happen only with members from the same syntactic domain (the MCOMPS list) Since we assume a flat structure for the VP, this domain is set to preverbal arguments only. Thus only marked complements participate in the scrambling. Since the *bèi*-phrase is not a marked complement but an adjunct, it is always generated outside the VP. Thus we always expect it to appear before all the marked complements, not after them. This explains the unacceptibility of the (b) sentences in (46) and (47) where the *bèi*-phrase is placed between the verb and the marked complement.

Therefore we conclude that *bèi* is best analyzed as a preposition in Chinese.

A.2.1.5. Other Issues on *Bèi*:

Since *bèi* is now treated as a preposition in Chinese, other behaviors of *bèi* may also be explained. First, we notice that *bèi*, like case markers in Chinese, cannot be stranded. That is, topicalization or relativization is not possible with the NP introduced by *bèi*. This is expected since *bèi*-phrase is an adjunct modifier. Generally, topicalization and relativization are not allowed within an adjunct modifier. Examine the following.

(49) a. Zhāngsān dú xiǎoxué de shíhòu, tā gēge yǐjing dàxué
Zhangsan read E school DE time he older bro already university
bíyè-le.
graduate-PER
'When Zhangsan was in elementary school, his brother had already graduated from university.'

b. *Xiǎoxué, Zhāngsān dú de shíhòu, tā gēge yǐjing dàxué
E school Zhangsan read DE time he o.b. already university
bíyè-le.
graduate-PER
Intended: '*The elementary school, when Zhangsan was in, his older brother had already graduated from university.'

c. *Zhāngsān dú de shíhòu, tā gēge yǐjing dàxué bíyè-le de
Zhangsan read DE time he o.b. already univ. graduate-PER REL
xiǎoxué.
elementary school
Intended: '*The elementary school that when Zhangsan was in, his older brother had already graduated from university.'

Compare: d. Zhāngsān dú-le sānnián xiǎoxué.
Zhangsan read-PER three-year E. school
'Zhangsan was in elementary school for three years.'

e. Xiǎoxué, Zhāngsān dú-le sānnián.
E. school Zhangsan read-PER three-year
'As for elementary school, Zhangsan was there for three years.'

f. Zhāngsān dú-le sānnián de xiǎoxué.
Zhangsan read-PER three-year REL E. school
'the elementary school that Zhangsan was in for three years'

Thus, (49d-f) show that topicalization and relativization of an object NP is possible. However, if this object NP is within an adjunct expression, as is the case in (49a-c), topicalization or relativization is no longer possible. Therefore if we treat *bèi*-phrase as an adjunct, then we predict that the NP after *bèi* is not topicalizable or relativizable. The following examples show that this prediction is borne out.

(50) a. Dèngzi bèi Xiǎomíng shuǎiduàn-le yī-tiáo tuǐ.
stool by Xiaoming throw-break-PER one-CL leg
'The stool was thown and one of its legs was broken by Xiaoming.'

b. *Xiǎomíng, dèngzi bèi shuǎiduàn-le yī-tiáo tuǐ.
Xiaoming stool by throw-break-PER one-CL leg
Intended: '*Xiaoming, the stool was thown and one of its legs was broken by.'

c. *Dèngzi bèi shuǎiduàn-le yī-tiáo tuǐ de Xiǎomíng.
stool by throw-break-PER one-CL leg REL Xiaoming
Intended: 'Xiaoming, by whom the stool was thown and one of its legs was broken.'

Not only is a *bèi*-phrase an adjunct, it is also restricted to a VP adjunct. This is because the *bèi*-phrase can only appear between the subject and the VP. It cannot appear before the subject, like some sentential adjuncts such as *míngtiān* 'tomorrow', *xiǎoshíhòu* 'during childhood', etc. Examine the following.

(51) a. Nèi-ge xīguā bèi Xiǎomíng shuǎichéng-le liǎngbàn.
that-CL watermelon by Xiaoming throw-become-PER two-half
'The watermelon was broken in halves by Xiaoming.'

b. *Bèi Xiǎomíng nèi-ge xīguā shuǎichéng-le liǎngbàn.
by Xiaoming that-CL watermelon throw-become-PER two-half

(52) a. Xiǎomíng míngtián yào qù Běijīng.
Xiaoming tomorrow want go Beijing
'Xiaoming want to go Beijing tomorrow.'

b. Míngtián Xiǎomíng yào qù Běijīng.
tomorrow Xiaoming want go Beijing
'Xiaoming want to go Beijing tomorrow.'

(53) a. Xiǎomíng xiǎoshíhòu xǐhuān dǎ lánqiú.
Xiaoming childhood time like play basketball
'Xiaoming enjoyed playing basketball when he was a child.'

b. Xiǎoshíhòu Xiǎomíng xǐhuān dǎ lánqiú.
childhood time Xiaoming like play basketball
'Xiaoming enjoyed playing basketball when he was a child.'

A.2.2. Other Possible Prepositions in Chinese

We have shown that the word *bèi* is best analyzed as a preposition in contemporary Chinese. It combines with an (agentive) NP to form a prepositional phrase functioning as an adjunct modifier for verb phrases. Thus a prepositional phrase is syntactically different from a marked complement. If this is the difference between a marker and a preposition in Chinese, then there are other possible prepositions in Chinese. We will have a very brief discussion of some of them.

First we have a time-denoting *yú* from archaic Chinese usage. The preposition usage of *yú* combines with a time expression to form a VP adjunct, as is shown in the following.

(54) Lái-xìn (yú) zuótiān xiàwǔ shōudào-le.
come-letter at yesterday afternoon receive-arrive-PER
'The letter (to me) was received yesterday afternoon.'

(55) Tāmen (yú) jīnnián chūntiān zài Hángzhōu jié-le hūn.
they in this-year spring ZAI Hangzhou tie-PER marriage
'They got married in Hangzhou last spring.'

However, the *yú*-phrase is usually used only in formal speech. Nowadays people are comfortable with phrases without *yú* which now seems to function as a sentential modifier as well.

(56) (*Yú) zuótiān xiàwǔ lái-xìn shōudào-le.
at yesterday afternoon come-letter receive-arrive-PER
'The letter (to me) was received yesterday afternoon.'

(57) (*Yú) jīnnián chūntiān Tāmen zài Hángzhōu jié-le hūn.
in this-year spring they ZAI Hangzhou tie-PER marriage
'They got married in Hangzhou last spring.'

Thus, even though *yú* may still be a preposition, it is no longer very active in contemporary Chinese.

Next, we consider the preposition *yǐ* 'according to', which may have come from the same instrumental *yǐ* in (2). The use of *yǐ* to introduce an instrumental NP has now been replaced with the marker *yòng*, but *yǐ* meaning *according to* seems to linger on. Examine the following sentences.

(58) Yǐ xiànzài de sùdù, wǒmen tiānhēi cái néng dào jiā.
according to present DE speed we sky-dark just can reach home
'At the present speed, we can reach home only after dark.'

(59) Yǐ dàodá xiānhòu wéi xù.
according to arrival early-late serve as order
'In order of arrival.'

The meaning according to can also be expressed with verbs such as *zhào* as in *zhào húlu huà piáo* 'draw a dipper according to the gourd', *àn(zhào)*, as in *àn(zhào) shàngji de zhǐshí* 'according to the instructions of the superior', and *yǐ* as in *yǐ wǒ de lǐjiě* 'according to my understanding'. However, those words can be inflected with verbal morphemes as as *-zhe* or *-le* and therefore should not be treated as prepositions. We still treat *yǐ* as a preposition because it cannot be inflected and it cannot function as a predicate.

Li and Thompsom (1981) have discussed a list of (possible) coverbs/prepositions in contemporary Chinese. However, some of their prepositions like *bǎ*, *cóng*, *zài*, etc. are classified as (Case) markers in this paper. Other prepositions such as *wèi*, *zhào*, *cháo*, etc. are treated as verbs because they can form predicates by themselves and can be inflected with aspect morphemes such as *-zhe*, *-le*, and *-guò*. Thus the most likely candidate for a preposition still seems to be *bèi*. Other possible candidates are archaic prepositions such as *yǔ*, *yǐ*, etc. However, since those prepositions are most likely to appear in formal speech, they seem to be in the process of becoming obsolete in comtemporary Chinese. If we assume that Chinese is undergoing the change from SVO to SOV, this phenomenon is expected.

REFERENCES

Abney, Steven Paul 1987. *The English Noun Phrase in its Sentential Aspect.* Doctoral Dissertation, MIT.

Aoun, J. and D. Sportiche 1981. On the Formal Theory of Government. *Linguistic Review* 2:211-36

Bach, Emmon and Robert Harms (eds.) 1968. *Universals in Linguistic Theory.* New York: Holt, Rinehart & Winston.

Baker, Mark C. 1988. *Incorporation.* Chicago: University of Chicago Press.

Barker, Chris and David Dowty 1992. Non-Verbal thematic Roles. *NELS 23.*

Bennett, Paul A. 1981. The Evolution of Passive and Disposal Sentences. *Journal of Chinese Linguistics* 9:61-90.

Borsley, Robert D. 1991. *Syntactic Theory: a Unified Approach.* London: Edward Arnold.

Burzio, L. 1986. *Italian Syntax: A Government-Binding Approach.* Reidel: Dordrecht.

Chafe, Wallace L. 1976. Givenness, Contractiveness, Definiteness and Subject. In Charles Li (ed.)

Chao, Yuanren 1968. *A Grammar of Spoken Chinese.* Berkeley: University of California Press.

Chang, Claire Hsun-Huei 1989. Compounds in Mandarin Chinese with Special Emphasis on Resultative Verb Compounds. *Working Papers in Linguistics, University of Hawaii,* 20:59-84.

Chang, Liping 1990. Locative Inversion in Mandarin Chinese: the Linking between Themantic Roles and Grammtical Functions. Master Thesis, Fu Jen Catholic University.

Cheng, Lisa L-S 1991. *On the Typology of Wh-Questions.* Doctoral Dissertation, MIT.

Cheung, Hung-nin Samuel 1973. A Comparative Study in Chinese Grammar: The BA-Construction. *Journal of Chinese Linguistics,* 1:343-82.

Chomsky, Noam (1981). *Lectures on Government and Binding.* Dordrecht: Foris.

____ 1986a. *Knowledge of Language: Its Nature, Origin, and Use.* New York: Praeger.

____ 1986b. *Barriers.* Cambridge, MA: MIT Press.

____ 1991. Some Notes on Economy of Derivation and Representation. In Robert Freidin (ed.) *Principles and Parameters in Comparative Grammar.* Cambridge, MA: MIT Press.

____ 1992. A Minimalist Program for Linguistic Theory. *MIT Occasional Papers in Linguistics 1.* Cambridge, MA.

Chung, Chan 1993. A Lexical Approach to Inalienable Possession Construction in Korean. In Andreas Kathol and Carl Pollard (eds) *Papers in Syntax.* The Ohio State University.

____ 1997. *A Lexical Approach to Word Order Variation in Korean.* Doctoral Dissertation, the Ohio State University.

Cole, Peter and Jerrold Sadock (eds.) 1977. *Syntax and Semantics.* New York: Academic Press.

Culicover, Peter 1992. Topicalization, Inversion, and Complementizers in English. Fifth Symposium on Comparative Grammar. *OTS Working Papers: Going Romance and beyond.* Utrecht: University of Utrecht.

Dai, John X-L. (1991). Inflectional Morphology in Chinese. *Peper Presented at the Third North American Conference on Chinese Linguistics.* Cornell University, May 3-5, 1991.

____ 1992. *Chinese Morphology and Its Interface with Syntax.*. Doctoral Dissertation, the Ohio State University.

Ding, Dan 1994. BA-Construction as a Causative Construction. Paper presented at *NACCL 6,* University of Southern California, Los Angeles.

Dowty, David 1979. *Word Meaning and Montague Grammar.* Dordrecht: Kluwer.

____ 1991. Thematic Proto-Roles and Argument Selection *Language* Vol 67:547-619.

Fillmore, Charles 1968. The Case for Case. In Emmon Bach and Robert Harms (eds.).

____ 1977. The Case for Case Reopened. In Peter Cole and Jerrold Sadock (eds.)

Fukushima, Kazuhiko 1999. A Lexical Comment on a Syntactic Topic. In Robert D Levine and Georgia M Green (eds.) *Studies in Comtemporary Phrase Structure Grammar.* Cambrigde University Press

Gao, Qian 1989. Object-Fronting in Mandarin Chinese. ms. University of Pittsburgh.

____ 1991. Resultative Verb Compounds and the Ba-Construction in Mandarin Chinese. Master Thesis, University of Pittsburgh (in Gail Coelho and Daniel L. Everett (eds.) *University of Pittsburgh Working Papers in Linguistics Vol. 2, 1993*:1-25).

____ 1992. Chinese Ba Construction: Its Syntax and Semantics. Unpublished manuscript, the Ohio State University.
____ 1993. Tense and Aspect in Chinese. Paper presented at *NACCL 5*, University of Delaware, Newark.
____ 1994a. Focus Criterion: Evidence from Chinese. Paper presented at *NACCL VI*. Los Angeles: University of Southern California.
____ 1994b. Chinese NP Structure. *Linguistics* 32:475-510.
____ 1995. Against Lexical Rules: Two Case Studies in Chinese. Paper presented at *NACCL 7*, University of Wisconsin, Madison.
____ 1996. Resultative Verb Compounds and BA-Constrution in Chinese. *Journal of Chinese Linguistics* Vol. 25:84-130.
Goodall, 1989. Evidence for an Asymmetry in Argument Structure. *Linguistic Inquiry* 20: 669-74.
Grimshaw, Jane 1987. Unaccusatives: An Overview. *Proceedings of NELS 17*. GLSA, University of Massachusetts, Amherst.
____ 1990. *Argument Structure*. Cambridge, MA: MIT Press.
____ 1991. Extended Projection. ms. Brandeis University.
____ 1997. Projection, Heads, and Optimality. *Linguistic Inquiry* 28:373-422.
Gunji, 1987. *Japanese Phrase Structure Grammar*. Dordretch Reidel.
Haiman, John (ed.) 1985. *Iconicity in Syntax*. Philadelphia: Jonh Benjamins.
Hashimoto, Anne Y. 1964. Resultative Verbs and Other Problems. *POLA*, 8.
Hashimoto, Mantaro J. 1988. The Structure and Typology of the Chinese Passive Construction. In Masayoshi Shibatani (ed.).
Her, One-Soon 1991. Topic as a Grammatical Function in Chinese. *Lingua* 84:1-23.
Hooper, Paul and Sandra Thompson (1980). Transitivity in Grammar and Discourse. *Language* 56:251-299.
Hsueh, Frank F-S. 1989. The Structure Meaning of Ba and Bei Constructions in Mandarin Chinese: Do They Really Mean Disposal and Passive? In James H-Y. Tai and Frank F-S. Hsueh (eds.) *Functionalism and Chinese Grammar*. (Chinese Language Teachers Association Monograph Series No.1)
Huang, C-R 1989. Subcategorized Topics in Mandarin Chinese. Paper presented at the 1989 CLTA Annue Meeting, November 17-19, Boston, MA.
____ 1991. Mandarin Chinese and the Lexical Mapping Theory: A Study of the Interaction of Morphology and Argument Changing. *Bulletin of the Institute of History and Philosophy* 62.

Huang, C-R and Fu-Wen Lin 1993. Composite Event Structures and Complex Predicates: A Template -based Approach to Argument Selection. In Laurel Smith Stvan et al. (eds.): *Papers from FLSM III*:90-108. Bloomington, IN: IULC.
Huang, James C-T 1982. *Logical Relations in Chinese and the Theory of Grammar*. Doctoral Disertation, MIT.
____ 1984. On the Distribution and Reference of Empty Pronouns. *Linguistic Inquiry* 15:531-74.
____ 1987. Existential Sentences in Chinese and Indefiniteness. In Eric Reuland and Alice ter Meulen (eds.).
____ 1989a. Pro-Drop in Chinese: A Generalized Control Theory, in Svaldo Jaeggli & Kenneth J. Safir (eds.).
____ 1989b. Complex Predicates in Generalized Control. MIT Workshop on Control.
____ 1991. Verb Movement, (In)definiteness, and the Thematic Hierarchy. *Proceedings of the Second International Symposium on Chinese Languages and Literatures*. Taipei: Academia Sinica.
Jackendoff, Ray 1972. *Semantic Interpretation in generative Grammar*. Cambridge, MA: MIT Press.
____ 1987. The Status of Thematic Relations in Linguistic Theory. *Linguistic Inquiry* 18:369-411.
____ 1990. *Semantic Structures*. Cambridge, MA: MIT Press
Jaeggli, Svaldo, and Kenneth J. Safir (eds.)1989. *The Null Subject Parameter*. Dordrecht: Kluwer.
Jiang, Zixin 1991. *Some Aspects of the Syntax of Topic and Subject in Chinese*. Doctoral Disertation, University of Chicago.
Joseph, Brian and Jane Smirniotopoulos 1993. The Morphosyntax of the Modern Greek Verb as Morphology and not Syntax. *Linguistic Inquiry* 24:388-98.
Kitagawa, Y. 1986. *Subject in Japanese and English*. Doctoral Dissertation, University of Massachusetts at Amherst.
Koopman, Hilda and Dominique Sportiche 1985. Theta-Theory and Extraction. Paper presented at the 1985 *GLOW* meeting, Brussels.
____ and ____ 1991. The Position of Subjects. *Lingua* 85:211-58.
Kuno, Susumu 1973. *The Structure of the Japanese Language*. Cambridge, MA: MIT Press.
LoPolla, Randy 1990. *Grammatical Relations in Chinese: Synchronic and Diachronic Considerations*. Doctoral Dissertation, University of California at Berkeley.

Larson, R. 1988. On the Double Object Construction. *Linguistic Inquiry* 19:335-91.

Lee, Kai-fat 1976. Polysyllabicity in the Modern Chinese Verb: An Attempt to quantify a Linguistic Drift. *Journal of Chinese Linguistics*, 4:50-78.

Li, Audrey 1985. *Abstact Case in Chinese*. Doctoral Dissertation, University of Southern California.

____ 1990. *Order and Constituency in Mandarin Chinese*. Dordrecht: Kluwer.

Li, Charles (ed.) 1976. *Subject and Topic*. New York: Academic Press.

Li, Charles and Sandra A. Thompson 1973. Serial Verb Construction in Mandarin Chinese. *Chicago Linguistic Society* 9:96-103.

____ and ____ 1974. Co-verbs in Mandarin Chinese: Verbs or Prepositions? *Journal of Chinese Linguistics* 2:257-78.

____ and ____ 1976. Evidence against Topicalization in Topic Prominent Languages, in Charles Li (ed.).

____ and ____ 1981. *Mandarin Chinese: A Functional Reference Grammar*. Berkeley: University of California Press.

Li, Ya-Fei 1990. On V-V Compounds in Chinese. *Natural Language and Linguistic Theory* 8:177-207.

____ 1992. Causer, Causee, and Resultative Constructions in Chinese. Paper presented at *NACCL 4*, University of Michigan, Ann Arbor.

____ 1993. Structural Head and Aspectuality. *Language* 69:480-504.

Li, Ying-Che 1974. What does Disposal Mean? Features of the Verbs and Noun in Chinese. *Journal of Chinese Linguistics* 2:200-218.

Lin, Fu-wen 1989. The Verb-Complement (V-R) Compounds in Mandarin Chinese. *Proceedings of ROCLING*, 2:251-76.

Liu, Feng-hsi 1993. Aspect and BA Sentences in Chinese. In Laurel Smith Stvan et al. (eds.): *Papers from FLSM III*:90-108. Bloomington, IN: IULC

___ 1994. A Note on Clitics and Affixes in Chinese. *NACCL* 6:137-43.

___ 1998. A Clitic Analysis of Locative Particles. *Journal of Chinese Linguistics* 26: 48-70.

Lu, John H-T. 1977. Resultative Verb Compounds vs. Directional Verb Compounds in Mandarin. *Journal of Chinese Linguistics*, 5:276-313.

Lü, Shuxiang 1956. *Zhongguo Wenfa Yaolui*. Shanghai: Commercial Press.

Ma, Jianzhong 1898 (reprinted in 1954). *Ma's Grammar*. Beijing: Zhonghua Books.

Mei, Kuang 1972. *Studies in the Transformational Grammar of Modern Standard Chinese*. Doctorial Dissertation, Harvard University.

Miyagawa, Shigeru 1988. Unaccusative Verbs in Japanese. *ESCOL 4*. Columbus: the Ohio State University.

____ 1989. Light Verbs and the Ergative Hypothesis. *Linguistic Inquiry* 20: 659-68.

Mulder, Rene and Rint Sybesma 1992. Chinese is a VO language. *Natural Language & Linguistic Theory* 10:439-76

No, Yongkyoon 1991. *Case Alternations on Verb-Phrase Internal Arguments*. Doctoral Dissertation, the Ohio State University.

Pan, Haihua 1992. Argument Structure and Functional Control in Chinese Resultative Compounds. Paper presented at *NACCL 4*, University of Michigan, Ann Arbor.

Perlmutter, D. 1978. Impersonal Passives and the Unaccusative Hypothesis. *Proceedings of the Berkeley Linguistic Society* 4: 157-89.

Pollard, Carl and Ivan Sag 1987. *Information-Based Syntax and Semantics. Vol. 1: Fundamentals*. Stanford: CSLI.

____ and ____ 1992. Anophors in English and the Scope of Binding Theory. *Linguistic Inquiry* 23:261-303

____ and ____ 1994. *Head-Driven Phrase Structure Grammar*. Chicago: University of Chicago Press.

Pollard, Carl and Ping Xue 1998. Chinese Reflexive ziji: Syntactic reflexives vs. Nonsyntactic reflexives. *Journal of East Asian Linguistics* 7:287-318.

Pollock, Jean-Yves 1989. Verb Movement, Universal Grammar and the Structure of IP. *Linguistic Inquiry* 20:365-424.

Radford, Andrew 1988. *Transformational Grammar: a First Course*. Cambridge: Cambridge University Press.

Reuland, Eric and Alice ter Meulen (eds.) 1987. *The Representations of (In)definiteness*. Cambridge: The MIT Press.

Rizzi, Luigi 1991. Residual Verb Second and Wh-Criterion. *Technical Reports in Formal and Computational Linguistics* No. 2. Genève: Faculté des Lettres, Université de Genève.

Roberts, Craige 1996. Information Structure in Discourse: Towards an Integrated Formal Theory of Pragmatics. In Jae-Hak Yoon and Andreas Kathol (eds.) *Papers in Semantics*. The Ohio State University.

Rochemont, Michael S. and Peter W. Culicover 1990. *English Focus Construction and the Theory of Grammar*. Cambridge: Cambridge University Press.

Ross, John Robert 1967. *Constraints on Variables in Syntax*. Doctoral Dissertation, MIT.

Ross, Claudia 1990. Resultative Verb Compounds. *Journal of Chinese Language Teachers Association* 26.3:61-83

Schachter, Paul 1976. The Subject in Philippine Languages: Topic, Actor, Actor-Topic or None of the Above? In Charlels Li (ed.)

Shibatani, Masayoshi (ed.) 1988. *Passive and Voice*. Amsterdam: John Benjamins Publishing Company.

____ 1990. *The Language of Japan*. Cambridge: Cambridge University Press.

Smith, Carlota S. 1991. *The Parameter of Aspect*. Dordrecht: Kluwer.

Tai, H-Y. James 1973. Chinese as an SOV Language. *Papers from the 9th Chicago Linguistic Society* 9:659-671.

____ 1975. On Two Functions of Place Adverbial in Mandarin Chinese. *Journal of Chinese Linguistics* 3:154-179.

____ 1976. Semantics and Syntax of Inner and Outer locatives. *Proceedings of the 1976 Mid-America Linguistics Conference, University of minnesoda.* 393-401.

____ 1985. Temporal Sequence and Chinese Word Order. In John Haiman (ed.).

____ 1994. On the Distinction etween 'Topic' and 'Subject' in Chinese. Paper presented at *NACCL 4, University of Michigan.*

Tang, C-C Jane 1989. Chinese Reflexives. *Natural Language and Linguistic Theory* 7:93-121.

____ 1990a. A Note on the DP Analysis of the Chinese Noun Phrase. Linguistics 28: 337-54

____ 1990b. *Chinese Phrase Structure and the Extended X'-Theory*. Doctoral Dissertation, Cornell University.

Terada, M. 1987. Unaccusativity in Japanese. *NELS 17*. Amherst: University of Massachusetts.

Thompson, Sandra A. 1973a. Resultative Verb Compounds in Mandarin Chinese: A Case for Lexical Rules. *Language,* 49:361-79.

____ 1973b. Transitivity and Some Problems with the ba Construction in Mandarin Chinese. *Journal of Chinese Linguistics,* 1:208-21.

____ 1984. Article in *Language*.

Travis, Lisa 1984. *Parameters and Effects of Word Order Variation.* Doctoral Dissertation, MIT.

Tsao, Feng-fu 1987. A Topic-Comment Approach to the ba Construction. *Journal of Chinese Linguistics,* 15:1-55.

Wang, Li 1957. *Zhongguo Yufa Lilun* (Theory of Chinese Syntax). Beijing: Zhonghua Press.

Williams, E. 1981. Argument Structure and Morphology. *The Linguistic Review* 1: 81-114.

Xu, Liejiong and Terence Langendoen 1985. Topic Structure in Chinese. *Language* 61:1-27.

Yang, Suying 1995. Ba and Bei Constructions in Chinese. *Journal of the Chinese LanguageTeachers Association* 30.3:1-36.

Yoo, Eun Jung 1993. Subcategorization and Case Marking in Korean. In Andreas Kathol and Carl Pollard (eds.) *Papers in Syntax.* The Ohio State University.

Yoon, James H-S. 1987. Some Queries Concerning the Syntax of Multiple Subject Constructions in Korean. In Kuno et al. (eds) *Harvard Studies in Korean Linguistics II.* Seoul: Hanshin Publishing Company.

Yu, Ning 1994. Towards a Definition of Unaccusative Verbs in Chinese. Paper presented at *NACCL 6*, University of Southern California, Los Angeles.

Zhang, Minlang 1994. Paper presented at *NACCL VI*. Los Angeles: University of Southern California.

Zhang, Shi 1990. Correlations Between the Double Object Construction and Preposition-Stranding. *Linguistic Inquiry* 21:312-316.

Zou, Ke 1993. The Syntax of the Chinese BA Construction. *Linguistics* 31:715-36

Zwicky, Arnold 1985. Clitics and Particles. *Language* 61:283-305.

Zwicky, Arnold and Geoffrey K Pullum 1983. Cliticization vs. Infection: English *n't*. *Language* 59:502-13