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

Qian Gao, B.A., M.A.

******

The Ohio State University

2001

Dissertation Committee: Approved by
Professor Carl J. Pollard, Adviser
Professor Peter W. Culicover
Professor Robert D. Levine

Adviser

Department of Linguistics
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 requirements. 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 right-headed, following the traditional head-initial system, but also left-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 Zhangsàn zhùlèi-le Lisí (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
VITA

March 28, 1955              Born - Lanzhou, China

1979                      B.A. English, Xinjiang University

1979-1987             Instructor,
              Xinjiang University

1987-1990                     Graduate Teaching Assistant,
                              University of Pittsburgh

1991                    M.A. Linguistics, University of Pittsburgh

1990-present                Graduate Research and Teaching Associate,
                              The Ohio State University

1998-2000                 Instructor,
                        Wright State University

PUBLICATIONS


ACKNOWLEDGMENT

It is a pleasure for me to thank all those who helped me, first of all my adviser, Carl J. Pollard, not only for his intellectual support, encouragement and enthusiasm in my thesis, but also for his patience in correcting both my stylistic and technical errors. His penetrating comments and stimulating suggestions forced me to sharpen my linguistic views, gave me new insight, and helped me concentrate on the real problems dealt with in this thesis. This thesis would be impossible without his untiring guidance.

I also wish to thank my other dissertation committee members Peter Culicover and Robert Levine. Their critical comments and insightful suggestions have made this thesis a better one. I am also very grateful to Professor James Tai, whose insightful discussions on various issues of Chinese grammar have greatly helped me form some wonderful ideas in the early stages of the thesis. Special thanks also go to Professor Brian Joseph, who not only saved me several times from losing sight of my academic career, but also made me a strong fighter as a linguist through his loving care for my academic life in Columbus.

The faculty members of the Department, most notably Mary Beckman, David Dowty, Michael Geis, Beth Hume, Rich Janda, Keith Johnson, Robert Kasper, David Odden, Craig Roberts, Donald Winford, and Arnold Zwicky have provided me with opportunities to talk seriously about lots of things that make life worth living, including linguistics. My fellow colleagues around Cunz Hall and Oxley Hall, Benjamin Ao, Christie Block, Mary Bradshaw, Mike Cahill, Michael Calcagno, Chang Chung, Kevin Cohen, John Dai, Paul Fallen, Jason Frank, Svetlana Godjevac, Guanyoon Goh, Karin Golde, Craig Hilts, Tsan Huang, Shunde Jin, Soyoung Kang, Andreas Kathol, Steven Keiser, Hyeree Kim, No-Ju Kim, Claudia Kurz, Gina Lee, Zhiyong Liu, Jean Mo, Nasiombe Mutonyi, Frederick Parkinson, Ruth Roberts-Kohno, Charlotte Schaengold, Misun Seo, Halyna Sydorenko, Kate Walker, Jiyi Wang, Pauline Welby, Neal Whitman, Chuck Yocom, Eun Jung Yoo, and Jae-Hak Yoon, are hereby thanked for their time shared with me and their kindness. Their friendship has been important in making me feel at home in Columbus.
Thanks are also due to my former teachers and colleagues both at University of Pittsburgh and Xinjiang University, and other academic units throughout the world. Due to space limit, I can only mention a few of them below. Sarah Thomason, Edward Anthony, and Daniel Everett have kindly introduced me to the linguistics world. Judy Yogman, Bonnie Young, Jenny Wang, Tienwei Xie, and Jianhua Bai shared lots of linguistic discussions with me. Peiliang Hou, Dengzhang Gao, Zhunsheng Liu, Yaming Guo, Margaret Sun, Xueqin Hong, Lanling Liang, and Xianghui Cao have never failed to encourage me to look at languages through a linguist eye. James Huang, Lisa Cheng, Thomas Ernst, and Marie-Claude Paris have kindly sent their valuable works to me.

The love and sacrifice my family has shown me are tremendous ones. I wish to thank my wife, Ping Sun, for her understanding and tolerance to my endless request for judgment on Chinese expressions. I also like to thank my sons, Frank Gao and Robert Gao, for their support and pretending interests in my work, even though they don’t know much about it.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>ii</td>
</tr>
<tr>
<td>DEDICATION</td>
<td>iii</td>
</tr>
<tr>
<td>VITA</td>
<td>iv</td>
</tr>
<tr>
<td>ACKNOWLEDGEMENT</td>
<td>v</td>
</tr>
<tr>
<td>CHAPTER 1 INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>1.0. Introduction</td>
<td>1</td>
</tr>
<tr>
<td>1.1. Syntactic Studies in Chinese</td>
<td>3</td>
</tr>
<tr>
<td>1.1.1. Li and Thompson and the Transformational Approaches</td>
<td>3</td>
</tr>
<tr>
<td>1.1.2. James Huang and GB</td>
<td>5</td>
</tr>
<tr>
<td>1.1.3. Lisa Travis and the Status of $bā$</td>
<td>6</td>
</tr>
<tr>
<td>1.1.4. Other Theories (Functionalism: James Tai, LFG: C-R Huang,</td>
<td>7</td>
</tr>
<tr>
<td>HPSG: Carl Pollard)</td>
<td></td>
</tr>
<tr>
<td>1.2. Theoretic Framework</td>
<td>7</td>
</tr>
<tr>
<td>1.2.1. Features and Lexical Entries</td>
<td>7</td>
</tr>
<tr>
<td>1.2.2. Phrase Structure Rules</td>
<td>8</td>
</tr>
<tr>
<td>1.2.3. The Binding Theory</td>
<td>9</td>
</tr>
<tr>
<td>1.3. Organization of the Paper</td>
<td>9</td>
</tr>
<tr>
<td>CHAPTER 2 TOPIC IN CHINESE</td>
<td>11</td>
</tr>
<tr>
<td>2.1. The Structure of Topic</td>
<td>11</td>
</tr>
<tr>
<td>2.1.1. The Notion of Topic</td>
<td>11</td>
</tr>
<tr>
<td>2.1.2. Topic Prominent Languages</td>
<td>12</td>
</tr>
<tr>
<td>2.1.3. Characteristics of Topic in Chinese</td>
<td>13</td>
</tr>
<tr>
<td>2.1.4. The Distinction between Topic and Subject</td>
<td>15</td>
</tr>
<tr>
<td>2.1.5. Topic-Comment Structure</td>
<td>18</td>
</tr>
<tr>
<td>2.2. The Relations between Topic and Other Parts of the Sentence</td>
<td>23</td>
</tr>
<tr>
<td>2.2.1. Topic Dependencies</td>
<td>23</td>
</tr>
<tr>
<td>2.2.2. Agreement in Nominal Phrases</td>
<td>27</td>
</tr>
</tbody>
</table>
2.2.3. The Properties of Topic-Dependent Empty Category ............................................. 29
2.2.4. The Syntactic Status of the EC ............................................................................. 31
2.2.5. Other Occurrences of pro’ ....................................................................................... 32
2.2.6. Other Relations ....................................................................................................... 36
2.3. Conclusion ..................................................................................................................... 38

CHAPTER 3 VALENCE ALTERNATIONS .............................................................................. 40
3.0. Introduction ..................................................................................................................... 40
3.1. The bā-Construction ..................................................................................................... 42
3.1.1. As a Light Verb .......................................................................................................... 44
3.1.2. As a Preposition ......................................................................................................... 46
3.1.2.1. NP Extraction ......................................................................................................... 47
3.1.2.2. Inflectional Morphemes ......................................................................................... 48
3.1.2.3. A-Not-A Questions ............................................................................................... 49
3.1.2.4. Scrambling ............................................................................................................. 50
3.1.2.5. Argument PP’s ..................................................................................................... 53
3.1.3. Case-Marking ........................................................................................................... 54
3.2. Zài Constructions ......................................................................................................... 59
3.2.1. When zài Does Not Function as a Verb ................................................................. 59
3.2.2. Comparison with bā .............................................................................................. 60
3.2.3. Two Different zài ’s ............................................................................................... 63
3.3. Other Constructions ..................................................................................................... 66
3.3.1. Yòng ......................................................................................................................... 66
3.3.2. Gēi ........................................................................................................................... 67
3.3.3. Others (cóng, duī, etc.) .......................................................................................... 68
3.4. Marking-marked Construction ................................................................................... 71
3.4.1. The Status of Markers in Chinese ........................................................................... 71
3.4.2. Marking-Marked Construction .............................................................................. 74
3.4.3. Valence Alternations .............................................................................................. 79

CHAPTER 4 HIERARCHICAL ARGUMENT STRUCTURES ...................................................... 86
4.0. Introduction ..................................................................................................................... 86
4.1. The Hierachical Argument Structure ........................................................................... 88
4.1.1. Keenan and Comrie (1977)'s Proposal ................................................................. 88
4.1.2. Pollard and Sag 1992 ............................................................................................ 92
4.1.3. Proto-Roles in Chinese ......................................................................................... 94
4.2. Linear Order .................................................................................................................. 98
6.2.2.4. \(<1>,<1',2'>\) and \(<1'>,<1,2'>\) Compounds ............................................. 179
6.2.2.5. \(<1,2'>,<1',2'>\) and \(<1',2'>,<1,2'>\) Compounds ....................... 180
6.2.2.6. The V-\textit{te} Compounds ............................................. 181
6.2.3. Verb Compounding Rules ..................................................... 183
  6.2.3.1. When the Head Is Intransitive ........................................... 188
  6.2.3.2. When the Head Is Transitive ........................................... 196
  6.2.3.3. Conclusion .................................................................... 207
6.3. Consequences ...................................................................... 210
  6.3.1. Relativization ................................................................... 213
  6.3.2. Topicalization ................................................................... 215
6.4. Conclusion ........................................................................... 215

CHAPTER 7 RESULTATIVE STRUCTURES ........................................ 217
7.0. Introduction .......................................................................... 217
7.1. The Background .................................................................... 218
  7.1.1. The RVC and the Resultative Structure ............................... 218
  7.1.2. Previous Analyses .............................................................. 220
    7.1.2.1. Gao's Analysis .............................................................. 220
    7.1.2.2. Goodall (1989)'s Arguments ......................................... 223
    7.1.2.3. Li (1985)'s Arguments for Clausehood Analysis ............... 224
    7.1.2.4. Huang (1991)'s Control Analysis .................................... 226
7.2. The Proposed Analysis .......................................................... 227
  7.2.1. Clausehood ....................................................................... 228
  7.2.2. Passivization .................................................................... 229
  7.2.3. The \textit{(lián)...dou} Construction ....................................... 231
  7.2.4. Emphasis with \textit{SHI} .......................................................... 232
  7.2.5. The Binding Principles ....................................................... 233
  7.2.6. The Proposed Analysis ....................................................... 234
  7.2.7. Idiom Chunks ................................................................... 237
7.3. Conclusion ........................................................................... 241
  7.3.1 The analysis of \textit{de} in V-\textit{de} ................................................ 241

CHAPTER 8 CONCLUSION ............................................................... 244
8.1. Summary .............................................................................. 244
8.2. Future Studies ....................................................................... 245

APPENDIX HISTORICAL CONSIDERATIONS OF PREPOSITIONS .......... 247
A.1. Historical Considerations of Prepositions ................................. 247
A.1.1. Instrumental ɣī Future Studies ......................................................... 247
A.1.2. Locative yú: .................................................................................. 248
A.1.3. Source zǐ: ...................................................................................... 249
A.1.4. Goal yū: ......................................................................................... 250
A.1.5. Destination zhī: ............................................................................. 251
A.2. Possible Prepositions in Contemporary Chinese ............................. 252
  A.2.1. The Word bèi ............................................................................... 252
    A.2.1.1. Historic Background .............................................................. 252
    A.2.1.2. Comparison with Case Markers .......................................... 254
    A.2.1.3. Similarities between bèi and the Locative Endings ............ 257
    A.2.1.4. The Syntactic Status of bèi-phrase ...................................... 257
    A.2.1.5. Other Issues on Bèi: ................................................................. 258
  A.2.2. Other Possible Prepositions in Chinese .................................... 260
REFERENCES ............................................................................................ 262
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 1981). 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 source sentences. For instance, it is claimed that passive sentences are derived from the active sentences through the passivization rule (Relational Grammar, Permuter 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 languages 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 separately 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 accordance 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-transformational 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 \( b\-\)construction. The word \( b\-\) 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 \( b\-\)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 \( b\-\)-construction.

(3) a. Zhānsān bā Lǐsī shuāidāo-le.
   Zhangsan BA Lisi throw-fall-PER
   'Zhangsan has thrown Lisi (to fall) to the ground.'

   b. Māmǐ bā qīchē māi-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. Zhānsān shuāidāo-le Lǐsī.
   Zhangsan throw-fall-PER Lisi
   'Zhangsan has thrown Lisi (to fall) to the ground.'

   b. Māmǐ māi-le qīchē.
   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 polysyllabic 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 \( b\-\)-construction is that not all sentences have \( b\-\) and non-\( b\-\) 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 \( b\-\)-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 transformational 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 languages), 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 languages 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. Ta xiang zhidao shei chile shenmo.
   he want know who eat-PER what
   'He wonders who ate what.'
b. Tā xiǎng zhīdào shéi wèi-shēngmò méiyǒu lái.
   he want know who why not-PER come
   'He wonders who did not come and why.'

c. Tā xiǎng zhīdào shéi zài-nǎer chí-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 bā
Another related issue in the studies of bā-construction is how the word bā 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 bā 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 bā and non-bā 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 bā 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 bā as a Case marking preposition, she suggests that it is a (weakened) verb. Huang (1991) treats bā 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 bā is argued to be the external argument and bā assigns the exceptional Case to it.

Some other analyses such as Tsao (1987) and Gao (1991) argue that bā 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 *chîle* 'eat' may have the following lexical entry.
(8) the verb sign of the *chíle*

\[
\begin{align*}
\text{PHON} & \langle \text{chíle} \rangle \\
\text{SYNSEM|LOC|CAT|HEAD} & \text{VERB} \left[ \text{VFORM \ perfective} \right]
\end{align*}
\]

Thus from (8) we can tell that *chíle* 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*

\[
\begin{align*}
\text{PHON} & \langle \text{wǔtiáo} \rangle \\
\text{SYNSEM|LOC|CAT|HEAD} & \text{CLASSIFIER} \left[ \text{SPEC N} \left[ \text{NUMBER \ plural} \right] \text{SHAPE tiao} \right]
\end{align*}
\]

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:  
\[
\text{XP[SUBJ < >]} \rightarrow [1]\text{YP, XP[SUBJ <[1]>]} \\
\text{SUBJ} \quad \text{HEAD}
\]

b. Head-Specifier Schema:  
\[
\text{XP} \rightarrow [2]\text{YP[SPEC [1]}, [1]\text{X[SPR <[2]>]} \\
\text{SPR} \quad \text{HEAD}
\]

c. Head-Comps Schema:  
\[
X' \rightarrow [1], X^0[\text{COMPS [1]}] \\
\text{COMPS} \quad \text{HEAD}
\]

d. Head-Adjunct Schema:  
\[
X' \rightarrow \text{YP[MOD [1]}, [1]\text{X'}} \\
\text{ADJUNCT} \quad \text{HEAD}
\]

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 according 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 arrangement 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 apparent 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.
CHAPTER 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 yè zì hěn dà.
    this-CL tree leaf very big
    'This tree has very big leaves.'
2.1.2. Topic Prominent Languages

In the literature, topic prominence is used in contrast with subject prominence (Chaie 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 transformational 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 know ti.
   c. John, I know him.t.

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 kimotii-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 koahay
   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 wǒ rènshī tī
    Zhangsan I know
    'Zhangsan, I know'

(10) Zhāngsān wǒ rènshī tā jiā
    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. 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) Shúguō, Zhāngsān zúi xīhuān mǎi píngguǒ
    fruit Zhangsan most like buy apple
    'As for fruits, Zhangsan likes most to buy apples.'

(12) Yú, Zhāngsān tèbié xīhuān chí 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, 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 coinex 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 zúi xǐhuān mǎi niúròu
fruit Zangsan most like buy cow-meat
'*As for fruits, Zangsan likes most to buy beef.'

(14) *Yú, Zhāngsān tèbíé xǐhuān chí huāshèng.
fish Zangsan especially like eat peanut
'*As for fish, Zangsan 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 zúi xǐhuān mǎi shuǐguǒ de píngguǒ
Zhangsan most like buy fruit-in DE apple
'Zhangsan likes most to buy apples, among all the kinds of fruits.'

(16) Zhāngsān tèbíé xǐhuān chí 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 xiào xùe de shí hou sì-le fū qīn.
Zhangsan attend elementary-school DE time die-PER father
'When Zhangsan was in elementary school his father died.'

b. *Xiào xùe sì-le fū qīn de shí hou zhāngsān shàng.
elementary-school DE time die-PER father Zhangsan attend

c. *Zhāngsān shàng sì-le fū qīn de xiào xùe
Zhangsan attend DE time die-PER father elementary-school

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

b. *Nèi-ge rén tā bèi tī dàshāng-le.
that-CL person he by hit-wound-PER

c. *Tā bèi tī dàshāng-le de nèi-ge rén
he by hit-wound-PER DE that-CL person

Thus in (i) shàng xiào xùe de shí hou '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
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-jìàn shì, zhīyòu Zhāngsān cái néng zuò zhū.
this-CL matter only Zhangsan alone can make master
'On this matter, only Zhangsan himself can make decision.'

b. *Zhīyòu Zhǎngsān cái néng zuò zhū zhè-jìànshì.
only Zhangsan alone can make master this-CL matter

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

b. *Nǐ yào fǔ 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 téng.
he head ache
'He has a headache.'

adjunct prepositional phrase and therefore extraction of the NP after bèi is ruled out.
b. Tā (dū ē zhè-jìàn shī) 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 argue. For instance, the optional de, a possessive indicator, may be used to argue for a possessive 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 téng '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 (dū ē zhè-jìàn shī) hěn 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 zuǐ háochí.
     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. Lǐshì (de) tòu hěn téng.
   Lǐshì DE head very ache
   'Lǐshì has a severe headache.'

   b. Lǐshì tài de tòu hěn téng.
   Lǐshì 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, Lǐshì and tòu bear the modifier-modified relation. But without de, tài needs to be analyzed as the topic while tòu '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 duó.
   China population very many
   'In China, there are a lot of people.'

   b. *Zhōngguó rénkǒu, hěn duó.
   China population very many

(24) a. Zhāngsān, a, wǒ rènshī tài
   Zhāngsān TOP I recognize he
   'As for Zhāngsān, I know this guy.'

   b. *Zhāngsān, wǒ a rènshī tài
   Zhāngsān 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 pro 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 \textit{sign}. Signs have subsorts \textit{word} and \textit{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 \textit{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 \hspace{1cm} \text{XP} \rightarrow [1], \text{X[COMPS <[1]>]}
\hspace{1cm} \text{COMPS} \rightarrow \text{HEAD}

b. Subject-Head Schema \hspace{1cm} \text{XP} \rightarrow [1]YP, \text{XP[SUBJ <[1]>]}
\hspace{1cm} \text{SUBJ} \rightarrow \text{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 \textit{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 \hspace{1cm} \text{S} \rightarrow [1]XP, \text{S[TOPIC <[1]>]}
\hspace{1cm} \text{TOPIC} \rightarrow \text{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**

\[
\begin{array}{c}
\text{CAT} \\
\text{TOPIC} (\langle \rangle) \\
\text{SUBCAT} \{1\} \\
\text{CONTENT} \{2\}
\end{array}
\]

\[
\begin{array}{c}
\text{HEAD} \\
\text{verb}
\end{array}
\]

\[
\begin{array}{c}
\text{CAT} \\
\text{TOPIC} (\langle XP \rangle) \\
\text{SUBCAT} \{1\} (\langle YP \rangle) \\
\text{CONTENT} \{2\}
\end{array}
\]

\[
\begin{array}{c}
\text{about} \\
\text{TOPIC} \{3\} \\
\text{COMMENT} \{2\}
\end{array}
\]

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

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

\[
\begin{array}{c}
\text{PHON} \{1\}
\end{array}
\]

\[
\begin{array}{c}
\text{HEAD} \text{ verb} \\
\text{SUBCAT} \{2, 3\}
\end{array}
\]

\[
\begin{array}{c}
\text{SYNSEM|LOCAL|CAT} \\
\text{TOPIC} \{NP\} \\
\text{SUBJ} \{2 \text{NP}\} \\
\text{COMPS} \{3\}
\end{array}
\]

\[
\begin{array}{c}
\text{PHON} \{1\}
\end{array}
\]

\[
\begin{array}{c}
\text{HEAD} \text{ verb} \\
\text{SUBCAT} \{2, 3\}
\end{array}
\]

\[
\begin{array}{c}
\text{SYNSEM|LOCAL|CAT} \\
\text{TOPIC} \langle NP \rangle \\
\text{SUBJ} \langle 2 \text{NP} \rangle \\
\text{COMPS} \langle 3 \text{NP} \rangle
\end{array}
\]

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-jìànsì, wèiyuánhùi yǐjīng zuòchū-le juédīng.
this-CL matter committee already make-out-PER decision
'On this matter, the committee has already made a decision.'

b. Zhè-ge rén, wò rènshì tā.
this-CL person I know he
'As for this person, I know him.'
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 zhē-jīàn shī 'this matter' and the comment sentence wēiyuănhuí yījīng zūøchu-le juědìng '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 pronoun⁷ 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, wǒ rènshī e₁
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.
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. \(zhē-ke \ shù \ yèzi \ hěn \ dà\).
   'This tree leaf very big.'

\(d'\).

As we can see from the analysis 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 structures 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. Pingguō, Zhāngsān māi-le
   apple Zhangsan buy-PER
   'Zhangsan has bought the apples.'

b. Zhāngsān māi-le píngguō,
   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 pingguō '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, *pingguǒ* '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)  Pingguǒ, Zhāngsān māi-le wū-gè.
     apple Zhangsan buy-PER five-CL
     'As for apples, Zhangsan has bought five of them.'

(32)  Miàntiáo, Zhāngsān chī-le sān-dàwān.
     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-dàwān/ *sān-dàkuài/ *sān-xiāoqūn
     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-dàwān/ *sān-dàkuài/ *sān-xiāoqūn 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. Niqū, wǒ zhùa-le wūshí-tiáo/ *wūshí-jíàn/ *wūshí-bù
     loach I catch-PER fifty-CL fifty-CL fifty-CL
     'As for loaches, I caught fifty of them.'

     b. Wǒ zhùa-le wūshí-tiáo/ *wūshí-jíàn/ *wūshí-bù niqū.
     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)  

    DP
    
    SPEC D' D NP

24
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

```
        KP
       /   \
      Spec K'
    /     \
   K      NP
  /   \    \ Spec
Num CL  N'  N
```

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) Wù-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-bēn zázhì, Mǎi jìězǒu-le bā-bēn.
    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 wù-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 wù-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 wù-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 zhī xǐhuān chǐ tián-de. apple Zhangsan only like eat sweat-DE
   'As for apples, Zhangsan only likes (to eat) sweat ones'

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

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

   b. Zhāngsān zǔ ài mǎi xǐ-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 wù-gè hón̄g-de píngguǒ. Zhangsan buy-PER five-CL red-DE apple
   'Zhangsan has bought five red apples.'
(42) a. Miàntiáo, Zhângsàn chî-le sâń-wâń xî-de.
noodles Zhångsan eat-PER three-bowl thin-DE
'As for noodles, Zhångsan has eaten three bowls of thin ones.'

b. Zhângsàn chî-le sâń-wâń xî-de miàntiáo.
Zhångsan eat-PER three-bowl thin-DE noodles
'Zhångsan 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. Qîché, Zhângsàn xîhuân rîbên zhîzào de.
car Zhångsan like Japan make DE
'As for cars, Zhångsan likes those made in Japan.'

b. Zhângsàn xîhuân rîbên zhîzào de qîché,
Zhångsan like Japan make DE car
'Zhångsan likes cars that are made in Japan.'

(44) a. Qîché, Zhângsàn xîhuân nî zuòtián mài de nêi liàng.
car Zhångsan like you yesterday buy DE that CL
'As for cars, Zhångsan likes the one you bought yesterday.'

b. Zhângsàn xîhuân nî zuòtián mài de nêi liàng qîché.
Zhångsan like you yesterday buy DE that CL car
'Zhångsan likes the car you bought yesterday.'

(45) a. Pingguô, Zhângsàn xîhuân nî gâng cóng shùshâng zhâi-xiàlai de nêi apple Zhångsan like you just buy tree-top pick-down DE that wû-gê dâ-de.
five-CL big-DE
'As for apples, Zhångsan likes the five big ones you just picked from the tree.'

b. Zhângsàn xîhuân nî gâng cóng shùshâng zhâi-xiàlai de nêi wû-gê Zhångsan like you just from tree-top pick-down DE that five-CL dâ-de pingguô.
big-DE apple
'Zhångsan 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) 五条/ 五寸/ 五见/ 五张/ 五名/ 五条
five-CL five-CL five-CL five-CL five-CL loach
‘five loaches’

(47) 五条五寸/ 五尺/ 五寸六分/ 五斤/ 五生/ 五条
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 (CIP) 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 五条 ‘five-CL’ in (46) and (47).

(49)

\[
\begin{array}{c}
\text{PHON (五 - 条)} \\
\text{SYNSEM|LOC|CAT|HEAD } \text{SPEC N[NUM plural, SHAPE tiao]} \\
\end{array}
\]
The lexical specification in (49) can correctly describe the behavior of *wū-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 wū-tiáo/ *wū-túān/ *wū-jíān/ *wū-zhāng/ *wū-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/ *yízi/ *píngguǒ/ *shūníú/ *xuéshēng, wǒ kànjiān-le wū-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-CIP 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-CIP position is coindexed with the antecedent, it shares information with the antecedent, including the agreement features. So for instance, when the empty category after wū-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 wū-tiáo can satisfy all the agreement requirements in (50).

Our proposed empty category in post-CIP 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-CIP 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) [[Pingguō_i]_{NP}, wò bù ài chī [suan-de [e_i]_{NP}.
    apple I not love eat sour
    'As for apples, I don’t like (to eat) sour ones.'

(53) [[Pingguō_i]_{NP}, Zhāngsān názōu-le [sān-gè [e_i]_{NP}.
    apple Zhangsan take-away-PER three-CL
    'As for the apples, Zhangsan took away five of them.'

(54) [Wō-gē [píngguō_i]_{NP}, Zhāngsān názōu-le [sān-gè [e_i]_{NP}.
    five-CL apple Zhangsan take-away-PER three-CL
    'As for the five apples, Zhangsan took away five of them.'

(55) [[Pingguō_i]_{NP}, tā zū yào [nǐ gāng cóng shùshāng zhāi-xiālái de apple he only want you just from tree-top pick-down DE
    [nèi jī-gè [hóng-de [e_i]_{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. [[*Pingguō/ *yízi/ *nǐqiū/ shūniú_i]_{NP}, wò mǎi-le [shí-tóu [e_i]_{NP}. apple chair loach water-buffalo I buy-PER ten-CL
    'As for water-buffalos, I have bought ten of them'

   b. Wō mǎi-le [shí-tóu [*píngguō/ *yízi/ *nǐqiū/ shūniú_i]_{NP}.
    I buy-PER ten-CL apple chair loach water-buffalo
    'As for water-buffalos, I have bought ten of them'

   c. [[Shūniú_i]_{NP}, wò mǎi-le [*shí-liàng/ *shí-jìa˚n/ *shízhāng shí-tóu [e_i]_{NP}.
    water-buffalo I buy-PER ten-CL ten-CL ten-CL
    'As for water-buffalos, I have bought ten of them'

   d. Wō mǎi-le [*shí-liàng/ *shí-jìa˚n/ *shízhāng shí-tóu [shūniú_i]_{NP}.
    I buy-PER ten-CL ten-CL ten-CL water-buffalo
    'I have bought ten water-buffalos'

(57) a. [[Pingguō/ yízi/ nǐqiū/ shūniú_i]_{NP}, wò xīhuān [[nǐ mǎi de [e_i]_{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. Wō xīhuān [nǐ mǎi de [[píngguō/ yízi/ nǐqiū/ shūniú_i]_{NP}.
    I like you buy DE apple chair loach water-buffalo
    'I like the apples/chairs/loaches/water buffalos that you bought.'

30
(58) a. [[Píngguǒ/ yǐzǐ/ níqiǔ/ shūniú]NP, wǒ xǐhuān [[xiǎo-de [e]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/ yǐzǐ/ níqiǔ/ shūniú]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 jùn/ *měi běn [Píngguǒ]NP, tā dōu yào shǎo gěi [yī-gè/ every CL every CL apple he all want less give one-CL
*yī-jìān [e]N]NP.
one-CL
'There is one apple less in every pound of apples he sells.'

(60) [Yì-dàqún/ *yì-dàdúi [shūniú]NP, tā zhī mǎi-zǒu-le [sì-tóu/ every CL every CL water-buffalo he only buy-go-PER four-CL
*sì-jiāng [e]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 (CIP). We repeat the structure as (61) below.

(61) Gao's NP structure

```
NP
  /\   
 CIP  Modifier
    /\       
   N'  Modifier
    /\                     
   N  NP[de]  N
```
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 yì-běn yǔyánxué-de shū 'a book about linguistics', yǔyánxué 'linguistics' is the complement of the head noun shū 'book'. Likewise, in the ambiguous phrase Lìsì-de gùshì '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 gùshì 'story'. The possessive use of Lisi only makes it an adjunct modifier for the head noun. Now examine the following.

   ten-CL book Mary borrow-go-PER eight-CL thick DE
   'Of the ten books, Mary has borrowed (away) eight thick ones.'

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

(63) Nèixie gùshì, Mǎfù zhí xīhuān Lìsì de.
   those story Mary only like Lisi DE
   a. 'Of those stories, Mary only likes Lisi.'
   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 Lìsì-de gùshì '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. Píngguǒi, Zhāngsān bā tâmeni názōu-le.
   apple Zhangsan BA they take-go-PER
   'As for the apples, Zhangsan has taken them away.'

      apple Zhangsan BA three-CL three-CL take-go-PER
      'As for the apples, Zhangsan has taken away three of them.'

      five-CL five-CL apple Zhangsan BA three-CL three-CL
      [pro'i]N]NP názōu-le.
      take-go-PER
      'As for the five apples, Zhangsan has taken away three of them.'

      one-CL one-CL apple Zhangsan BA three-CL three-CL
      názōu-le.
      take-go-PER
      'As for the basketful of apples, Zhangsan has taken three of them away.'

      that-CL vegetable-knife Zhangsan use it chop-PAST meat
      'As for the kitchen knife, Zhangsan chopped meat with it.'

      two-CL two-CL vegetable-knife Zhangsan use one-CL one-CL
      [pro'i]N]NP qìe ròu, yòng fēng [yì-bā/ *yì-běn [pro'i]N]NP qìe
      chop meat use another one-CL one-CL chop
      cǎi.
      vegetable
      'As for the two kitchen knives, Zhangsan chops meat with one and chops
      vegetables with the other.'

      Yongfeng middle-school I ZAI there read-PAST high-middle(school)
      'As for Yongfeng Middle School, I went to high school there.'

      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 háizì, Māfū gēi tā jǐao-guo yīngyú.
      that-CL child Mary GEI he teach-PAST English
      'As for the child, Mary taught him English.'

      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 coinlexing of the resumptive pronoun in the subject position with the topic is also required.

(68) a. Nèi-ge háizi, tā hài bú hū shuò yīngyu.  
    that-CL child he yet not able say English  
    'As for the child, he cannot speak English yet.'

    ten-CL child only three-CL not able say English  
    'As for the ten children, only three cannot speak English.'

    two-CL two-CL tiger one-CL one-CL not-have  
    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.'

    ten-CL ten-CL novel two-CL two-CL be  
    mài de, [sān-bēn/ *sān-tiāo [pro'i]N]NP shí cóng tūshūguǎn jiè de,  
    buy DE three-CL three-CL be from library borrow 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 coinlexed with an o-comanding argument within the sentence while resumptive pronouns cannot.

First, we look at the well-known bā-construction in Chinese. In Chapter 3, I will argue that the word bā is actually a marker marking the thematic role of the following nominal phrase. Thus the bā-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 bā-phrase thus can o-bind the pro' in the object position. But this binding relation cannot hold between the resumptive pronoun and the bā-phrase. The following examples show this difference.

(69) a. *Zhāngsān bā nèi-ge pīngguǒ názōu-le tǎi.  
    Zhangsan BA that-CL apple take-go-PER it  
    'Zhangsan has taken away three of the apples.'

    Zhangsan BA apple take-go-PER three-CL three-CL  
    'Zhangsan has taken away three of the apples.'
Zhangsan BA five-CL five-CL apple take-go-PER three-CL
*sān-bēn [pro']N]NP,
three-CL
'Zhangsan has taken away three of the five apples.'

Zhāngsǎn BA one-CL one-CL apple take-go-PER three-CL
*sān-tiáo [pro']N]NP,
three-CL
'Zhāngsǎn 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 bà-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 bà-phrase and we see in (69) that only pro' obey this principle, not the resumptive pronoun.  

---

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: Wō bā wū-tiáo yú fángzǐ-le sī-zhāng zhuōzì-shang.
I BA five-CL fish place-at-PER four-CL table-top
'I have put five fish on four tables.'

B: *Zhuōzǐi, wō bā sī-tiáo [pro'] fángzǐ-le wū-zhāng [pro'] 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 bà-phrase is not (properly) bound because bà-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 zhuōzǐ 'table', which has the agreement feature set to zhāng, and the classifier sī-tiáo 'four (fish)', which has the agreement feature tiáo. If this agreement is satisfied, the sentence can be acceptable, as is the case in (ii).

(ii) A: Yúi, wō bā sī-tiáo [pro'] fángzǐ-le wū-zhāng zhuōzí-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 bà-phrase. However, the bà-phrase has the agreement feature set to tiáo, which is not compatible with the object agreement feature zhāng. This is further illustrated in the following.

(iii) *Zhuōzǐi, wō bā sī-tiáo yú fángzǐ-le wū-zhāng [pro'] 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 bà-phrase is made compatible, the sentences will be acceptable. This is shown in the following.

(iv) Wō bā sī-zhāng zhuōzǐi fángzǐ-le wū-zhāng [pro'] 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 pángguǒ tān-le tā.
    that-CL apple rot-PER it

b. [Sì-ge/ *sì-jiàn [pángguǒ]NP lán-le [sān-ge/ *sān-li [pro\']N]NP
    four-CL four-CL apple rot-PER three-CL three-CL
    'Three of the four apples become bad.'

c. [Shí-ke/ *shí-jìàn [shù]NP zhī huó-le [sān-ke/ *sān-li [pro\']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-kē shù yèzǐ 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-kē shù 'this tree' is an added argument to the sentence yèzǐ 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 yèzǐ and the topic zhè-kē 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,

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

\[ (v) \quad Zhùzǐ, wǒ bā sì-zhāng [e\] fāngzāi-le wǔ-zhāng [e\] shāng. \]
\[ table \quad I \quad BA \quad four-CL \quad place-at-PER \quad five-CL \quad -top \]
\[ 'As for the tables, I have put four on top of five.' \]

\(^{12}\) 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.

36
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-kē shù, tā/yǒu de yèzi hěn dà.
    this-CL tree it DE leaf very big
    'As for this tree, its leaves are very big.'

b. *Zhè-kē 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-kē 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 specifier to form a full phrase.

(72)  [Nèi wù-míng [zuǐfā],]NP, fāyuàn bōduō-le [sān-míng [pro'],]NP
de zhèngzhīquǎn
DE political-right
'As for the five criminals, the court deprived three of their political rights.'

As (72) shows, within the possessive phrase sān-míng de 'three (criminals)'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 zú xǐhuān nǎi píngguǒ
fruit Zhangsan most like buy apple
'As for fruits, Zhangsan likes most to buy apples.'

(12)  Yú, Zhāngsān tèbié xǐhuān chí 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.\textsuperscript{13}

\textsuperscript{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.
CHAPTER 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 bā 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 *bā*-and non-*bā*-constructions: (1a) is known as a non-*bā*-construction and (1b) as a typical *bā*-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 *bā* also plays an unusually important role in the literature. In one point of view *bā* 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 *bā* 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 作 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. 女人yào 学xié 刘Lǐ 风Fēng.
   we must learn Lei Feng
   'We must learn from Lei Feng.'

b. 女人yào xiàng 刘Lǐ 风Fēng 学xié.
   we must towards Lei Feng learn
   'We must learn from Lei Feng.'

c. 女人yào xiàng 刘Lǐ 风Fēng 学xié zhùénfēiè 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. 李Lǐ 去qù 京Bēi jīng.
   Lisi go-PER Beijing
   'Lisi went to Beijing.'

b. 李Lǐ 往wǎng 京Bēi jīng 去qù.
   Lisi toward Beijing go-PER
   'Lisi went to Beijing.'

c. 李Lǐ 往wǎng 京Bēi jīng 去qù yi-ge diànhuà.
   Lisi toward Beijing make-PER one-CL telephone
   'Lisi made a telephone call to Beijing.'

(4) a. 张张三sān hěn mǎnyì zhè jian shì.
   Zhangsan very satisfy this CL matter
   'Zhangsan is satisfied with this matter.'

b. 张张三sān 对duì zhè jian shì hěn mǎnyì.
   Zhangsan concerning this CL matter very satisfy
   'Zhangsan is very satisfied with this matter.'

c. 张张三sān 对duì 我wǒ fā-quo shì.
   Zhangsan toward I make-EXP pledge
   'Zhangsan made a pledge to me.'

(5) a. 玛mǎi 要lái-quo měiguó.
   Mary come-EXP U.S.A.
   'Mary has been to the United States.'

b. 玛mǎi 到dào měiguó lái-quo.
   Mary arriving U.S.A. come-EXP
   'Mary has been to the United States.'

c. 玛mǎi 到dào měiguó 学xué-quo yú yánxué.
   Mary arriving-at U.S.A. study-EXP linguistics
   'Mary has been to the United States to study linguistics.'

(6) a. 唐mǔ gōu zǒu 学shèn-shān-láo-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 zǒu chū 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 běi chū yǐ-kuāng cáo-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. Lìsì chángchāng chī fànguǎn.
Lisi often eat restaurant
'Lisi often eats in restaurants.'

b. Lìsì chángchāng zài fànguǎn chī fàn.
Lisi often at restaurant eat meal
'Lisi often eats his meals in restaurants.'

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

b. Lìsì bù hū 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 bà 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 bà 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 bà. 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 bà-Construction

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

(9) a. Zhāngsān bà Līsì dābài-le
Zhansan BA Lisi fight-defeat-PER
'Zhansan has defeated Lisi.'

b. Līsì bèi Zhāngsān dābài-le
Lisi BEI Zhangsan fight-defeat-PER
'Lisi has been defeated by Zhangsan.'
Tai claims that the conversion from the bā-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 underlingly an SOV language. This is a direct challenge to the traditional belief that Chinese is basically an SVO language. In the SVO point of view, the bā-construction is derived from the non-bā-construction and the word bā functions as a coverb (or a preposition) that takes a postverbal 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-bā-construction is derived from the bā-construction since the bā-construction is the underlying structure in Chinese. But it was not clear why the bā-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, bā 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 bā- and non-bā-construction alternations. So in Li's analysis, hā functions only as a Case assigner (or a Case marker). However, questions remain. Goodall (1989) notes the following sentences.

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

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

Note that in (10) tiēshū 'iron tree' can also appear on both side of the first verb kū 'cry': when it appears to the left of the verb, bā is used; when it appears to the right of the verb, no bā is used. However, tiēshū 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 bā 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 bā 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 bā Lìsī dābāi-le
   'Zhangsan has defeated Lisi.'

   Zhangsan BA Lisi fight-defeat-PER

b. Zhāngsān dābāi-le Lìsī
   'Zhangsan has defeated Lisi.'

   Zhangsan fight-defeat-PER Lisi

c. 

\[
\begin{array}{c}
\text{IP} \\
/\hline
\text{NP} \\
/\hline
\text{Zhāngsān} \\
\text{I} \\
\text{VP}_1 \\
\text{V} | \\
\text{V} | \\
\text{VP}_2 \\
/\hline
\text{NP} \\
/\hline
\text{Lìsī} \\
\text{V} | \\
\text{V} \\
\text{dābāi}
\end{array}
\]

In (11), V₁ 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 V₁ position: either V₂ moves up so we get (11b), or the light verb bā is inserted under V₁ so we get (11a).

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

(12) a. Zhāngsān chībāo-le fàn.  
Zhangsan eat-full-PER meal.  
'Zhangsan is full (from eating his meal).'</b>

b. *Zhāngsān bā fàn chībāo-le  
Zhangsan BA meal eat-full-PER

(13) a. Zhāngsān bā shūbāo fàngzāi-le zhuōzīshàng  
Zhangsan BA book-bag place-at-PER table-top  
'Zhangsan put the book bag on the table.'

b. *Zhāngsān fàngzāi-le shūbāo zhuōzīgàng.  
Zhangsan place-at-PER book-bag table-top

Evidently there are some kind of thematic constraints on the bā-phrase. And it is not clear, in a light verb analysis like Huang’s, how one can make sure that in (12) bā cannot be inserted so that the lower verb is guaranteed to move up; or in (13) bā 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 bā is taken to be the main (notional) verb of the sentence. Under this proposal, the verb bā subcategorizes for an NP and a special kind of VP. Thus in an example like (11a), bā is base generated in the matrix verb position and it subcategorizes for the NP Lìshì and the resultative verb compound dàbāi-le 'have defeated'. We would assume that under this approach (11b) should also be base generated with dàbāi-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 bā or the fact that some resultative verbs like that in (13) cannot be base generated but have to be subcategorized by bā?

Those difficulties aside, none of the approaches discussed above have given much empirical evidence that bā 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 bā as a verb,

---

1 In Gao (1993) this special VP is argued to be headed by the resultative verb compound.
the word bā 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 dābāi 'defeat', then to inflectional phrase (Zou's PARP (particle phrase), and then to BAP (bā phrase). In (11a), the preverbal NP Lǐsī gets its theta role from the verb but then is moved to Spec of PARP to get (exceptional Case) from bā. So we assume that bā 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 bā, such as dūi, 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 bā 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 bā all fail to give a satisfactory explanation of the alternation of bā and non-bā 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 approaches to the analysis of bā and non-bā alternations. A noticeable similarity of these analyses is the treatment of bā as a verb (or functional head in Zou 1994). As already pointed out, these analyses only assume that bā is a verb. None of them have presented any evidence supporting this assumption. A different point of view is to treat bā 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 bā should be treated as a preposition. In Gao (1992) it has been argued extensively that bā does not behave like a verb. Rather, it is more like other so-called prepositions.

As is observed in all the previous analyses, bā always appear before an NP. This may suggest that bā behaves as a lexical item that subcategorizes for an NP. This would rule out the possibility of treating bā 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 \(bā\) displays all the characteristics of a preposition and none of a verb.

First, the possibility of \(bā\) 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 \(bā\) 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) Qīchē, tā mài-le.
car  he sell-PER
 'He sold (his) CAR.'

(15) \[\text{[NP} [S Līsī rènshī \text{e}] \text{de nèi ge rén]} mài-le qīchē.\]
Līsī  know  DE  that  CL  person  sell-PER  car
 'The person that Līsī knew sold the car.'

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

(17) *[NP [S Tā cóng e lái] \text{de nèi ge dúfāng} fēicháng měi] tí.
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 \(bā\) is a preposition, we should expect that no NP can be extracted from a \(bā\)-phrase. As the following examples show, this prediction is correct.

(18) *Qīchē, tā bā 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.
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 morphemes⁴: 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)  Zhāngsàn ná-le yī-běn shū.  
Zhangsan take-PER one-CL book.
'Zhangsan took a book.'

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

But a typical preposition in Chinese does not take any inflectional morpheme⁵. 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.'

he wear glasses look book

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

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

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

48
(23) *Tā wǎng-quo Běijīng dā diànhuà.
he to-EXP beijing hit telephone
Intended reading: 'He has made telephone calls to Beijing.'

(24) *Zhāngsān cóng-le Wūlùmǔqí dāilái-le yī-ben shū.
Zhansan from-PER Urumchi bring-come-PER one-CL book.
Intended reading: 'Zhansan brought a book from Urumchi.'

Lisi in-PROG wall-top hang one-CL picture.
Intended reading: 'Lisi is hanging a painting on the wall.'

If we assume bā 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 bā-quo qīché mài le.
he BA-EXP car sell LE
Intended reading: 'He has sold the car.'

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

(28) *Tā bā-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 chi 'eat' is chibuchi or chimeichi 'eat-not-eat'. In the same way, the A-not-A form for the verb xīhuān 'like' is xīhuānbuxīhuān or xībuxīhuān 'like-not-like'. The prepositions, however, do not undergo this change.

(29) Zhāngsān cháimeichīwan fān?
Zhansan eat-not-chi-finish meal
'Did Zhansan finish his meal?'

(30) Lìsī mǎibumǎi qīché?
Lisi sell-not-sell car
'Does Lisi sell cars?'

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

These examples show that na 'take' can be used both as a preposition in (1a) (denoting a single action) and a verb in (1b) (denoting a series of actions) but has different interpretations, dāi 'wear' can only be used as a verb in (1ib), and yòng 'use' now only has a prepositional function in (1iii).
(32) *Zhāngsān cōngměicōng Wūlǔmùqī dàilái le yì běn shū?
    Zhangsan from-not-from Urumchi bring-come-PER one CL book
    Intended reading: 'Did Zhangsan bring a book from Urumchi?'

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

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

(34) *Lìsì bābubā ěrzǐ 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 chénglǐ mài-le qǐché.
    he at city sell PER car
    'He sold (his) car in the city.'

    b. *Tā mài-le qǐché zài chénglǐ.
    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 construction6 (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. Lìsì kǎi tā de qǐché qù xuéxiào.
    Lisi drive he DE car go school
    'Lisi drives his car to go to school.'

    b. Lìsì qù xuéxiào kǎi tā de qǐché.
    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. Zhāngsàn dài-zhe yǎnjīng kàn shū.
    Zhangsan wear-DUR glasses see book
    'Zhangsan reads with glasses.'

    b. Zhāngsàn kàn-zhe shū dài yǎnjīng.
    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 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 bā wǒ gānchūlai-le.
    he from home BA me drive-out-PER
    'He drove me out of the house.'

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

(40) a. Zhāngsàn bā fàn chīwān-le.
    Zhangsan BA meal eat-finish-PER
    'Zhangsan ate and finished the meal.'

    b. *Zhāngsàn chīwān-le bā fàn.
    Zhangsan eat-finish-PER BA meal

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

Thus all the tests discussed above show that bā patterns closely with other prepositions rather than verbs and it seems that bā-phrase should be better treated as a prepositional phrase. However treating bā as a preposition also faces some difficulties. For instance, we notice from the discussion above that bā 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.  

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

(41)  zhāngsàn bā lǐ sī dǎduàn-le yī tiáo tūi.  
      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 yi tiáo tūi ‘a leg’ there is always a possessive before the noun. 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 bā is treated as verb, the NP after bā can always fulfil this obligation and we get the correct interpretation. Li’s criticism is that if we treat bā as a preposition to form a prepositional phrase with the following NP, this relation is no longer available because the NP after bā is no longer in a c-commanding position to the postverbal NP’s. The different configurations is shown below.

(42)  Treating bā 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 subort of ergative verbs such as duàn in the following sentences.

(i)  zhāngsàn de yī-tiáo nǎ duàn-le.  
      Zhangsan DE one-CL leg break-PER  
      ‘Zhangsan’s one leg broke.’

(ii) zhāngsàn duàn-le yī-tiáo nǎ.  
      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.
3.1.2.5. Argument PP's

The difficulties that the prepositional analysis of bā 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 talked to Mary about herself.
       b. Julie talked about Mary to herself.

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; beside herself; since he was eighteen.
   b. *John has worked beside Jane; under herself; 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 bā 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 bā simply because the preverbal non-subject position is not covered by an abstract Case.

(46) a. Zhāngsān bā fàn chīwán-le
   Zhangsan BA meal eat-finish-PER
   'Zhangsan has finished (eating) his meal.'
b. Zhāngsān chīwǎn-le fàn.
   Zhangsān eat-finish-PER meal.
   'Zhangsān 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) Jiǎi lǎi rén le
    home-inside come person PER
    a. 'Someone has arrived at (our) home.'
    b. 'Someone has arrived from (our) home.'

Explaining the ambiguity of the sentence, Li argues that the verb lǎi '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 lǎi. If the argument was not in the subject position, a Case marker cōng '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 dābái-le Lišī.
    Zhangsān fight-defeat-PER Lisi
    'Zhangsān has defeated Lisi (in a fight),'

b. Zhāngsān bā Lišī dābái-le
    Zhangsān BA Lisi fight-defeat-PER
    'Zhangsān has defeated Lisi (in a fight),'

c. Lišī dābái-le
    Lisi fight-defeat-PER
    'Lisi is defeated (in a fight),'

Assuming that the verb dābái 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 bā 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 yī-fǔ huà.  
Zhangsan at wall-top hang-PER one-CL painting  
'Zhangsan has hung a painting on the wall.'

b. Qiángshàng guà-le yī-fǔ 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 bā 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 bā júzǐ bō-le pí.  
Zhangsan BA orange peel-PER skin  
'Zhangsan has peeled the skin from the orange.'

b. (*bā) Júzǐ, Zhāngsān bō-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. Júzì, Zhāngsān bā pí bō-le.
   Orange Zhangsan BA skin peel-PER
   'The orange, Zhangsan has peeled off its skin.'

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

In (50a), the verb bā '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 bā 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 markers. 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 bā. Thus the use of bā 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 bā behaves semantically much like a case-marking preposition. However, syntactically, bā 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, bā cannot occur without the following NP. That is, it behaves much like a syntactic affix. This is why we believe bā 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 júzì], Zhāngsān bā tā, bō-le pí.
    that-CL orange Zhangsan BA it peel-PER skin
    'That orange, Zhangsan has peeled it off its skin.'
Even though the verb *bā* '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, *bā* is used before the anaphor since this is a non-NP position. The same is true with the verb *dāduàn* 'beat-break' in (53a).

We must understand that when we say *bā* 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, *bā* is not used; when a resumptive pronoun is used, *bā* must also occur. Thus I conclude that *bā* should be treated as a marker rather than a preposition or a verb in Chinese. This is shown in the following configuration.

(54) Treating *bā* as a case marker

```
  S
 /   \\
NP   VP
   /    \\
  Zhtagsān
 /     |
|      |
NP[bā]
|    \\
  bā Līsì dāduān-le yī tiáo tūi
```

58
3.2. Zài Constructions

We concluded in the last section that the word bā 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 zài bùzài jiā ?
     Zhāngsan at-not-at home
     'Is Zhāngsan home?'

(56)  Tā de hái zi hái zài bùzài měiguó dù 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 zài bùzài qiáng shàng 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 běn zhī shàng xiě- le jǐ- gè zi.
     he very quickly DE at notebook-top write-PER several-CL word
     'He quickly wrote a few words on the notebook.'

(59)  Tā zài shū bāo- lǐ fāng- le wú- zhī qiān bǐ.
     he at bookbag-inside place-PER five-CL pencil
     'He has put five pencils in his bookbag.'

(60)  Tā zài nèi běn zì dì xià miàn yà- 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. 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 shūbāo fú 'in the bookbag', zài does not take the phrase shūbāo fú and maps it into the space inside the bookbag. The semantic interpretation 'inside the bookbag' is already in the phrase shūbāo fú. Likewise, in the phrase zài nèi běn zìdiānxìàmiàn 'under the dictionary', zài does not take the phrase nèi běn zìdiānxìàmiàn and maps it to the space under the dictionary. The meaning of 'under the dictionary' is already in the phrase nèi běn zìdiānxìàmiàn. In later chapters, I will argue that the phrases like nèi běn zìdiānxìàmiàn and shūbāo fú 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 zìdiānxìàmiàn, it is the locational affix xiàmiàn 'under' that maps the NP nèi běn zìdiān 'that dictionary' into the space under the dictionary. Likewise, in the locational phrase shūbāo fú, the locational affix fú '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 bā in every aspect of syntax and therefore should also be treated as a marker rather than a preposition.

3.2.2. Comparison with bā
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 bā, its appearance depends on where the phrase that it combines with is located. For instance, zài

---

12 As has been discussed 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 zōuzâi, tiàodâo, 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 běnzishâng xiē-le jí-gè zì.  
he at notebook-top write.PER several-CL word  
'He has written a few words on the notebook.'

b. Běnzishâng xiē-le jí-gè zì.  
notebook-top write.PER several-CL word  
'There are a few words written on the notebook.'

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

d. Tā bā zhè jí-gè zì xiēzâi-le běnzishâng.  
he BA this several-CL word write-at.PER notebook-top  
'He has written these words on the notebook.'

e. Zhè jí-gè zì, tā xiēzâi-le běnzishâng.  
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 shūbâo-fi fàng-le wū-zhi qiânbî.  
he at bookbag-inside place.PER five-CL pencil  
'He has put five pencils in his bookbag.'

b. Shūbâo-fi fàng-le wū-zhi qiânbî.  
bookbag-inside place.PER five-CL pencil  
'There are five pencils in his bookbag.'

c. Shūbâo-fi, tā fàng-le wū-zhi qiânbî.  
bookbag-inside he place.PER five-CL pencil  
'In his bookbag he has put five pencils.'

d. Tā bā nei wū-zhi qiânbî fàngzâi-le shūbâo-fi.  
he BA that five-CL pencil place-at.PER bookbag-inside  
'He has put those five pencils in his bookbag.'

e. Nêi wū-zhi qiânbî, tā fàngzâi-le shūbâo-fî.  
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 nei-bên zìdiânxìâmiăn yâ-le shí-kúâi qián.  
he at that-CL dictionary-below press.PER ten-CL money  
'He has placed ten dollars under the dictionary.'

b. Nêi-bên zìdiânxìâmiăn yâ-le shí-kúâi qián.  
that-CL dictionary-below press.PER ten-CL money  
'There are ten dollars under the dictionary.'

that-CL dictionary-below he press.PER ten-CL money  
'He has placed ten dollars 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 bā, 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 bā when a topic dependent anaphor occurs or relativization is involved. Examine the following.

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

        b. [Běnzishàng], tā zài nèirì xiě-le jī-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 nèirì xiě-le jī-gè zì de [běnzishàng];  
           he at there write-PER several-CL word DE notebook-top  
           'the notebook that he has written a few words on.'

        d. Tā tì xiě-le jī-gè zì de [běnzishàng];  
           he write-PER several-CL word DE notebook-top  
           'the notebook that he has written a few words on.'

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

        b. [Shǔbāoji]; tā zài nèirì 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 nèirì fàng-le wǔ-zhī qiānbǐ de [shǔbāoji];  
           he at there place-PER five-CL pencil DE bookbag-inside  
           'in the bookbag where he has put five pencils.'

        d. Tā tì fàng-le wǔ-zhī qiānbǐ de [Shǔbāoji];  
           he place-PER five-CL pencil DE bookbag-inside  
           'in the bookbag where he has put five pencils.'
(66) a. Tā zài zhǐdiǎnxiàmiàn yā-le shí-kuài qián
    he at dictionary-below press-PER ten-CL money
    'He has placed ten dollars under the dictionary.'

b. [Zhǐdiǎnxiàmiàn], tā zài nèirì 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 nèirì yā-le shí-kuài qián de [Zhǐdiǎnxiàmiàn];
    he at there press-PER ten-CL money DE dictionary-below
    'Under the dictionary where he has placed ten dollars.'

d. Tā ti yā-le shí-kuài qián de [Zhǐdiǎnxiàmiàn];
    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 bā analysis. We also showed at the beginning of this section that some occurrences 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 shūbāo fāng-le wǔ-zhī qiānbī.
    he at bookbag-inside place-PER five-CL pencil
    'He has put five pencils in the bookbag.'

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

(68) a. Tā zài jiā-qi chǐ-le yī-dùn fān.
    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 fāng 'place' is a verb in (67a) and guà 'hang' in (67b). In (67a), the verb fāng 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).

     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 arguments: a theme and a location describing where the theme is located. Since the verb is the head of the locational expression, it is obligatory and structures analogous to (69) cannot happen with (68).

---

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 jiā, tā chī-le yī dān 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-bù-chāng lái jiā?
     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 bā wǔ zhī qiānbi fāngzái-le shūbāo-li
     he BA five CL pencil place-at-PER bookbag-inside
     'He has put five pencils in the bookbag.'
(70) a. *Jiātí chī-le yī-dūn 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 zàiibuzài shūbāo-fī fāng-le wù-zhī qiānbi? 
   he at-not-at bookbag-inside place-PER five-CL pencil
   Intended: 'Has he put five pencils in the bookbag?'

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

(ii) a. Nēi wù zhī qiānbi fāngzāi-le shūbāöfī .
    that five CL pencil place-at-PER bookbag-inside
    'The five pencils have been put in the bookbag.'

b. Nēi yī fū huà guāzāi-le qiángshàng.
    that one CL painting hang-at-PER wall-top
    'That painting has been hung on the wall.'

(iii) a. *Tā bā yī dūn fàn chīzāi-le jiānī.
    he BA one CL meal write-at-PER home-inside
    Intended: 'He has had one meal inside the house.'

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

(iv) a. *Nēi yī dūn fàn chīzāi-le jiānī.
     that one CL meal write-at-PER home-inside
     Intended: 'That meal was eaten inside the house.'

b. *Nēi yī nián dàxué dúzāi-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 zài bu zài qiáng shàng 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 zài bu zài jiān chí fàn?
   he at-not-at home-inside eat-PER meal
   'Does he have dinners inside the house?'

b. Tā zài bu zài Běijīng dú dà xué?
   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. Shū bāo, tā fàng le wǔ zhī qiānbǐ.
      bookbag-inside he place-PER five-CL pencil
      'In the bookbag, he has put five pencils.'

b. Qiáng shàng, 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 jiān tā zhǐ chī guǒ yī dūn fàn.
      at home-inside he only eat-PROG one CL meal
      'While in the house, he only had one meal.'

b. Zài Běijīng tā dú le yī nián dà xué.
   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 bā 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 bā 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) yì-bā daō bā nèi-gè xiguā qiéchéng-le
    he use(-PER) one-CL knife BA that-CL watermelon cut-become-PER
    liàng bàn.
    two half
    'He used a knife and cut the watermelon into halves.'

b. Tā bā nèi-gè xiguā yòng(*-le) yì-bā daō qiéchéng-le
    he BA that-CL watermelon with one-CL knife cut-become-PER
    liàng bàn.
    two half
    'He cut the watermelon into halves with a knife.'

However, when yòng is used after the bā 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 bā and zài, the NP after yòng can be relativized with a resumptive
pronoun tā/zāi15 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/tāi bā nèi-gè xiguā qiéchéng-le liàng bàn
    he with it BA that-CL watermelon cut-become-PER two half
    de [nèi-bā daō].
    DE that-CL knife
    'the knife with which he cut the watermelon into halves'

b. Tā tāi bā nèi-gè xiguā qiéchéng-le liàng bàn de [nèi-bā daō].
    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-bā daō], tā yòng lái/tāi bā nèi-gè xiguā qiéchéng-le
    that-CL knife he with it BA that-CL watermelon cut-become-PER
    liàng bàn.
    two half
    'With that knife he cut the watermelon into halves.'

b. *[Nèi-bā daō], tā tāi bā nèi-gè xiguā qiéchéng-le liàng 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. Gēi

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

(79) a. Ni gěiméigěi Lisi nèi-běn xiāoshuō?
   you give-not-give Lisi that-CL novel
   'Have you given Lisi that novel?'
   
b. *Ni gěiméigěi Lisi sòng-le nèi-běn xiāoshuō?
   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 tä 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. Lisi, wǒ sòng-le yī-běn xiāoshuō
   Lisi, I give-PER one-CL novel
   'Lisi, I have given a novel.'
   
b. [Lisi], wǒ gěi *(tä) sòng-le yī-běn xiāoshuō
   Lisi, I to he give-PER one-CL novel
   'Lisi, I have given a novel for/to him.'

(81) a. Wǒ tā sòng-le yī-běn xiāoshuō de [nèi-gè rén],
   I give-PER one-CL novel DE that-CL person
   'the person whom I have given a novel.'
   
b. Wǒ gěi *(tä) sòng-le yī-běn xiāoshuō de [nèi-gè rén],
   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, duī, etc.)
Compared with zài, yòng, and gěi, the following examples show that cónɡ 'from', duī 'concerning', and xiāng 'towards' also behave like case markers. (82a-b) show that cónɡ
does not behave like a verb. (82c) shows that công is not needed when the relative phrase is in the subject position. (83) and (80) show that công must have a host phrase to attach to when topicalization and relativization takes place.

(82) a. Tā công*(le/*-guo/*zhe) jiālǐ gěi wǒmén dàilái-le he from-PER/EXP/DUR home-inside to us bring-come-PER xùduō haochí de dōngxi many good-eat DE thing 'He has brought us many delicious things from home.'

b. *Tā cóngbucông jiālǐ gěi wǒmén dàilái-le xùduō he from-not-from home-inside to us bring-come-PER many haochí de dōngxi? good-eat DE thing
Intended: 'Has he brought us many delicious things from home.'

c. Jiālǐ gěi wǒmén dàilái-le xùduō haochí de dōngxi. home-inside to us bring-come-PER many good-eat DE thing 'We were brought many delicious things from home.'

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

b. [Jiālǐ] tā cóng nèirì dàilái-le xùduō haochí 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 tì gěi wǒmén dàilái-le xùduō haochí de dōngxi de [nèi he to us bring-come-PER many good-eat DE thing DE that gè difâng]; CL place 'the place where he has brought us many delicious things.'

b. tā cóng nèirì gěi wǒmén dàilái-le xùduō haochí de dōngxi he from there to us bring-come-PER many good-eat DE thing de [nèi gè difâng]; DE that CL place 'the place where he has brought us many delicious things.'

There is close resemblance between bā and dūi. (85) show that dūi can also trigger valence alternation and it does not behave like a verb. (86) show that in topicalization constructions, dūi 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. Zhângsâns hênh mānyî zhè-jian shì. Zhângsan very satisfy this-CL matter 'Zhângsan is satisfied with this matter.'
b. Zhāngsān dùi zhè-jian shì hěn mānyì.
Zhāngsān concerning this-CL matter very satisfy
'Zhāngsān is satisfied with this matter.'

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

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

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

b. [Zhè-jian shì], Zhāngsān dùi tā hěn mānyì.
this-CL matter Zhāngsān concerning it very satisfy
'Zhāngsān is satisfied with this matter.'

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

b. Zhāngsān dùi tā hěn mānyì de [nèi-jian shì],
Zhāngsān concerning it very satisfy DE that-CL matter
'the matter with which Zhāngsān 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 Léi Fēng learn help-people-as-pleasure DE spirit
'We learn from Léi Fēng the spirit of helping people as a pleasure.'

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

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

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

(90) a. Wǒmen tā xuéxí zhùrénwéilè de jīngshén de [nèi-gè rén],
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 tài xuéxí zhùrénwéilè de jǐngshén de [nèi we] towards he learn help-people-as-pleasure DE spirit DE that gè rén]; 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 bā construction, we find that almost all northern dialect speakers use only the bā 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 bā shū cāngzài guīziī. I BA book hide-at cupboard-inside 'I hide the book in the cupboard.'

b. Wǒ cāng shū zài guīziī. I hide book at cupboard-inside 'I hide the book in the cupboard.'

(92) a. Wǒ bā tā túidào shàfāshàng. I BA he push-to sofa-top 'I push him onto the sofa.'

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

Note that in (91) shū 'book' is the object of cāng 'hide' in both sentences, and in (92) tā 'he' is the object of túi 'push' in both sentences. The only difference in these pairs is that
with the help of ɓa the object can occur preverbally. That is, with the help of ɓa, 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

```
PP
NP       P
   Mod  N
```

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-nunu 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.

    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. Lisi bā píngguō fāngzài kuāngzīlǐ.
    Lisi BA apple place-at basket-inside
    'Lisi puts the apples inside the basket.'
b. Lisi bā nèi jī-gè hóng píngguǒ fāngzài kuāngziǐ.
Lisi BA that several-CL red apple place-at basket-inside
'Lisi puts several of those red apples inside the basket.'

c. Lisi bā diàozài diàoshàng de píngguǒ fāngzài kuāngziǐ.
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. Lisi bā cóng shùshàng diàoxiālai de píngguǒ fāngzài kuāngziǐ.
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. Lisi zài kuāngziǐ fāng-le xūduō píngguǒ.
Lisi at basket-inside place-PER many apple
'Lisi puts the apples inside the basket.'

b. Lisi zài Zhāngsàn de kuāngziǐ fāng-le xūduō píngguǒ.
Lisi at Zhangsan DE basket-inside place-PER many apple
'Lisi puts the apples inside Zhangsan's basket.'

c. Lisi zài zhūàng-le pútao de kuāngziǐ fāng-le xūduō 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. Lisi zài yòng zhúzhī biān de kuāngziǐ fāng-le xūduō 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 (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. 

```
[HEAD 3]
[SUBCAT 4]
[MARKING 1]
```

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 bā NP and zài LP\textsuperscript{17} are given below.

(100) a. the analysis of bā Lìsī

```
NP[bā]  
  bā  
  Lìsī
```

b. the analysis of zài shūbāoli

```
LP[zài]  
  zài  
  shūbāoli
```

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 bā Lìsī and Lìsī are both NPs in (96a) and the only difference between the two is that bā Lìsī is a marked NP and Lìsī is an unmarked NP. The same is true of (100b): zài shūbāoli is a marked LP and shūbāoli 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.

\textsuperscript{17} See Chapter 5 for arguments for the necessity to distinguish nominal phrases (NP) from locative phrases (LP) in Chinese.
(101) a. [Wú-gè[píngguó]_{NP}, [Zhāngsān názǒu-le  [sān-gè [pro]_{NP}]_{S}: five-CL apple Zhansan take-away-PER three-CL
'As for the five apples, Zhansan took away five of them.'

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

c. Zhāngsān [[bā [wú-gè[píngguó]_{NP}] {názǒu-le  [sān-gè [pro]_{NP}]_{VP} Zhansan BA five-CL apple take-go-PER three-CL
'Zhansan 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 wú-gè píngguó '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 tàizǐ '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 zǐjǐ 'self', the pronoun-reflexive combination tàizǐ still needs a local o-commanding binder. Compare the following.

(102) a. Zhāngsān_{i} gāosù-le Wāngwū_{j} zǐjǐ_{i,j} de fēngshu. Zhansan tell-PER Wangwu self DE score
'Zhansan has told Wangwu his score.'

b. Zhāngsān_{i} gāosù-le Wāngwū_{j} tàizǐ_{i,j} de fēngshu. Zhansan tell-PER Wangwu self DE score
'Zhansan has told Wangwu his own score.'

(103) a. Zhāngsān_{i} shuō Līsī zhídào Wāngwū_{k} bù xiǎngxīn zǐjǐ_{i,k}. Zhansan say Lisi know Wangwu not trust self
'Zhansan said Lisi knew that Wangwu did not trust himself.'

b. Zhāngsān_{i} shuō Līsī zhídào Wāngwū_{k} bù xiǎngxīn tàizǐ_{i,k}. Zhansan say Lisi know Wangwu not trust himself
'Zhansan 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 [tàizǐ_{i} de fángziǐ]_{NP}]_{VP}. Zhansan live-at himself DE house-inside
'Zhansan lives in his own house.'

b. Zhāngsān [bā Līsī_{i}]_{NP} [guānzài [tàizǐ_{i} de fángziǐ]_{NP}]_{VP}. Zhansan BA Lisi close-at himself DE house-inside
'Zhansan shuts Lisi up in his(=Lisi's) own house.'

(105) a. [Zhāngsān_{i}]_{NP} [cóng tàizǐ_{i,j} de jiā_{i}]_{VP} [bā Līsī_{i}]_{NP} [gān-le chūlái]_{VP}. Zhansan from himself DE home-inside BA Lisi chase-PER out
'Zhansan has chased Lisi out of his(Zhansan's) house.'
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 treated 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-gě rén]NP, wǒ jībùde (*bā) [tā]NP, le.  
this-CL person I remember-not BA him LE 
'As for this person, I can't remember him any more.'

b. [Zhè-gě rén]NP, wǒ zǎo *(bā) [tā]NP, 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 coindexed with zhègě rén. But in postverbal position in (106a) it appears alone, while in preverbal position in (106b), it appears with bā.

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 position (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 bā [zhuōzī]NPi shuāiduān-le pro j yi-tiao tūi.
   Zhangsan BA table throw-break-PER one-CL leg.
   'Zhangsan threw the table and one of its legs broke.'

   Zhangsan ZAI table-top throw-break-PER one-CL leg.
   'Zhangsan broke one of his legs on the table.'

c. [Zhuōzī]NPi shuāiduān-le pro yi-tiao tūi.
   table throw-break-PER one-CL leg.
   'The table was thrown and one of its legs was broken.'

d. [Zhuōzī]NPi-shāng]LPj shuāiduān-le pro j yi-tiao tūi.
   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 zhuōzī '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 bā as a preposition: PPs and NPs belong to different categories and should not be able to have binding relations. However, if we treat bā 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. Zhuōzī bèi Zhāngsān] shuāiduān-le pro j yi-tiao tūi.
   table BEI Zhangsan beat-break-PER one-CL leg
   'One of Zhangsan's legs was broken by Lisi.'

Compared to (107a), where zhuōzī 'table' is preceded by bā 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. Thus the different binding effect can be seen from the different treatment of the two words bā 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
3.4.3. Valence Alternations

I have discussed the properties of the lexical items such as bā, 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 unmarked 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 fān.
    Zhangsan eat-finish-PER meal.
    'Zhangsan has finished (eating) his meal.'

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

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

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.
b. Wômen yào xiăng Léi Féng xuéxí.
   we must towards Lei Feng learn
   'We must learn from Lei Feng.'

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

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

(4) a. Zhângsān hên mánỳì zhè jìan shì.
   Zhangsan very satisfy this CL matter
   'Zhangsan is satisfied with this matter.'

b. Zhângsān dùì zhè jìan shì hên mánỳì.
   Zhangsan concerning this CL matter very satisfy
   'Zhangsan is very satisfied with this matter.'

   Mâǐ come-EXP U.S.A.
   'Mary has been to the United States.'

b. Mâǐ dào mèiguó lái-guo.
   Mary arriving U.S.A. come-EXP
   'Mary has arrived in the United States.'

(6) a. Tângmù zòuchú shén-shān-lăo-lín lái le.
   Tângmù walk-out deep-mountain-old-forest come LE
   'Tom has walked out of the remote mountain forests.'

b. Tângmù cóng shén-shān-lăo-lín zòuchú lái le.
   Tângmû from deep-mountain-old-forest walk-out come LE
   'Tom (finally) walked out of the remote mountain forests.'

(7) a. Lìsì chângchâng chì fânguān.
   Lìsì often eat restaurent
   'Lisi often eats in restaurants.'

b. Lìsì chângchâng zài fânguān chì fàn.
   Lìsì often at restaurent eat meal
   'Lisi often eats his meals in restaurants.'

(8) a. Lìsì bù huī chì kuâizi.
   Lìsì not know-how eat chopsticks
   'Lisi does not know how to eat with chopsticks.'

b. Lìsì bù huī yòng kuâizi chì fàn.
   Lìsì 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 bènzìshàng xiěcuò-le yī gè zì.
   Lisi at notebook-top write-wrong-PER one CL word
   'Lisi wrote a wrong word on the notebook.'

b. Lisi zài bènzìshàng bā yī 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 bā yī gè zì xiěcuò-le bènzìshàng.
   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 yī dīng 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 yī dīng 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 yī dīng màozi zài qiáng-shàng
    he PROGRESSIVE hang one CL hat at wall-top
(113)  

Tā zhèng zài qiáng-shàng guà yī dīng màozi
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)  

Lìsì rènshì yī gè rén hén yōuqián.
Lìsì know one CL person very have-money
‘Lìsì knows a person who is very rich.’

Ngor notes that a small clause analysis for yī gè rén and hén yōuqián 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 yōuqián. 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).

(115)  

a.  

Nèi gè rén hén yōuqián.
that CL person very have-money
‘That person is very rich.’

b.  

Yī gè rén hén yōuqián.
one CL person very have-money
‘A person is very rich.’

(116)  

*Lìsì rènshì nèi gè rén hén yōuqián.
Lìsì 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 yōuqián, as is shown in (117).

---

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

(i)  

Tā zhèngzài zài qiáng-shàng guà yī dīng màozi
he PROGRESSIVE at wall-top hang one CL hat
‘He is just hanging the hat on the wall.’

However, due to the haploglogy 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 unacceptability of this sentence. Nor do I have any ready explanation for it.

82
Thus Ngor suggests that the best analysis is to assume that in (114) there is a null pronoun pro between *yī gē 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 dīng màozi zài qiáng-shàng.
    one CL hat at wall-top
    'A hat is on the wall.'

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

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

(120) Lìsī gùa-le yī dīng màozi tā zài qiáng-shàng
    Lìsī 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 analysis) 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. Lìsī gěi wǒ sòng-le yī-bēn shū.
    Lisi to I give-PER one-CL book
    'Lisi has given a book to me.'

    b. Lìsī sòng-le yī-bēn 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. However, the following examples suggest that they involve different structures.

(122) a. Lìsī 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. Lìsī zuò-le [yǐ-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.'

---

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

    Lisi cook-PER one-CL meal give I

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(-ality). In (122) wān 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, dūn 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 gēi 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. Lishi gēi-le wǒ yī-wān mián.
    Lisi give-PER me one-CL noodle
    Lisi has given me a bowl of noodles.'

    b. *Lishi gēi-le wǒ yī-dūn 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 gēi wǒ in (122). I propose that there is an empty category after wǒ in the phrase gēi wǒ that is coindexed with the postverbal NP, hence explaining the unacceptability of (123b) the same way as that of (124b): after gēi wǒ 'give me', there is an empty category that is coindexed with yī dūn fàn, an NP with a verbal classifier. Since the verb gēi 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; to give me _i. This line of analysis is confirmed when we use the verb chí 'eat' instead of the phrase gēi wǒ.

(125) a. Lishi zuò-le yī wān mián chí
    Lisi cook-PER one CL noodle eat
    Lisi has cooked a bowl of noodles to eat.'

    b. Lishi zuò-le yī dūn fàn chí.
    Lisi cook-PER one CL noodle eat
    Lisi has cooked a meal for me to eat.'

(126) a. Wǒ chí-le yī wān mián.
    I eat-PER one CL noodle
    I have had a bowl of noodles.'

    b. Wǒ chí-le yī dūn fàn.
    I eat-PER one CL meal
    I have had a meal.'
Note that *chî '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 *gēî 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 *gēî 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 bā shūjiā bāimǎn-le shū.
    zhāngsān BA bookshelf place-full-PER book
    ‘zhāngsān has filled the bookshelf full of books.’

    b. zhāngsān bā shū bāimǎn-le shūjiā.
    zhāngsān BA book place-full-PER bookshelf
    ‘zhāngsān has filled the books onto bookshelves.’

In (1), the verb bāimǎn 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 following.

(2) a. zhāngsān [bā júzi]NP bō-le [pǐ]NP.
    zhāngsān BA orange peel-PER skin
    ‘zhāngsān has peeled the orange of its skin.’

    zhāngsān BA skin peel-PER orange

    c. zhāngsān bō-le [yì-gè júzi]NP.
    zhāngsān peel-PER one-CL orange
    ‘zhāngsān has peeled an orange.’

    d. zhāngsān bō-le [júzi (de) pǐ]NP.
    zhāngsān peel-PER orange DE skin
    ‘zhāngsān has peeled the orange skin.’

    e. zhāngsān bā [júzi (de) pǐ]NP bō-le.
    zhāngsān BA orange DE skin peel-PER
    ‘zhāngsān has peeled the orange skin.’

86
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 pī can serve as the unmarked complement.

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

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

   b. *Yī-fū huà guà-le Zhāngsān.
      one-CL painting hang-PER Zhangsan

(4) a. Qiángshāng guà-le yī-fū huà.
    wall-top hang-PER one-CL painting
    'There is a painting hanging on the wall.'

   b. *Yī-fū huà guà-le qiángshāng.
      one-CL painting hang-PER wall-top

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

   b. *Qiángshāng zài/bā Zhāngsān guà-le yī-fū 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 arguments 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. Qiángshāng běi Zhāngsān guà-le yī-fū 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 běi 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 Hierarchical 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 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:
   rènshì wǒ de nèi-ge rén
   'the person who recognizes me'
   recognize I REL that-CL person

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'

b. Relativization of the Indirect Object:
   wǒ gěi-le (tāi) yī-ben shū de nèi-ge rén
   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 nèiér ) guà-le yī-fu huà de qiángshāng
   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:
   (tāi de) xiàmiàn yà-le wū-kuài qián de nèi-ben shū
   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 tāi gāo de nèi-ge rén
   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 bā júzi bō-le pí.  
   Zhangsan BA orange peel-PER skin  
   'Zhangsan has peeled the skin off the orange.'

      Zhangsan BA orange peel-PER REL skin  
      Intended: 'the skin that Zhangsan peeled off the orange'

   c. bā 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 bā qiānbi fāngjūn-le shūbāo.  
      Zhangsan BA pencil put-into-PER bookbag  
      'Zhangsan has put the pencil into the bookbag.'

   b. *Zhāngsān bā qiānbi fāngjūn-le de shūbāo.  
      Zhangsan BA pencil put-into-PER REL bookbag  
      Intended: 'the bookbag that Zhangsan has put the pencil into'

   c. bā qiānbi fāngjūn-le shūbāo de Zhāngsān  
      BA pencil put-into-PER bookbag REL Zhangsan  
      'Zhangsan, who has put the pencil into the bookbag.'

   d. Zhāngsān fāngjūn-le shūbāo de qiānbi  
      Zhangsan put-into-PER bookbag REL pencil  
      'the pencil that Zhangsan has put into the bookbag.'

      Zhangsan ZAI bookbag-inside put-PER five-CL pencil  
      'Zhangsan has put five pencils into the bookbag.'

   b. *Zhāngsān zài shūbāo li fāng-le de nēi wǔ-zhī qiānbi.  
      Zhangsan ZAI bookbag-inside put-PER REL that five-CL pencil  
      Intended: 'five pencils that Zhangsan has put into the bookbag.'

   c. Zài shūbāo li fāng-le wǔ-zhī qiānbi de Zhāngsān.  
      ZAI bookbag-inside put-PER five-CL pencil REL Zhangsan  
      'Zhangsan, who has put five pencils into the bookbag.'

   d. Zhāngsān fāng-le wǔ-zhī qiānbi de shūbāo li.  
      Zhangsan put-PER five-CL pencil REL bookbag-inside  
      'in the bookbag where Zhangsan has put five pencils.'

In (9), pi '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-zhī qiānbi '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 should 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.

   Zhangsan he BA orange peel-PER skin
   'As for Zhangsan, he has peeled the skin off the orange.'

   b. Júzì, Zhāngsān (bā tā) bō-le pí.
   orange Zhangsan BA it peel-PER skin
   'As for the orange, Zhangsan has peeled its skin off.'

   skin Zhangsan BA orange peel-PER it

(14) a. Zhāngsān, tā bā qiānbǐ fāngjīn-le shūbāo.
   Zhangsan he BA pencil put-into-PER bookbag
   'As for Zhangsan, he has put the pencil into the bookbag.'

   b. Qiānbǐ, Zhāngsān (bā tā) fāngjīn-le shūbāo.
   pencil Zhangsan BA it put-into-PER bookbag
   'As for the pencil, Zhangsan has put it into the bookbag.'

   c. *Shūbāo, Zhāngsān bā qiānbǐ fāngjīn-le (tā).
   bookbag Zhangsan BA pencil put-into-PER it

   Zhangsan he ZAI bookbag-inside put-PER five-CL pencil
   'As for Zhangsan, he has put five pencils into the bookbag.'

   b. Shūbāo lǐ, Zhāngsān fāng-le wǔ-zhī qiānbǐ.
   bookbag-inside Zhangsan put-PER five-CL pencil
   'in the bookbag Zhangsan has put five pencils.'

   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.

   SHI Zhangsan BA orange peel-PER skin
   'it is Zhangsan who has peeled the skin off the orange.'

   Zhangsan SHI BA orange peel-PER skin
   'It is the orange that Zhangsan has peeled the skin.'
c. *Zhâng sânp bâ jû zì bô-le shí péi.
   Zhangsan BA orange peel-PER SHI skin
   Intended: 'it is the skin that Zhangsan has peeled off the orange.'

(17) a. Shí Zhâng sânp bâ qiânbì fâng-jîn-le shûbâo.
   SHI Zhangsan BA pencil put-into-PER bookbag
   'It is Zhangsan who has put the pencil into the bookbag.'

b. Zhâng sânp shí bâ qiânbì fâng-jîn-le shûbâo.
   Zhangsan SHI BA pencil put-into-PER bookbag
   'It is the pencil that Zhangsan has put into the bookbag.'

c. *Zhâng sânp bâ qiânbì fâng-jîn-le shi shûbâo.
   Zhangsan BA pencil put-into-PER SHI 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
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$_i$.
    d. Larry$_i$ knows that John$_j$ admires himself$_j$.
    e. The teachers$_i$ wondered whether the students$_j$ met each other$_j$.

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 accessibility 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 continuum 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. Zhāngsānǐ bā Lǐshǐ jièshào'gei tāzhījīwǒjī.
Zhangsan BA Lisi introduce-to himself
'Zhangsan introduced Lisi to himself.'

b. Zhāngsānǐ bā tāzhījīwǒjī jièshào'gei Lǐshǐ.
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 bā is treated as a preposition, bā Lisi
does not c-command tājī, a local reflexive pronoun, and therefore (22a) cannot be explained. With our analysis where bā is treated as a marker and a flat VP structure is assumed, bā tājī and Lǐ c-command each other in (22b) and therefore their disjoint reference cannot be explained. The following are more examples like (22).

(23) a. Lǐ Xiāojíe; gēi Wāng Xīǎnsēngjǐ miáoshū tājījījǐ.
   Li Miss for Wang Mister describe him/herself
   'Ms Li describes herself for Mr Wang/Mr Wang for himself.'

   b. Lǐ Xiāojíe; gēi tājījǐjǐ miáoshū Wāng Xīǎnsēngjǐ.
   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, independent existence) and therefore must be selected for the subject. The unacceptability of (24b)

---

4 In a passive sentence, the most agent-like argument is not lexically realized (suppressed according to relational grammar), and therefore is not on the SUBCATE list, thus does not participate in the argument selection.
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
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 especially 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 thematic 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. Instead, it may well be expected that the two sets of
proto-role properties arrange the arguments into a hierarchy and the two on each end of the
hierarchy will be selected to fulfill 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 kěyì zài fǎnqǐnǐ yòng kuàizi chī fàn.
   Zhangsan may at restaurant-inside use chopsticks eat meal
   'Zhangsan may eat his meal with chopsticks in a restaurant.'

---

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.
b. *Fànguǎnli kèyì bèi Zhāngsān yòng kuàizi chī fàn.
    restaurant-inside may by Zhangsan use chopsticks eat meal

c. *Kuàizi kèyì zài fànguǎnli bèi Zhāngsān chī fàn.
    chopsticks may at restaurant-inside by Zhangsan eat meal

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 sentence) 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 unacceptability 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 kèyì 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-quito fàn kèyì 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-quito fàn kèyì 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 kēyi zài fānguānli 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 subject is fully acceptable when fānguānli 'in a
restaurant' is absent. This is shown in (29) bellow.

(29) a. Kuàizi kēyi chī fàn.
    chopsticks may eat meal
    '(Someone) may eat his meal with chopsticks.'

    b. Fānguānli kēyi 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 tiàntiān zài fānguān 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 tiàntiān zài fānguān bā fàn chī kuàizi.
    Zhangsan day-day at restaurant BA meal eat chopsticks

c. *Zhāngsān tiàntiān bā fàn yòng kuàizi chī fānguān.
    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, fān
'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), fān 'meal' possesses the most proto-patient properties and
thus qualifies as the choice for the object. But what if fān '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 fān 'meal' in (30), we should expect kuàizi 'chopsticks' to fill the
object 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 fānguān chí kuāizi.
Zhāngsān day-day at restaurant eat chopsticks
'Zhāngsān eats with chopsticks in a restaurant everyday'
b. *Zhāngsān tiāntian yòng kuāizi chí fānguān.
Zhāngsān day-day use chopsticks eat restaurant
Intended: 'Zhāngsān eats with chopsticks in a restaurant everyday'

In this analysis, the location NP (which has the proto-patient properties of being stationaryelative to another participant) can serve as the object only when the instrument NP is also
missing. This is, again, confirmed by the following examples.

Zhāngsān day-day eat restaurant
'Zhāngsān eats in a restaurant everyday.'
b. Zhāngsān tiāntian chí kuāizi.
Zhāngsān day-day eat chopsticks
'Zhāngsān 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 hierarchy 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.

Zhangsan for me take-come-PER one-CL apple  
'Zhangsan has taken an apple for me.'

b. Zhāngsān bā píngguǒ gěi wǒ ná lái-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 dā duàn-le Līsī de yī-tiáo tū.  
Zhangsan hit-break-PER Lisi DE one-CL leg  
'Zhangsan has broken Lisi's one leg.'

b. Zhāngsān bā Līsī dā duàn-le yī-tiáo tū.  
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 bā píngguǒ and appears before the verb nálái-le. In (36a), the object is Līsī de yī-tiáo tūi 'Lisi's one leg', and in (36b), the object is yī-tiáo tūi 'one leg', and Līsī de 'Lisi's' become bā Līsī and appears before the verb dā-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 Līsī 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 bā 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 Sportiche 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 nàzōu-le sān-gè píngguǒ. 
   Zhangsan take-go-PER three-CL apple
   'Zhangsan has taken away three apples.'

b. Zhāngsān bā píngguǒ nàzōu-le sān-gè. 
   Zhangsan BA apple take-come-PER three-CL
   'Zhangsan has taken away three of the apples.'

c. Zhāngsān bā wǔ-gè píngguǒ nàzōu-le sān-gè. 
   Zhangsan BA five-CL apple take-come-PER three-CL
   'Zhangsan has taken away three of the five apples.'

   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 bā 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 bā is a full NP and this NP forms a marked complement with the marker bā. 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)

\[ \text{NP} \]

\[
\text{PHON } (\text{sān - gē})
\]

\[
\text{SYNSEM|LOC|CAT|HEAD } \text{SPEC } \text{N } \text{NUM plural SHAPE ge} \]

\[
\text{PHON } (\text{null})
\]

\[
\text{SYNSEM|LOC|CAT } \text{HEAD N' INDEX [1] SUBCAT (Specifier)}
\]

With the structure of sān-gē in (38), the structures of (37b) and (37c) are given as (39b) and (39c) below, respectively.

(39) a  Zāngsān názōu-le [sān-gē [píngguō]_{NP}.

Zhangsan take-away-PER three-CL

'Zhangsan took three of the apples away.'

b  Zāngsān bā [[píngguō]_{NP} názōu-le [sān-gē[pro']_{NP}.

Zhangsan BA apple take-away-PER three-CL

'Zhangsan took three of the apples away.'

c  Zāngsān bā [wū-gē[ píngguō]_{NP} názōu-le [sān-gē[pro']_{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 názōule '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  *Zāngsān bā [sān-gē [píngguō]_{NP} názōu-le [wū-gē[pro']_{NP}.

Zhangsan BA three-CL apple take-away-PER five-CL

101
The traditional approach 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), wù-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 píngguǒ 'three apples' is placed before the whole-denoting NP wù-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 názōu-le [[píngguǒ]_{NP}.  
Zhangsan take-away-PER apple
'Zhangsan took the apples away.'

c. Zhāngsān názōu-le [wú-gè [ píngguǒ]_{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, confirming the argument selection principle. Examine the following.

(42) b. [[Píngguǒ]_{NP} názōu-le [sān-gè [pro']_{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.
Some other attempts have been made in recent literature to explain the word order in (39). For instance, Gao (1993) states that a bā-phrase is a kind of adverbal 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 bā 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 bā. 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 bā. 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 bā 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 názōu 'take away' in (39a) is that for some y, y a person named Zhanhsan, 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 názōu 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 bā, the historic use of bā is always quoted as to mean 'hold something and do something to it' (Li and Thompson 1981). That is, the historic use of bā as a verb has a meaning similar to the so-called preposition bā in contemporary Chinese and therefore it is the word bā 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 názōu-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 bā sān-ge názōu-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 bā is needed. But the sentence still treats wǔ-ge píngguǒ as the partially affected theme. This is because, as I have argued in Chapter 3, the word bā 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 bā.

As the translation shows, although bā indicates that sān-ge is a totally affected theme, wǔ-ge píngguǒ is still the partially affected theme even when it is not marked by bā. Thus, it is shown that bā does not change the semantics of an argument, as we have shown in Chapter 3. Thus the applied theme analysis of bā 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 structured 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.'
   Zhangsan BA orange DE skin peel-PER
   'Zhangsan has peeled the skin off the orange.'
   Zhangsan BA orange peel-PER skin
   'Zhangsan has peeled the skin off the orange.'

(45) a. Lǐsī shuāiduàn-le [dèngzi de yītiáo tuǐ]NP.
   Lisi throw-break-PER stool DE one-CL leg
   'Lisi has broken one of the stool's legs.'
   Lisi BA stool DE one-CL leg throw-break-PER
   'Lisi has broken one of the stool's legs.'

104
c. Lisi bā [dèngzi]NP shuāiduàn-le [yītiáo 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 bā -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. Tūfēi shāsī-le Zhāngsān de fūqīn.
Bandits kill-die-PER Zhangsan DE father
'The bandits have killed Zhangsan's father.'

b. Tūfēi bā Zhāngsān de fūqīn shāsī-le.
Bandits BA Zhangsan DE father kill-die-PER
'The bandits have killed Zhangsan's father.'

c. *Tūfēi bā Zhāngsān shāsī-le fūqīn.
Bandits BA Zhangsan kill-die-PER father

(47) a. Lisi jiězòu -le wǒ de yībēn shū.
Lisi borrow-go-PER I DE one-CL book
'Lisi has borrowed a book from me.'

b. Lisi bā wǒ de yībēn shū jiězòu -le.
Lisi BA I DE one-CL book borrow-go-PER
'Lisi has borrowed a book from me.'

c. *Lisi bā wǒ jiězòu -le yībēn 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 bā-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 yī-ge júzi.
    Zhangsan peel-PER one-CL orange
    'Zhangsan has peeled an orange.'

    b. Zhāngsān bā nèi-ge júzi bō-le pí.
    Zhangsan BA that-CL orange peel-PER skin
    'Zhangsan has peeled the skin off the orange.'

    c. *Zhāngsān bā pí bō-le yī-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 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.\textsuperscript{10} The following examples show that the two complements in each sentence have the FIGURE-GROUND relation. (Talmy 1985)

(49) a. Tā bā zhuōzìshànɡ bāi-le yi-duo huā.
   he BA table-top place-PER one-CL flower
   'He placed a flower on the table.'

   b. *Tā bā yi-duo huā bāi-le zhuōzìshànɡ.
       he BA one-CL flower place-PER table-top

(50) a. Tā bā shūjì à bǎi-le jì-ben zìdiàn.
   he BA bookshelf place-PER several-CL dictionary
   'He has placed a few dictionaries on the bookshelf.'

   b. *Tā bā jì-ben zìdiàn bǎi-le shūjì à.
       he BA several-CL dictionary place-PER bookshelf

It has been argued in the literature that in Chinese a bā-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 zhuōzìshànɡ '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 shūjì à 'the bookshelf' can be the GROUND and therefore jì-ben zìdiàn '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 jì-ben zìdiàn '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.\textsuperscript{11} This prediction is borne out in (1), repeated here as (52), and (53).

\textsuperscript{10} Size is only one of the properties that distinguish GROUND from FIGURE.

\textsuperscript{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 -màn 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 incremental theme (Dowty 1989).
(52) a. Zhāngsān bā shūjià bāimān-le shū.  
Zhangsan BA bookshelf place-full-PER book  
'Zhangsan has filled the bookshelf full of books.'

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

(53) a. Tā bā zhuōzi bāimān-le xiānhuā.  
he BA table place-full-PER fresh-flower  
'He has covered the table full of fresh flowers'

b. Tā bā xiānhuā bāimān-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 -mān '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 názōu-le in (54a) is given as (54b) below.

(54) a. Lìsī bā wǔ-gè píngguǒ názōu-le sān-gè.  
Lisi BA five-CL apple take-go-PER three-CL  
'Lisi has taken away three of the five apples.'
Please note that (54b) is an underspecified lexical entry for the verb názoú-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, the last (the right-most) argument 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 argument\(^{13}\) is marked by bā, a LOCATION argument is marked by zài, a SOURCE argument is marked by cónɡ, an INSTRUMENTAL argument is marked by yònɡ, a DESTINATION argument is marked by dào, a DIRECTION argument is marked by wāng, 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 hierarchy 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).

Zhangsan BA five-CL apple take-away-PER three-CL apple
'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 ba wū-gē pīngguō in (58) is a legitimate binder for the pro’ in the object position. Thus the acceptability 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.

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.

five-CL apple rot-PER three-CL apple
'Three of the five apples have rotted.'

five-CL rot-PER three-CL apple
'*Three apples of the five have rotted.'

this-basket compared-to that-basket more
[sān-gē[ pro’]I]N]NP.
three-CL apple
'There are three more apples in this basket than in that one.'

this-basket compared-to that-basket apple more
[sān-gē[ pro’]I]N]NP.
three-CL apple
'*There are three more apples in this basket than in that one.'
Thus coindexing facts support the argument hierarchy analysis.

The next case concerns so-called inalienable object examples discussed earlier. We repeat the examples below.

Zhangsan peel-PER orange DE skin
'Zhangsan has peeled the skin of the orange.'
b. Zhāngsān bā júzi bō-le pí.  
Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the skin off the orange.'
c. *Zhāngsān bā pí bō-le júzi.  
Zhangsan BA skin peel-PER orange

(63) a. Lìsī shuāiduān-le dēngzǐ de yìtiáo tūi.  
Lisi throw-break-PER stool DE one-CL leg
'Lisi has broken one of the stool’s legs.'
b. Lìsī bā dēngzǐ shuāiduān-le yìtiáo tūi.  
Lisi BA stool throw-break-PER one-CL leg
'Lisi has broken one of the stool’s legs.'
c. *Lìsī bā yìtiáo tūi shuāiduān-le dēngzǐ.  
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 yì-tiáo tūi 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 bā-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 position must be bound by the bā-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 argument 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) Lisi 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. Lù Zhīshēng quán-dā Zhēng 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).'</n
   c. Máo Zědōng pāo-dā shīnǐngbù.
      Mao Zedong cannon-attack headquarters
      'Mao Zedong attacks the (enemy) headquarters with cannon (fire).'</n
      PLA move-troops Sichuan
      'The PLA moves its troops to Sichuan (province).'</n
   b. Wǒ hěn dān-xīn zhè-jiān shì.
      I very hold-heart this-CL matter
      'I am very concerned about this matter.'

   c. Shíwàn zhēnqín lùdù Sīxià hú.
      ten-ten-thousand treasure-bird fall-home Sichuan lake
      'Hundreds of thousands of rare birds now make Sichuan Lake their home.'

In (66) it is the instrumental role rather than the patient that has been incorporated 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 Lǐsī yī-bēn shū.
      I give-PER Lisi one-CL book
      'I gave Lisi a book.'

   b. *Lǐsī (bèi wǒ) sòng-le yī-bēn shū.
      Lisi BEI I give-PER one-CL book
      'Lisi was given a book by me.'

   c. Néi-béi shù (bèi wǒ) sòng-le Lǐsī.
      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.\footnote{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.} Consider the following examples.

(69) a. Dàjia sòng-le Zhōusān yì-ge chuòhào.  
    people give-PER Zhousan one-CL nickname  
    'People gave Zhousan a nickname.'

b. Zhōusān bèi dàjia sòng-le yì-ge chuòhào.  
    Zhousan by people give-PER one-CL nickname  
    'Zhousan was given a nickname by (his) people.'

c. *Yì-ge chuòhào bèi dàjia sòng-le Zhōusān.  
    one-CL nickname by people give-PER Zhousan

(70) a. Jīngchá fā-le Zhāngsān sānshí-kùài qián.  
    police punish-PER Zhangsan thirty-CL money  
    'Police fined Zhangsan thirty dollars.'

b. Zhāngsān bèi jīngchá fā-le sānshí-kùài qián.  
    Zhangsan by police punish-PER thirty-CL money  
    'Zhangsan was fined thirty dollars by the police.'

c. *Sānshí-kùài qián bèi jīngchá fā-le Zhāngsān.  
    thirty-CL money by police punish-PER Zhangsan

(71) a. Nèi-ge jiāhuò pō-le Zhāngsān yì-shēng shūì.  
    that-CL guy spill-PER Zhangsan one-CL water  
    'That guy spilled water all over Zhangsan.'

b. Zhāngsān bèi nèi-ge jiāhuò pō-le yì-shēng shūì.  
    Zhangsan by that-CL guy spill-PER one-CL water  
    passive of 'That guy spilled water all over Zhangsan.'

c. *Yì-shēng shūì bèi nèi-ge jiāhuò 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 exchangeable with a preverbal marked complement.
(68) d. Wǒ gěi Lǐsī sòng-le yī-ben shū.
I GEI Lisi give-VOC one-CL book
'I have sent a book to/for Lisi.'

e. *Wǒ gěi/bā yī-ben shū sòng-le Lǐsī.15
   I GEI/BA one-CL book give-VOC Lisi

(69) d. Dàjia gěi Zhōusān sòng-le yì-ge chuòhào.
   people GEI ZhouSan give-VOC one-CL nickname
   'People gave ZhouSan a nickname.'

e. *Dàjia gěi/bā yì-ge chuòhào sòng-le Zhōusān.
   people GEI/BA one-CL nickname give-VOC ZhouSan

(70) d. Jīngchá bā Zhāngsān fā-le sānshí-kuài qián.
   police BA ZhangSan punish-VOC thirty-CL money
   'The police fined ZhangSan thirty dollars.'

e. *Jīngchá bā sānshí-kuài qián fā-le Zhāngsān.
   police BA thirty-CL money punish-VOC ZhangSan

(71) d. Nèi-ge jiāhuò bā Zhāngsān pò-le yī-shēng shuǐ.
   that-CL guy BA ZhangSan spill-VOC one-CL water
   'That guy spilled water all over ZhangSan.'

e. *Nèi-ge jiāhuò bā yī-shēng shuǐ pò-le Zhāngsān.
   that-CL guy BA one-CL water spill-VOC 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.

15 It is pointed out to me (Carl Pollard, personal communication) that a more acceptable paraphrase of (68e) is the following.

(i) Wǒ bā nèi-ben shū sònggěi-le Lǐsī.
   I BA that-CL book give-give-VOC 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 yī-ben shū.
   I give-VOC one-CL book
   'I have given (someone) a book.'

(iii) Nèi-ben shū gěi-le Lǐsī.
   that-CL book give-VOC 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 Lìsī.
    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 fāng zài zhuōzǐ-shàng.
    book put at desk-top
    'The book is (put) on the desk.'

b. Zhuōzǐ-shàng fānɡ-zhe shū.
    desk-top put-DUR book
    'There are books (put) on the desk.'

(74) a. Zhāngsān tānɡ zài shāfā-šānɡ.
    Zhangsan lie at sofa-top
    'Zhangsan lies on the sofa.'

b. Shāfā-šānɡ tānɡ-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 zhuōzǐ-shàng and in (74a) it is zài shāfā-šānɡ. As in traditional analyses, zhuōzǐ-shàng and shāfā-šānɡ are treated as NPs (see Li and Thompson 1981 and Li 1985).

Huang argues that fānɡ and tānɡ 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 bā shū fāng *z̀ài) zhūòzi-shàng.
    Zhangsan BA book put at desk-top
    ‘Zhangsan put the book on the table.’

b. Shù bèi Zhāngsān fāng *z̀ài) zhūòzi-shàng.
    book BEI Zhangsan put at desk-top
    ‘The book was put on the table by Zhangsan.’

c. *Zhūòzi-shàng bèi Zhāngsān bā shū fāng (z̀ài).
    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 fāng zài zhūòzi-shàng.
    book put at desk-top
    ‘The book is (put) on the desk.’

b. Zhūòzi-shàng fāng-zhe shù.
    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 shù 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 shù 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 zhūòzi-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 zhūòzi-shàng. However, the following examples show that zài is neither a preposition nor a verb. It is actually a part of the compound verb fāngzài.

(76) a. Shū fāng zài-le zhūòzi-shàng.
    book put at-PER desk-top
    ‘The book has been put on the desk.’

118
   book put-PER at desk-top
(77) a. Zhāngsān bā shū fāng zài-le zhūōzi-shàng.
   Zhangsan BA book put at-PER desk-top
   'Zhangsan has put the book on the desk.'

b. *Zhāngsān bā shū fāng-le zài zhūōzi-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 bù/*méiyǒu zài jiāli.
   he no/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 fāngzài. 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 fāngzài 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 fāng. 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.
   book put-at desk-top
   'The book is (put) on the desk.'

   desk-top put-at book
   Intended: 'On the desk is (put) a book.'
(80) a. Zhūōzi-shàng fāng-zhe shū.
   desk-top put-DUR book
   'There are books (put) on the desk.'

   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 fāng-zài.
    book put-at

        desk-top put-at

(82) a. *Zhūōzi-shàng fāng-zhe.
        desk-top put-DUR

    b. *Shū fāng-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 Lǐsī sòng-le yī-ben shū.
        Zhngsng sng-le y-bn shu g Lsi.
    Znhgsn to Lsi send-PER one-CL book
    'Zhangsan has sent a book for/to Lisi.'

    b. Zhāngsān sòng-le yī-ben shū gěi Lǐsī.
        Zhngsng sng-le y-bn shu g Lsi.
    Znhgsn send-PER one-CL book to Lsi
    '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 māi-le yī-bèn shū gěi Līsī. Zhnagsan send-PER one-CL book give Lisi 'Zhangsan has bought a book to give to 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. Zhāngsān māi-le yī-bèn shū sòng Līsī. Zhnagsan send-PER one-CL book give Lisi 'Zhangsan has bought a book to give to 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 suppressed from the the original verb, the next most-agent like NP/LP will take the subject position. The same holds true with the suppression 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 bāi-le yì-fù huà.
Zhangsan at table-top place-PER one-CL painting
'Zhangsan has placed a painting on the table.'

b. Zhuōzi-shàng bāi-le yì-fù huà.
table-top place-PER one-CL painting
'There is a painting placed on the table.'

(88) a. Zhāngsān xǐhuān zài fānguǎn chī fàn.
Zhangsan like at restaurant eat meal
'Zhangsan likes to have his meal in a restaurant.'

b. Zhāngsān xǐhuān chī fānguǎn.
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 bā yì-fù huà bāizāi-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 always 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 qiè ‘chop’ are all well-formed.

(1)

   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 kěyì yòng mātídāo qiè cài.
   Zhangsan can YONG horse’s hoof-knife chop vegetable
   ‘Zhangsan can chop vegetables with a horse’s hoof shaped knife.’

c. Zhāngsān kěyì zài mùshāo-li qiè cài.
   Zhangsan can ZAI wood-ladle-inside chop vegetable
   ‘Zhangsan can chop vegetables in a wooden ladle.’
d. Zhāngsān kěyì qiě 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, mùshāo-li will take the subject position.

(2) a. Mùshāo-li kěyì yòng mātidāo qiě 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. Mùshāo-li kěyì qiě cài.
    wood-ladle-inside can chop vegetable
    'Vegetables can be chopped in a wooden ladle.'

<table>
<thead>
<tr>
<th>PHON (qié)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT [HEAD verb]</td>
</tr>
<tr>
<td>SUBCAT [LP[mùshāo - li], (NP[mātidāo], NP[cài])]</td>
</tr>
<tr>
<td>SYNSEM[LOCAL]</td>
</tr>
<tr>
<td>[RELATION cut]</td>
</tr>
<tr>
<td>CUTTER 1</td>
</tr>
<tr>
<td>CUT 4</td>
</tr>
<tr>
<td>LOCATION 2</td>
</tr>
<tr>
<td>INSTRUMENT 3</td>
</tr>
</tbody>
</table>

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 mātidāo.

(3) a. Mātidāo kěyì qiě cài.
    Horse's hoof-knife can chop vegetable
    'A horse's hoof shaped knife can be used to chop vegetables.'

<table>
<thead>
<tr>
<th>PHON (qié)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAT [HEAD verb]</td>
</tr>
<tr>
<td>SUBCAT [NP[mātidāo], NP[cài]]</td>
</tr>
<tr>
<td>SYNSEM[LOCAL]</td>
</tr>
<tr>
<td>[RELATION cut]</td>
</tr>
<tr>
<td>CUTTER 1</td>
</tr>
<tr>
<td>CUT 4</td>
</tr>
<tr>
<td>LOCATION 2</td>
</tr>
<tr>
<td>INSTRUMENT 3</td>
</tr>
</tbody>
</table>
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 yǐjīng zài zhuōzhi-shāng bāihāo-le cānju.  
Zhangsan already ZAI table-top set-good tableware  
'Zhangsan has already set up the tableware on the table.'

b. Zhāngsān yǐjīng bāihāo-le cānju.  
Zhangsan already set-good tableware  
'Zhangsan has already set the tableware.'

c. Zhāngsān yǐjīng bāihāo-le zhuōzì.  
Zhangsan already set-good table  
'Zhangsan has already set the table.'

d. *Zhāngsān yǐjīng bā cānju bāihāo-le zhuōzì-(shāng).  
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 bā zījī de dàyì guàzāi-le yǐjià-shāng.  
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-shāng guàzāi-le zījī de dàyì.  
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-te 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 -tì ‘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.

    that-CL table-top only have three-CL book  
    'There are only three books on that table.'

       b. Nèi-zhang zhuōzi zhī yǒu sān-tiao tūi.    
    that-CL table only have three-CL leg    
    'That table only has three legs.'

(7) a. Zhāngsān mǎi-le yì-jī ēr fāngguǎn.  
    Zhangsan buy-PER one-CL restaurant  
    'Zhangsan has bought a restaurant.'

    Zhangsan live-at one-CL restaurant-inside  
    'Zhangsan lives in a restaurant.'

1 Typical locatives in Chinese have suffixes such as -tì ‘inside’, -wài ‘outside’, -shàng ‘on top’, -xià ‘beneath’, etc. which I will treat as locative markers. But place nouns such as Béijīng ‘Beijing’, Níyǔ ‘New York’ etc. can function as locatives without such markers. In fact, expressions such as *Béijīng-tì ‘inside Beijing’, Níyǔ-yù-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 complements.

(8) a. Lisi zài shìtáng-ǐ chī fàn.
   Lisi at dining-hall-inside eat meal
   'Lisi eats his meal inside the dining hall.'

b. Lisi zài shìtáng 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. Fānguǎn-ǐ de rén hěn duó.
    restaurant-inside DE people very many
    'There are a lot of people in the restaurant.'

b. Lisi de péngyǒu hěn duó.
   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. Xūshèng-shìtáng-ǐ lái-le yì-wèi xīn jǐnglǐ.
    student-dining-hall-inside come-PER one-CL new manager
    'There is a new manager inside the student dining hall.'

b. Xūshèng-shìtáng lái-le yì-wèi xīn jǐnglǐ.
   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 Xūshèng-shìtáng-ǐ and Xūshèng-shìtáng alone does not seem to give a very adequate explanation for the different interpretations in (10), and we therefore need to distinguish them syntactically. 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. Zhuōzǐ-shàng de shū hěn duō.
    table-top DE book very many
    'There are a lot of books on the table.'

    b. Zhāngsān de shū hěn 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 Zhāngsān 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. Xuēshēng-men zài xuēshēng-shìtāng chī fàn.
    student-Plural ZAI student-dining-hall eat meal
    'Students have their meals in a student dining hall.'

    b. Zhāngsān zài xuēshēng-shìtāng-ǐ 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
Xuēshēng-shìtāng-ǐ and Xuēshēng-shìtāng.

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.

    Zhangsan jump-at-PER table-top.
    'Zhangsan has jumped onto the table.'

    b. *Zhāngsān tiàozài-le zhuōzǐ.
    Zhangsan jump-at-PER table.

(14) a. Zhāngsān bāihāo-le zhuōzǐ.
    Zhangsan set-good-PER table.
    'Zhangsan has set up the table.'

    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 -št as in jišt-št 'inside the home', cangšt-št 'inside the restaurant', and shubšt-št 'inside the bookbag', -shěng as in zhuozšt-št 'on the table', dibšt-št 'on the floor', and qingtšt-št 'on the wall', -xi as in sh-it-xi 'under the tree', chuangšt-xi 'under the bed', and yangguang-xi 'in/under the sunshine', and zhong as in renqunzhong 'among the crowd', shulinzhong 'amidst the trees', and baigmzhong 'amidst the busy schedules'. Other endings that we often see include -bi 'along the side of', -wái 'outside', pàng 'on the side of'. The following examples illustrate the occurrences of LPs with these endings.

(15) a. Chitangpàng yö yit-sengštshu. pond-side have one-CL pine-tree
'There is a pine tree on the side of the pond.'

b. Zhangsan bá yit-sengštzhongzài lù-bi
Zhangsan BA one-CL pine-tree plant-at road-side
'Zhangsan plants a pine tree on the side of the road.'

c. Xiátoud bá qiánšt chángštzhong
small-thief BA money-bag hide-at trees-middle
'The pickpocket hides the wallet amidst the trees.'

d. Chútong shijie rénmen bá xígšt fangzšt chuándšt-xi
begin-winter time-season people BA watermelon put-at bed-bottom-under
'In early winter, people store their watermelon under the bed.'

e. Xiátúštían gèn-men dóu bá xìzt tuóšt mént-wái
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. Béijíng 'Beijing', Wúlùmúqi 'Urumqi', and Zhongguó 'China'. In the
following examples, however, we can see that these proper names function just as if they are LPs.

    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. Bēijing-(fǐ)/Zhōngguó-(wàǐ)/Wùlūmùqi-(biān) yǒu xūduō wàiguórén.
    Beijing-inside/China-outside/Urumqi-side have many foreigner
    'There are a lot of foreigners in Beijing/China/Urumqi.'

(17) a. Zhāngsān bā chē tíngzài gōngyuán-(fǐ)/mén-*(wài)/lù-*(biān).
    Zhāngsan BA car park-at park-inside/door-outside/road-side
    'Zhāngsan parks his car inside the park/outside the door/on side of the road.'

    b. Zhāngsān bā chē tíngzài Bēijing-(fǐ)/Zhōngguó-(wàǐ)/Wùlūmùqi-(biān).
    Zhāngsan BA car park-at Beijing-inside/China-outside/Urumqi-side
    'Zhansan 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. 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 bēijīng-chéng 'the city of Beijing' and wùlūmùqi-shì 'the city of Urumqi'. Then we can affix the normal locative endings to the compounds such as bēijīng-chéng-ǐ 'inside Beijing (city)' and wùlūmùqi-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 -ǐ ‘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 shūbāo-ī, it is the ending -ī 'inside' that maps the NP shūbāo 'bookbag' into the space that is inside the bookbag. Likewise, for the phrase wūlùmūqi-shī-wāi, the ending -wāi 'outside' takes the NP wūlùmūqi-shī '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/*bēn qiáng
    that-CL/CL/CL wall
    'that wall'

b. nèi-zhāng/*miàn/*bēn zhuōzǐ
    that-CL/CL/CL table
    'that table'

c. nèi-bēn/*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.

    Zhangsan BA that-CL painting hang-at-PER wall-top/wall
    'Zhangsan has hung that painting on the wall.'
    b. Zhăngsăn bâ nêî-fu huà bâizài-le zhuô zi-shâng/#zhuôzi.
    Zhangsan BA that-CL painting place-at-PER table-top/table
    'Zhangsan has placed that painting on the table.'
    c. Zhăngsăn bâ nêî-fu huà fângzài-le shû-shâng/#shû.
    Zhangsan BA that-CL painting put-at-PER book-top/book
    'Zhangsan has put that painting on the book.'

(20) a. Zhăngsăn lêiqi-le yî-miân qiâng/#qiâng-shâng.
    Zhangsan build-up-PER one-CL wall/wall-top
    'Zhangsan has built up a wall.'
    b. Zhăngsăn miä-le xûduô zhuôzi/#zhuôzi-shâng.
    Zhangsan buy-PER many wall/wall-top
    'Zhangsan has bought many tables.'
    c. Zhăngsăn yîu hênduô shû/#shû-shâng.
    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. nêî-miân/#zhâng/#bêîn qiâng-shâng
    that-CL/CL/CL wall-top
    'on that wall'
    b. nêî-zhâng/#miân/#bêîn zhuôzi-shâng
    that-CL/CL/CL table-top
    'on that table'
    c. nêî-bêîn/#zhâng/#miân shû-shâng
    that-CL/CL/CL book
    'on that book'
The fact that the expressions in (21) are acceptable raises at least the following questions. If qiáng-shàng, zhuōzǐ-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', zhuōzǐ '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, zhuōzǐ-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, zhuōzǐ-shàng, and shū-shàng to be the same but different from those for qiáng 'wall', zhuōzǐ '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 qiángqiāo 'corner of the wall', the classifier is gè not miàn. For the word zhuōzǐ 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. něi-gè/*miàn/*zhāng/*běn qiángqiāo
    that-CL/CL/CL/CL wall-corner
    'that corner of the wall'

b. něi-tiáo/*zhāng/*miàn/*běn zhuōzǐtuǐ
    that-CL/CL/CL/CL table-leg
    'that leg of the table'

c. něi-zhāng/*běn/*miàn shūpí
    that-CL/CL/CL book-wraper
    '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

\[
\begin{align*}
& \text{PHON} (\text{shàng}) \\
& \text{SYNSEM|LOCAL|CAT} \quad \text{HEAD} \quad \text{locative} \\
& \quad \text{COMP} \quad 1 \\
& \quad \text{SUBCAT} \quad (\text{NP})
\end{align*}
\]

Then the structure of zhuōzi-shàng 'on the table' is as in (24)

(24) The structure of zhuōzi-shàng 'on the table'

\[
\begin{align*}
& \text{LP} [\text{zhuōzi-shàng}] \\
& \quad \text{NP} [\text{zhuōzi}] \quad \text{LOCATIVE} [\text{shàng}] \\
& \quad \text{COMP} \quad 1
\end{align*}
\]

5.3. The Analysis with LP

5.3.1. Postverbal Subcategorization
At the beginning 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 bā zi jì de dàyì guàzài-le yìjiā-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 yìjiā-shàng guàzài-le zi jì de dàyì.
   Zhangsan ZAI clothes-rack-top hang-at-PER self DE big-coat

In (5), as I have pointed out earlier, dàyì '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 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)

```
  verb
    /\ transitive
   /   intransitive
nominal locative
```

A locative verb, abbreviated as *verb-loc* in lexical entries, is defined to have the following subcategorization frame.

(28) Subcategorization frame for *verb-loc*

```
  HEAD *verb-loc*
  SUBJ (2)
  MCOMPS [3]
  OBJ (LP)
```

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 *yíjià-shàng*, the only LP on the SUBCAT list, as its object, and substituting with an NP results in the unacceptability of the sentence, as is shown in (5b). Please note that changing the LP *yíjià-shàng* 'on the clothes rack' to the NP *yíjià* 'clothes rack' also results in ungrammaticality, as is shown in (29).

(29) *Zhāngsān bā zǐ ji de dàyī guàzài-le yíjià.*
    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) Dàyí guà-zài-le yǐjià-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 guà-zài we have seen here. They are different also because they show different subcategorization frames. While the compound verb guà-zài 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

<table>
<thead>
<tr>
<th>HEAD verb-nom</th>
</tr>
</thead>
<tbody>
<tr>
<td>SUBJ (2)</td>
</tr>
<tr>
<td>MCOMP (3)</td>
</tr>
<tr>
<td>OBJ (NP)</td>
</tr>
</tbody>
</table>

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.

Zhangsan ZAI clothes-rack-top hang-PER one-CL big-coat
'Zhangsan has hung an overcoat on the clothes rack.'

Zhangsan BA one-CL big-coat hang-PER clothes-rack-top

c. Zhāngsān guà-le yǐ-jìān dāyí.
Zhangsan hang-PER one-CL big-coat
'Zhangsan has hung an overcoat.'

d. Yǐjià-shàng guà-le yǐ-jìān dāyí.
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 kuāizǐ '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 zāi. This is shown in the following examples.

(33) a. Zhāngsān zāi xuéxiào(-fū)/shāngdiàn(-fū) gōngzuò.
    Zhangsan ZAI school-inside/store-inside work
    'Zhangsan works for/inside the school/the store.'

b. Zhāngsān kěyì zāi 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 yīnggái zāi shìtáng chī fān.
    Zhangsan must ZAI dining-hall eat meal
    'Zhangsan must subscribe his meal with the dining hall.'

    Zhangsan must ZAI dining-hall-inside eat meal
    'Zhangsan must eat his meal inside the dining hall.'

c. Zhāngsān yīnggái chī shìtáng.
    Zhangsan must eat dining-hall
    'Zhangsan must subscribe (his meal) with the dining hall.'

d. *Zhāngsān yīnggái chī shìtáng-fū.
    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, fān 'meal' is the most patient-like and it takes the object position. However, when fān '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 shìtáng 'the dining hall' and shìtáng-fū '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 shìtáng can fulfill the requirement. Hence the unacceptability of (34b) when shìtáng-fū 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 beginning 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.

that-CL table-top fewer-PER three-CL leg  
There are three fewer legs on that table.'

   b. Nêi-zhâng zuòzi shào-le sān-tiāo tūi.  
that-CL table fewer-PER three-CL leg  
'That table has three fewer legs.'

(36) a. Xüeshēng shìtāng-fā lái-le yì-wèi xīn jīnglǐ.  
student dining-hall-inside come-PER one-CL new manager  
'There is a new manager inside the student dining hall.'

   b. Xüeshēng shìtāng lái-le yì-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. Zhângsān shuāiduàn-le yī-tiāo tūi.  
Zhangsan throw-break-PER one-CL leg  
'Zhangsan has broken one of his legs (by falling down).'</n
   b. Zhângsān bâ nèi-zhâng zuòzi shuāiduàn-le yī-tiāo tūi.  
Zhangsan BA that-CL table throw-break-PER one-CL leg  
'Zhangsan has broken one of the table's legs (by letting it fall).'</n
If we assume the empty category pro within the NP yī-tiāo tūi ‘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 zhuōzǐ '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 tūi '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-command the object because it is embedded inside the LP. Thus the empty category pro is no longer bound by nèi-zhāng zhuōzǐ '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 yī-wèi xīn jǐn 'a new manager', the analysis is the same as in (35).

However, the above analysis is not a straightforward application of the HPSG binding principles proposed in P&G 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 hierarchy, 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][N]NP làn-le [sān-gè[ei][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 Zāngsàn de yītáiō 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. Zāngsàn, zài zhuōzi-shàng jù shuài/duàn-le pro_i/y jí-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-zhāng zhuōzi]NP_i-sàng]LP_j shāo-le [pro_i/y jí sān-tiáo tuǐ]NP
that-CL table-top fewer-PER three-CL leg
'There are three fewer legs on that table.'

b. [[Nèi-zhāng zhuōzi]NP_i shāo-le [pro_j sān-tiáo tuǐ]NP
that-CL table fewer-PER three-CL leg
'That table has three fewer legs.'

(36) c. [[Xuéshēng shitàng]NP_i-lái-le [pro_i/y jí-wèi xīn jǐnli]NP
student dining-hall-inside come-PER one-CL new manager
'There is a new manager inside the student dining hall.'

b. [[Xuéshēng shitàng]NP_i-lái-le [pro_i/y jí-wèi xīn jǐnli]NP
student dining-hall come-PER one-CL new manager
'The student dining hall now has a new manager.'

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 bā yī-fù huà bāizài-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. Zhàngsān chī-le yì-ge píngguǒ.
    Zhangsan eat-PER one-CL apple
    'Zhangsan ate an apple.'
   b. Zhàngsān bā yì-gē 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 analysis. 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 bā and non-bā 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 bā-phrase is analyzed as the fronted object. That is, the object is base-generated in a postverbal object position and then fronted together with bā. 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 bā, 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 bā-phrase alternation. Problems, however, remain as why there are cases where bā-phrase alternations are found without the source non-bā sentences and vice versa.

The approaches that treat bā 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 bā 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 bā 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 bā-phrase structure and bèi-phrase structure in Chines. Since the bèi-phrase structure is generally recognized as the passive voice and the bā-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 zāi-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 bā 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 bā-phrase does not have the alternate VO structure and there are other cases where a VO structure does not have bā-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 approaches 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 bā-phrase should be treated as the object of the verb. His arguments include the observation that there is a regular relation between the bā-phrase and the bèi-phrase. Examine the following.

(6)  

a. Zhāngsān bā Lísì dāshāng-le.  
Zhāngsān BA Lísì hit-wound-PER  
'Zhangsan has wounded Lisi.'

b. Lísì bèi Zhāngsān dāshāng-le.  
Lísì BEI Zhāngsān hit-wound-PER  
'Lisi has been wounded by Zhangsan.'

c. Zhāngsān dāshāng-le Lísì.  
Zhāngsān hit-wound-PER Lísì  
'Zhangsan has wounded Lisi.'

(7)  

a. Wángwū bā qíché mài-le.  
Wángwū BA car sell-PER  
'Wangwu has sold the car.'

b. Qíché bèi Wángwū mài-le.  
car BEI Wangwu sell-PER  
'The car has been sold by Wangwu.'

c. Wángwū mài-le qíché.  
Wángwū 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 bā-phrases in the (a) examples. Therefore it seems reasonable that the bā-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 bā-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. Lísì zài hēibān-shāng xiěmán-le zì.  
Lísì ZAI blackboard-on write-full-PER word  
'Lisi has written all over the blackboard.'
b. Héibān-shāng bèi Líṣī xiēmān-le zǐ.
   bāi blackboard-on by Lisi write-full-PER word
   'Lisi has written all over the blackboard.'

c. *Líṣī bā zǐ xiēmān-le héibān-shāng.
   Líṣī BA word write-full-PER blackboard-on

   (9) a. Líṣī gěi Wángwǔ wāng jiā-ľí jī-ľē yī-mei zàdān.
      Líṣī GEI Wangwu WANG home-inside mail-PER one-CL bomb
      'Lisi mailed a bomb to Wangwu at his home.'

   b. Wángwǔ bèi Líṣī wāng jiā-ľí jī-ľē yī-mei zàdān.
      Wangwu BEI Lisi WANG home-inside mail-PER one-CL bomb
      'Wangwu was mailed a bomb by Lisi to his home.'

      Líṣī BA one-CL bomb towards home-inside mail-PER Wangwu

      home-inside BEI Lisi GEI Wangwu mail-PER one-CL bomb
      'Lisi mailed a bomb to Wangwu at his home.'

   e. *Líṣī bā yī-mei zàdān gěi Wángwǔ jī-ľē jiā-ľí.
      Líṣī BA one-CL bomb GEI Wangwu mail-PER home-inside

10) a. Líṣī cóng wǒmen xuéxiāo tōuzōu-le xūduō dòngxi.
    Líṣī CONG our school steal-go-PER many thing
    'Lisi has stolen a lot things from our school.'

   b. Wǒmen xuéxiāo bèi Líṣī tōuzōu-le xūduō dòngxi.
      our school by Lisi steal-go-PER many thing
      'Lisi has stolen a lot things from (the) school.'

   c. *Líṣī bā xūduō dòngxi tōuzōu-le wǒmen xuéxiāo.
      Líṣī BA many thing steal-go-PER our school

Thus, according to this analysis, the preverbal phrases with zài in (8), gěi and wāng 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 bā-phrases have the option of appearing postverbally, while others cannot. This is shown in the above (c) and (e) sentences. This seems to suggest that the bā-phrases are treated as the object, not because they can be passivized, but because there is a relation between the bā-phrases and the postverbal non-bā-phrases. This pattern is recognized by Travis (1984), where she suggests that the postverbal objects should be treated as derived from the preverbal bā-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 bā and non-bā alternation. But these sentences cannot be passivized. Examine the following.

---

1 As has been shown previously, not all bā-phrases can appear postverbally. Some preverbal non-bā-phrase may appear postverbally provided that they are the most patient-like arguments with certain transitive verbs.
(11) a. Wōmén yào xuéxi Léi Féng.
   we must learn Lei Feng
   'We must learn from Lei Feng.'

   b. Wōmén yào xiàng/＊bā Léi Féng xuéxi.
   we must XIANG/BA Lei Feng learn
   'We must learn from Lei Feng.'

   c. *Léi Féng yào bèi wōmén xuéxi.
   Lei Feng must by we learn

(12) a. Lìsī qù-le Méiguó.
   Lisi go-PER USA
   'Lisi has gone to the United States.'

   b. Lìsī dào/＊bā Méiguó qù-le.
   Lisi DAO/BA USA go-PER
   'Lisi has gone to the United States.'

   c. *Méiguó bèi Lìsī 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 bā 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 bā 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 bā-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 bāimān '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 bā zhūōzi(-shāng) bāimān-le shū.
    Zhangsan BA table(-top) place-full-PER book
    'Zhangsan has put books all over the table.'
b. Zhāngsān bā shū bāimān-le zhuōzì(*-shàng).
   Zhangsan BA book place-full-PER table(-top)
   'Zhangsan has put books all over the table.'

(14) a. Zhāngsān tiāntiān zài fànguǎn(-ī) chī fàn.
   Zhangsan day-day ZAI restaurant(-inside) eat meal
   'Zhangsan eats his meal in restaurants everyday.'

b. Zhāngsān tiāntiān chī fànguǎn(*-ī).
   Zhangsan day-day eat restaurant(*-inside)
   'Zhangsan eats his meal in restaurants everyday.'

(15) Zhāngsān bā shū fàngzài-le zhuōzì-* (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 Līsī de cù.
    Zhangsan eat-PER Lisi DE vinegar
    a. 'Zhangsan was jealous of Lisi.'
    b. 'Zhangsan has consumed Lisi's vinegar.'

c. Zhāngsān bā Līsī de cù chī-le.
   Zhangsan BA Lisi DE vinagar eat-PER
   'Zhangsan has consumed Lisi's vinegar.'

    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 bā yī-píng jiāngyóu dā-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 dā '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 qìèi-le mā.
Zhansan 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 bā mā qìèi-le
Zhansan 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 mā can have both readings because there are generally no semantic restrictions imposed on objects. Thus when mā is interpreted as generic, we understand that it is Zhangsan who is tired, not horses in general. If, on the other hand, mā 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 bā. As is argued in Liu (1993), bā-marked NPs are required to be specific and therefore the preverbal mā 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 něi-pī '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 qìèi-le něi-pī mā.
Zhansan ride-tired-PER that-CL horse
'Zhangsan rode on that horse and got it tired.'

b. Zhāngsān bā něi-pī mā qìèi-le
Zhansan 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) Mā shì yǒuyòng de dòngwù.
horse is have-use DE animal
'Horses are useful animals.'
(20) the category of a transitive verb in Chinese
\[
\begin{align*}
&\text{HEAD } \text{verb-tr} \\
&\text{SUBJ } \langle 1 \rangle \\
&\text{MCOMPS } \langle [2; \ldots; (n-1) \rangle \\
&\text{OBJ } \langle n \rangle \\
&\text{SUBCAT } \langle [\text{ARG}_1, \ldots, \text{ARG}_n] \rangle
\end{align*}
\]
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
The following are instantiations of the lexical entry in (21).

(22) a. Lìsì kèyì yòng zhàoxiàngjī zài tiānshān-(shāng) zhào zhàopian.
    Lisi can YONG camera ZAI sky-mountain-(top) take photograph
    'Lisi can take pictures with a camera on Tianshan mountains.'

    b. *Lìsì kèyì yòng zhàoxiàngjī zài tiānshān-(shāng) bā 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 bā 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. Lìsì kèyì zài tiānshān-(shāng) 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-shāng kèyì 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. Zhàoxiàngjì kěyí 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. Lǐsī kěyí zài tiānshān-(shàng) zhào zhàopian.
Lisi can ZAI sky-mountain-(top) take photograph
'Lisi can take pictures on Tianshan mountains.'

c. Lǐsī kěyí yòng zhàoxiàngjì zhào zhàopian.
Lisi can YONG camera take photograph
'Lisi can take pictures with a camera.'

d. Lǐsī kěyí yòng zhàoxiàngjì zhào tiānshān(*-shàng).
Lisi can YONG camera take sky-mountain(*-top)
'Lisi can take pictures of the Tianshan mountains with a camera.'

e. *Lǐsī kěyí yòng zhàoxiàngjì 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 zhàoxiàngjì '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. Zhàoxiàngjì kěyí zhào zhàopian.
camera can take photograph
'A camera can (be used to) take pictures.'

b. Zhàoxiàngjì kěyí zhào tiānshān(*-shàng).
camera can take sky-mountain(*-top)
'A camera can (be used to) take (pictures of) Tianshan mountains.'

c. Lǐsī kěyí zhào zhàoxiàngjì.
Lisi can take camera
'Lisi can take pictures with a camera.'

d. Lǐsī kěyí zhào tiānshān(*-shàng)
Lisi can take sky-mountain(*-top)
'Lisi can take pictures of the Tianshan mountains.'

e. Lǐsī kěyí zhào zhàopian.
Lisi can take photograph
'Lisi can take pictures.'

f. Tiānshān-(shàng) kěyí zhào zhàopian.
sky-mountain-(top) can take photograph
'Pictures can be taken on Tianshan mountains.'
g. *Lísi kēyì yòng zhàoxìàngjí zhào.
   Lisi can YONG camera take
h. *Lísi kēyì zài tiānshān-(shàng) zhào.
   Lisi can ZAI sky-mountain-(top) take
i. *Zhàoxìàngjí kēyì 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 result in unacceptability 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. Lísi kēyì yòng dingzi bā huà guàzài qiáng-shàng.
   Lisi can YONG nail BA painting hung-at wall-top
   'Lisi can hang the painting on the wall with nails.'

   Lisi can YONG nail ZAI wall-top hung-at painting
c. *Lǐshì kěyì yòng dīngzǐ zài qiáng-shàng bā huà guàzài.
   Lǐshì 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. Dīngzǐ kěyì bā huà guàzài qiáng-shàng.
       nail can BA painting hung-at wall-top
       'Nails can (be used to) hung the painting on the wall.'

   b. Lǐshì kěyì bā huà guàzài qiáng-shàng.
       Lǐshì can BA painting hung-at wall-top
       'Lǐshì can hung the painting on the wall.'

   c. *Dīngzǐ kěyì zài qiáng-shàng guàzài huà.
       nail can ZAI wall-top hung-at painting

   d. *Lǐshì kěyì zài qiáng-shàng guàzài huà.
       Lǐshì can ZAI wall-top hung-at painting

   (28) a. Huà kěyì guàzài qiáng-shàng.
       painting can hung-at wall-top
       'The painting can be hung on the wall.'

   b. *Qiáng-shàng kěyì guàzài huà.
       wall-top can hung-at painting

   c. *Huà kěyì zài qiáng-shàng guàzài.
       painting can ZAI wall-top hung-at

   d. *Qiáng-shàng kěyì bā 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

   HEAD  verb-intr
   SUBJ  ⟨1⟩
   MCOMP  ⟨2,...,n⟩
   OBJ  ⟨⟩
   SUBCAT  ⟨1ARG₁, ..., nARGₙ⟩
Where \( n \geq 1 \) and \( \text{MCOMPS} = \langle \rangle \) if \( n = 1 \)

As we can see from the entry in (29), the major difference here is that the OBJ value of an intransitive 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

\[
\begin{align*}
\text{PHON} (\text{xuéxi}) & \quad \text{HEAD verb-intr} \\
\text{SYNSEM} | \text{LOCAL} | \text{CAT} & \quad \text{SUBJ} (1) \\
& \quad \text{MCOMP} (2,3) \\
& \quad \text{OBJ} () \\
& \quad \text{SUBCAT} (1\text{NP}, 2\text{NP} / \text{LP}, 3\text{NP})
\end{align*}
\]

An instantiation of (30) is shown as (31) below.

(31) Zhàngsan zài gōngchǎng (-ǐ) xiàng gōngrén xuéxi.  
Zhangsan ZA1 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. Lìsī xué xi wén jì àn.
   Lìsī study document
   'Lìsī studies the documents.'
b. Lìsī xué xi.
   Lìsī study
   'Lìsī studies.'
c. *Wén jì àn xué xi.
   document study

Thus unergativity entails the obligatoriness of the most agent-like argument, which must serve as the subject of the sentence. Therefore xué xi in (34b) is not just an intransitive verb but an unergative intransitive verb. A typical structure of an unergative intransitive verb is shown in (35).

(35) the category of an unergative intransitive verb with one or two arguments

```
CAT
  HEAD verb- unerg
  SUBJ ⟨1⟩
  MCOMP ⟨2⟩
  SUBCAT ⟨1NP ⟨2NP / LP⟩⟩
  CONT relation
    V-ER 4
    V-RELATED 5
```

The following are some instantiations of (35).

(36) a. Lìsī zài fáng àn(-ǐ) chìbào-le.
   Lìsī ZAI restaurant(-inside) eat-full-PER
   'Lìsī is full after eating in a restaurant.'
b. Lìsī chìbào-le.
   Lìsī eat-full-PER
   'Lìsī is full after eating.'
c. *Fáng àn(-ǐ) chìbào-le.
   restaurant(-inside) eat-full-PER

(37) a. Wǒ xiàng Léi Fèng xué xi.
   we XIANG Lei Feng learn
   'We learn from Lei Feng.'
b. Wǒ xué xi.
   we learn
   'We learn.'
c. *Léi Fèng xué xi.
   Lei Feng learn
   Intended: '(Someone) learns from Lei Feng.'
(38) a. Zhāngsān dào Méiguó 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. *Méiguó lái-le.
    US come-PER

Some unergative verbs may have transitive counterparts. The transitivity 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 bā. An intransitive verb that takes an bā complement can be classified as a middle verb, as explained below. Examine the following.

(39) a. Zhāngsān bā tǔ shuāiduàn-le.
    Zhangsan BA leg fall-break-PER
    'Zhangsan broke his leg after falling down.'

b. Tǔ 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 tǔ.
    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 assign. 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 subject. In Chinese, there are verbs that also display the same ergative properties.

(41) a. Qiánbāo diū-le.
    money-bag lost-PER
    'The wallet has disappeared.'
    Cf. b. Zhāngsān diū-le qiánbāo
    Zhangsan lost-PER money-bag
    'Zhangsan has lost (his) wallet.'
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, bā-marked complements have been argued to have all the properties an internal argument must have. For instance, Travis (1984) has argued that the preverbal bā-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 bā-phrase to be an object and hence the internal argument.

Under the current analysis, the bā-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. 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 bā qián zhuāngzài kǒudāi-fī.
    Zhangsan BA money put-in-at pocket-inside
    'Zhangsan puts the money in the pocket.'

(ii) Qián zhuāngzài kǒudāi-fī.
    money put-in-at pocket-inside
    '(Someone) puts the money in the pocket.'

(iii) *Zhāngsān zhuāngzài kǒudāi-fī.
    Zhangsan put-in-at pocket-inside
    Intended: 'Zhangsan put (something) in pocket.'
position that *bā*-construction can be considered to pattern as an ergative structure.⁶ This is illustrated with the following examples.

(42) a. Fànrén fàngpāo-le.
criminal let-go-run-PER
'The criminal was let run away.'

b. Kànshōu fàngpāo-le fànrén.
jaider let-go-run-PER criminal
'The jailer has let the criminal run away.'

c. Kànshōu bā fànrén fàngpāo-le.
jaider BA criminal let-go-run-PER
'The jailer has let the criminal run away.'

d. *Kànshōu fàngpāo-le.
jaider run-PER
Intended: 'The jailer has let (someone) run away on.'

In (42a), the verb fàngpāo-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 kànshōu 'the jailer' is added to the SUBCAT list. (42c) is just like (42b) except that the verb fàngpāo-le is still intransitive. Thus the agent argument kànshōu 'the jailer' takes the subject position and the internal argument fànrén 'the criminal' becomes the *bā*-marked complement. Therefore, we see that the verb fàngpāo-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. Lào pó sī-le.
wife die-PER
'The wife has died.'

---

⁶ Robert Levine (personal communication) comments that *bā*-construction is like an antipassive. However, it is also different from an antipassive structure in that it can still undergo (standard) passivization.
In (43a), the verb sì '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 sì.

(43) c.
It is the properties of transitivizability and addibility of a more agent-like argument that the bā-structure shares with the ergative structure. However, the bā-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 bā-construction, the operation is divided into two separate steps: addition of an agent argument and transitivization of the verb. Examine the following.

(44) a. 仼ちわん-.le.
meal eat-finish-PER
The meal is finished.

b. 仼men bā 仼an ちわん- lle.
yey BA meal eat-finish-PER
'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 ba-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 bà-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 chiwán-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.

7 Carl Pollard observes that middle verbs without a bà-phrase, but not ergative verbs, can be thought of as passives without morphological change. Compare (43a) and (44a) with the following:

(i) Fàn bèi-chiwán-le.
    meal BEI-eat-finish-PER
    'The meal is finished (by someone).'

(ii) *Láopo bèi-sí-le.
    wife BEI-die-PER

However, in some cases, the bà-less middles are actually ambiguous, and only one of the readings has the same interpretation as the passive. Consider the following.

(iii) Zhángsān dāshāng-le.
    Zhangsan hit-wounded-PER
    a. 'Zhangsan got himself wounded while hitting someone.'
    b. 'Zhangsan was hit and wounded.'

(iv) Zhángsān bèi-dāshāng-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

\[
\begin{align*}
\text{CAT[HEAD} & \text{ verb-mid} \\
\text{SUBCAT (2NP[8]3NP[8])} \\
\text{relation} \\
\text{ROLE} & \text{4} \\
\text{ROLE} & \text{5} \\
\downarrow & \\
\text{CAT [SUBCAT (3NP[8])]} \end{align*}
\]

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 bā júzǐ fāngzǎi-le lánzǐ-ji.
    Zhangsan BA orange put-at-PER basket-inside
    'Zhangsan has put the oranges in the basket.'

    b. Júzǐ fāngzǎi-le lánzǐ-ji.
        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 intransitive 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. Líshì kāizǒu-le nèi-bu qīchē
    Lisi drive-away-PER that-CL car
    'Lisi has driven the car away.'
b. the lexical entry for the transitive verb kāizōu-le

```
PHON ⟨kāizōule⟩
  CAT
  SUBCAT ⟨NP[Lisî], NP[nēi-bu qîchê⟩
  SYNSEM|LOCAL
    causation
    AFFECTED away AWAY [2]
```

The lexical entry of kāizōu-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 kāizōule. But the verb is now used intransitively and does not take any object. The two arguments are arranged as the subject and bā-marked complement and the sentence is projected from an intransitive verb given as (46d).

(46) c. Lisî bā nēi-bu qîchê kāizōu-le
    Lisî BA that-CL car drive-away-PER
    'Lisi has driven the car away.'

d. the lexical entry for the intransitive verb kāizōu-le

```
PHON ⟨kāizōule⟩
  CAT
  SUBCAT ⟨NP[Lisî], NP[nēi-bu qîchê⟩
  SYNSEM|LOCAL
    causation
    AFFECTED away AWAY [2]
```

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.

165
(46) e. Transitivity Rule for Intransitive Middle Verbs

\[
\text{CAT} \left[ \text{HEAD verb-mid-intr} \right] \\
\text{SUBCAT} (\text{NP}_1, \text{NP}_2) \\
\text{RELATION} \\
\text{ROLE} [1] \\
\text{ROLE} [2] \\
\downarrow \\
\text{CAT} \left[ \text{HEAD verb-tr} \right] \\
\text{SUBCAT} (\text{NP}_1, \text{NP}_2) \\
\text{RELATION} \\
\text{ROLE} [1]
\]

An ergative verb is also an intransitive verb. It can be transitivized by adding an agent-like argument to the SUBCAT list. This is shown in the following.

(47) a. Yi-ge ren lai-le.
    one-CL person come-PER
    'A person has come.'

   b. Ji-a-zi lai-le yi-ge ren
    home-inside come-PER one-CL person
    'To (our) home has come a person.'

c. the transitivization lexical rule for ergative verbs

\[
\text{CAT} \left[ \text{HEAD verb-erg} \right] \\
\text{SUBCAT} (\text{NP}_1) \\
\text{RELATION} \\
\text{ROLE} [1] \\
\downarrow \\
\text{CAT} \left[ \text{HEAD verb-tr} \right] \\
\text{SUBCAT} (\text{NP}/\text{LP}_1, \text{NP}_2) \\
\text{EXPERIENCE} \\
\text{EXPERIENCED} \left[ \text{RELATION} \right] \\
\text{ROLE} [1]
\]

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 transitivization lexical rule for unergative verbs

166
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 Bēijing.
Zhangsan go-PER Beijing
'Zhangsan has gone to Beijing.'

b. Zhāngsān dào Bēijing 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. *Bēijing qù-le.
Bēijing go-PER
Intended: '(Someone) has gone to Beijing.'
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 *chí-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 bā-phrase can always alternate with the transitive use of the verb. However, other verbs do not allow the bā-phrase alternation. Some verbs even do not allow any alternation at all. Here are some examples.

(51) a. Zhāngsān hēzū-le jiū.
    Zhāngsān drink-drunk-PER wine
    'Zhāngsān is drunk (after drinking wine).'

   b. *Zhāngsān bā jiū hēzū-le.
    Zhāngsān BA wine drink-drunk-PER

(52) a. Zhāngsān bā yīzi shuāiguān-le tūi.
    Zhāngsān BA chair throw-break-PER leg
    'Zhāngsān has broken the chair's legs (after throwing it).'

   b. *Zhāngsān bā yīzi bā tūi shuāiguān-le.
    Zhāngsān BA chair BA leg throw-break-PER

(53) a. Zhāngsān bā xīngli fāngzài-le chē-shàng.
    Zhāngsān BA luggage place-at-PER bus-top
    'Zhāngsān has put the luggage on the bus.'

    Zhāngsān 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 bā-phrase alternation is largely dependent on how the arguments of each verb can be matched. Take the following as examples.

169
(54) a. Zhāngsān hēzū-le jū.
   Zhāngsān drink-drunk-PER wine
   'Zhāngsān got drunk after drinking wine.'

   b. *Zhāngsān bā jū hēzū-le.
      Zhāngsān BA wine drink-drunk-PER

(55) a. Zhāngsān hēguāng-le jū.
   Zhāngsān drink-empty-PER wine
   'Zhāngsān has drunk all the wine.'

   b. Zhāngsān bā jū hēguāng-le.
      Zhāngsān BA wine drink-empty-PER
      'Zhāngsān has drunk all the wine (the wine pot is empty)._'

It has been argued by Hashimoto in his analysis that only when the object of the
matrix verb matches the subject of the embedded verb is the bā-phrase alternation possible.
In (54) the object of the matrix verb hē 'drink' is jū 'wine', but the subject of the
embedded verb zūi 'get drunk' is Zhāngsān. There is no match, hence the unacceptable bā-
construction. In (55), we have the same matrix verb, but a different embedded verb guāng
'be empty', the subject of which is jū 'wine', a match for the object of the matrix verb.
Therefore, we have an acceptable bā-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 shōupa.
   Zhāngsān cry-wet-PER handkerchief
   'Zhāngsān cried (so much) that the handkerchief got wet.'

   b. Zhāngsān bā shōupa kūshī-le.
      Zhāngsān BA handkerchief cry-wet-PER
      Zhāngsān cried (so much) that the handkerchief got wet.

(57) a. Zhāngsān (chí fān) chīhuāi-le dùzi.
   Zhāngsān eat meal eat-bad-PER stomach
   'Zhāngsān's stomach is upset (after eating the meal)._'

   b. Zhāngsān (chí fān) bā dùzi chīhuāi-le.
      Zhāngsān eat meal BA stomach eat-bad-PER
      'Zhāngsān'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 bā-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 explain the difference between héguāng 'drink to empty' in (55) and hézuǐ 'drink to be drunk' in (54), she proposes that in the stems of héguāng 'drink to empty', the two themes are co-indexed hence licensing the bā-construction. On the other hand, hézuǐ 'drink to be drunk' does not have coindexed themes so the bā-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 bā-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 bā-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 bā-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 bā-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 bā-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 bā-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 chīwān-le fān,
    they eat-finished-PER meal
    'They have finished eating their meal.'

b. Tāmen bā fān chīwān-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 wān '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.

    they BA meal eat-finished-PER we go restaurant PARTICLE
    'They have finished all the food. Let's go to a restaurant.'

   d. #Tāmen chīwān-le fān. Zānmēn qù fānguān 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 bā-construction and the non-bā-construction carry different information.

(59) a. Tā bā 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. Lìsì zhēn cūxin. Tā bā érzi diū-le.
    Lìsì really careless he BA son lose-PER
    'Lìsì is really careless. He has lost his son.'

d. Lìsì zhēn cūxin. #Tā diū-le érzi.
    Lìsì really careless he lose-PER son

Although both (59a) and (59b) are well-formed expressions, the inappropriateness of (59b) in the situation where Lìsì's careless is suggested to be the reason he has lost his son indicates that they carry different (aspects of the) information: while Lìsì is blamed on losing his son in (59a), the speaker's intention is not clear in (59b) whether Lìsì 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 Lìsì 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 hé '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 may 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 nēguāng '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 bā 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. Jiù héguāng-le.
    wine drink-empty-PER
    'The wine is has been drunk up.'

d. *Zhāngsān héguāng-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 *zhuí* '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 *zhuílèi* '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 *zhuílèi* for example. It is made of two stems, *zhuí* '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 zhūlèi-le  Lìsì.
   Zhāngsān chase-tired-PER Lìsì
b. 'Zhāngsān chased Lìsì and got himself (=Zhāngsān) tired.'
c. 'Zhāngsān chased Lìsì and got him (=Lìsì) tired.'
d. 'Chasing Zhāngsān made Lìsì tired.'
e. 'Zhāngsān chased (someone) and got Lìsì tired.'
f. Zhāngsān bā Lìsì zhūlèi-le.
   Zhāngsān BA Lìsì chase-tired-PER
g. 'Zhāngsān chased Lìsì and got him tired.'
h. 'Chasing Zhāngsān made Lìsì tired.'
i. 'Zhāngsān chased (someone) and got Lìsì tired'
j. Zhāngsān zhūlèi-le.
   Zhāngsān chase-tired-PER
k. 'Zhāngsān was tired after being chased.'
l. 'Zhāngsān 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 bā-construction in (60f), all the readings indicate that Lìsì, 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 zhūlè is Zhāngsān and theme of lèi is also Zhāngsān. 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. The RVC is illustrated in the following with the two component verbs jà 'cry' and stå 'be awake' in (61) and è 'be hungry' and ǹn 'faint' in (62).

(61)  
Lisi kuxing-le.  
Lisi cry-awake-PER  
' Lisi cried himself awake.'

(62)  
Zhângsân ëhûn-le.  
Zhângsan hungry -PER  
' Zhângsan 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 leftheaded 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 bà-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 bà-construction and the RVC is a middle transitivity rule will give us the (b) sentences and suppressing the agent argument gives us the (c) sentences.

(63) a. Lisi bà wo xiàoshâ-le.  
Lisi BA I laugh-confused-PER  
' Lisi's laugh confused me.'

b. Lisi xiàoshâ-le wo.  
Lisi laugh-confused-PER I  
' Lisi's laugh confused me.'

c. Wo xiàoshâ-le.  
I laugh-confused-PER  
' I was confused with (someone's) laugh.'

(64) a. Lisi bà tà kuxing-le.  
Lisi BA he cry-awake-PER  
' Lisi cried him awake.'

b. Lisi kuxing-le tà.  
Lisi cry-awake-PER he  
' Lisi cried him awake.'

c. Tà kuxing-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 bà-marked complement, hence making (64a) spuriously ambiguous. However, close connection between marked complement and the SOV word order suggests that bà-phrase should only be linked to right-headed RVCs. Therefore no consideration is given to the alternative suggestion that left-headed RVCs may produce bà-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 chībāo-le fàn
       Zhangsan eat-full-PER meal
       'Zhangsan ate the meal and was full.'

(66)  Lǐ sì xiūhāo-le qīchē.
       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.  Néi-wān fān bā Zhāngsān chībāo-le.
       that-CL meal BA Zhangsan eat-full-PER
       'The bowl of rice made Zhangsan full after he ate it.'

       b.  Néi-wān fān chībāo-le Zhāngsān.
           that-CL meal eat-full-PER Zhangsan
           'The bowl of rice made Zhangsan full after he ate it.'

       c.  Zhāngsān chībāo-le.
           Zhangsan eat-full-PER
           'Zhangsan was full after he ate (something) .'

(68)  a.  Lǐsì bā qīchē xiūhāo-le.
       Lisi BA car repair-good-PER
       'Lisi has fixed the car.'

       b.  Lǐsì xiūhāo-le qīchē.
           Lisi repair-good-PER car
           'Lisi has fixed the car.'

       c.  Qīchē xiūhāo-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 bā-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 pútāo bā dùzǐ chīhuāi-le.
   Zhangsan eat grape BA stomach eat-bad-PER
   'Zhangsan ate grapes and his stomach was upset.'

   b. Zhāngsān chī pútāo chīhuāi-le dùzǐ.
   Zhangsan eat grape eat-bad-PER stomach
   'Zhangsan ate grapes and upset his stomach.'

   c. Dùzǐ chī pútāo chīhuāi-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 pútāo, Zhāngsān bā dùzǐ chīhuāi-le.
   eat grape Zhangsan BA stomach eat-bad-PER
   'Eating grapes, Zhangsan's stomach was upset.'

   b. Chī pútāo, Zhāngsān chīhuāi-le dùzǐ.
   eat grape Zhangsan eat-bad-PER stomach
   'Eating grapes, Zhangsan upset his stomach.'

   c. Chī pútāo, dùzǐ chīhuāi-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 bā dùzǐ chīhuāi-le.
   Zhangsan BA stomach eat-bad-PER
   'Zhangsan's stomach was upset after he ate something.'
d. Zhāngsàn chīhuái-le dùzi.
   Zhangsan eat-bad-PER stomach
   'Zhangsan ate something and upset his stomach.'

e. Dùzi chīhuái-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 \(<1,1'-2'>\) are hard to come by but \(<1'-1,2'>\) and \(<1',1,2'>\) RVCs are illustrated below.

(71) a. Zhāngsàn zǒu-jìn-le jiàoshì.
    Zhangsan walk-enter-PER classroom
    'Zhangsan has walked into the classroom.'

---

9 The following sentences possibly fit in this category.

(i) Yǒu diyuán cuòsòng-le yī-jiān bāoguǒ.
    postman wrong-deliver-PER one-CL parcel
    'The postman delivered a wrong parcel.'

(ii) Zhāngsàn shēngchí-le yī-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 shēngchí is a RVC.

(iii) Zhāngsàn xǐhuàn 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 sòngcúo as is shown in (iv) below.

(iv) Yǒu diyuán sòngcúo-le yī-jiān bāoguǒ.
    postman deliver-wrong-PER one-CL newspaper
    'The postman delivered a wrong parcel.'

179
6.2.2.5. \((1',2'),(1',2),(1,2')\) 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)  
\[
\text{Zhāngsān wèndōng-le nèi-ge wèntī.}
\]
\[
\text{Zhangsan ask-understand-PER that-CL question}
\]
\[
\text{Zhangsan understood the question by asking it.}
\]

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 bā-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 yì jiào bā 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 bā qīchè kājīn-le chēfáng.
Zhāngsān BA car drive-enter-PER garage
'Zhāngsān drove the car into the garage.'

b. Qīchè kājīn-le chēfáng.
car drive-enter-PER garage
'The car was driven into the garage.'

(78) a. Nèi-chāng qiū bā guānzhòng tīfū-le Guǎngdōng duì.
that-CL ball BA audience kick-convince-PER Guangdong team
'The Guangdong Soccer Team played the game (so well) that the spectators were won over.'

(79) a. Lìsī bā Liúèr chānghuī-le nèi-shǒu gē.
Lìsī BA Liúèr sing-know-PER that-CL song
'Lìsī sang the song (so much) that Liúèr could sing it.'

b. Liúèr chānghuī-le nèi-shǒu gē. (≠ <1-1', 2-2'> or <1'-1, 2'-2>)
Liúèr sing-know-PER that-CL song
'(Someone) sang the song (so much) that Liúèr 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-Je Compounds

We have discussed the formation of RVCs and it has so far appeared that the bā-phrase is generated only with a right-headed RVC. But examine the following.

(80) a. Zhāngsān bā láopo sì-le.
Zhāngsān BA wife die-LE/PER
'Zhāngsān's wife has died on him.'

(81) a. Tā bā jūzí 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 -je. However, I will show that -je in this case is not just a tense marker, it is a verb as well.

\(^{10}\) Although a repeated V1 can save a 4-argument RVC. Examine the following.

(i) Zhāngsān bā zháqíú bā Lìsī tīduàn-le yì-tiāo nǎi
Zhāngsān kick foot-ball BA Lìsī kick-break one-CL leg
'Zhāngsān broke Lìsī'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 xiūduo rén.
    home-inside come-PER many person
    'A lot of people have come to our home.'

    b. Jiā-lǐ méiyǒu lái(*-le) xiūduo 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 bā lǎopo sī(-le).
    Zhangsan not-PER BA wife die-LE
    'Zhangsan's wife has not died on him.'

(81) b. Tā méiyǒu bā júzi bō*(-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 shì jù zhèyàng liǎoji-le.
    this-CL matter just this-way close-conclude-PER
    'This matter is thus concluded and closed.'

(84) Zhèyàng yě hào, ràng wǒ liǎoquè-le yìjiàn xīnshī.
    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 bā lǎopo sī.
    Zhangsan BA wife die
    Intended: 'Zhangsan's wife dies on him.'

(81) c. *Tā bā júzi bō 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.
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)

```
  sign
     \_____
        word    phrase
           \_____
              simple-word  compound
```

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 value 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

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 protopatient 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 Identification 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

\[
\begin{align*}
\text{PHON } & \quad \text{PHON} \\
\text{HEAD verb} & \quad \text{HEAD verb} \\
\text{SUBCAT} & \quad \text{SUBCAT} \\
\text{CONT} & \quad \text{CONT} \\
\end{align*}
\]

\[
\begin{align*}
\text{PHON append} & \\
\text{HEAD verb} & \\
\text{SUBCAT append} & \\
\text{CONT} & \\
\end{align*}
\]

causation

CAUSE
AFFECTED

where \*5 < 6

\[11\]

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

\[
\begin{align*}
\langle & \text{PHON } 1 \rangle \\
\langle & \text{HEAD verb } \text{TYPE } 3 \rangle \\
\langle & \text{SUBCAT } 5 \rangle \\
\langle & \text{CONT } 7 \rangle \\
\downarrow & \\
\langle & \text{PHON } \text{apend}(1, 2) \rangle \\
\langle & \text{HEAD verb-mid } \text{TYPE } 4 \rangle \\
\langle & \text{SUBCAT apend}(5, 6) \rangle \\
\langle & \text{CONT } \text{causation} \rangle \\
\langle & \text{CAUSE } 7 \rangle \\
\langle & \text{AFFECTED } 8 \rangle \\
\end{align*}
\]

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

\[
\begin{align*}
\langle & \text{HEAD verb-tr } \rangle \\
\langle & \text{SUBCAT } [1\text{NP}, 2\text{NP}] \rangle \\
\downarrow & \\
\langle & \text{HEAD verb-intr } \rangle \\
\langle & \text{SUBCAT } [3\text{NP}] \rangle \\
\end{align*}
\]

b. When V2 is the head

\[
\begin{align*}
\langle & \text{HEAD verb-tr } \rangle \\
\langle & \text{SUBCAT } [1\text{NP}, 2\text{NP}] \rangle \\
\downarrow & \\
\langle & \text{HEAD verb-mid-intr } \rangle \\
\langle & \text{SUBCAT } [2\text{NP}, 1 = 3\text{NP}] \rangle \\
\end{align*}
\]

186
As we can see, (91a) produces a different SUBCAT list from (91b). The difference is illustrated in the following examples.

(92) a. Zhăngsàn zhûîlê-i-le Lîši.  
Zhangsan chase-tired-PER Lisi  
'Zhangsan chased Lisi and got himself (=Zhangsan) tired.'

b. Lîši bâ Zhăngsàn zhûîlê-i-le.  
Zhangsan BA Lisi chase-tired-PER  
'Chasing Lisi made Zhangsan tired.'

Both (92a) and (92b) come from compounding the same verbs zhûî 'chase' and lêî 'be tired'. However, in (92a) the argument of lêî is identified with the first argument of zhûî and therefore Zhăngsàn 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 zhûî that is identified with the argument of lêî, and therefore Zhăngsàn becomes the most patient-like
argument on the SUBCAT list of the compound. Since the RVC is a middle verb, Zhăngsăn becomes the bā-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 kūxīng '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 xīng '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 xīng 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 bā-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 xīng, 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, bā 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 xīng 'be awake'

a. Tā kūxīng-le.
   he  cry-aware-PER
   'He cried himself awake.'
b. Tā bā wǒ kūxìng-le.
He BA I cry-awake-PER
'He woke me up with his crying.'
c. Tā kūxíng-le   wō.
   he cry-awake-PER I
   'He woke me up with his crying.'

\[ 5 \]

\[ \text{PHON} (kūxíng) \]
\[ \text{CAT} \text{HEAD verb-tr} \]
\[ \text{SUBCAT} (\text{NP}_1, 2\text{NP}_2) \]
\[ \text{SYNSEM} | \text{LOCAL} \]
\[ \text{CAUSE} \text{causation} \]
\[ \text{CONT} \text{CAUSER} \text{cry} \]
\[ \text{CRYER} 3 \]
\[ \text{AFFECTED} \text{awake} \]
\[ \text{AWAKE} 4 \]

\[ \text{PHON} (kūxíng) \]
\[ \text{CAT} \text{HEAD verb-tr} \]
\[ \text{SUBCAT} (\text{NP}_1, 2\text{NP}_2) \]
\[ \text{SYNSEM} | \text{LOCAL} \]
\[ \text{CAUSE} \text{causation} \]
\[ \text{CONT} \text{CAUSER} \text{cry} \]
\[ \text{CRYER} 3 \]
\[ \text{AFFECTED} \text{awake} \]
\[ \text{AWAKE} 4 \]

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 hēzūi '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 cāngān jīng 'wipe clean' in (95a). Transitivitying 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 chǐhuāi 'eat to upset' in (96) and give comments on it.

(94) a. Nēi-ping jiǔ bā Zhāngsān hēzūi-le.
    that-CL wine BA Zhangsan drink-drunk-PER
    'Zhangsan drank the bottle of wine and it made him drunk.'

    \[\text{PHON } \langle \text{hē} \rangle\]
    \[\text{HEAD verb-tr}\]
    \[\text{SUBCAT}\]
    \[\text{CONT} [\text{drink} \text{DRINKER } 4 \text{ DRUNK } 5]\]

    \[\text{PHON } \langle \text{zūi} \rangle\]
    \[\text{HEAD verb-intr}\]
    \[\text{SUBJ} [\text{Zhāngsān } 6]\]
    \[\text{CONT} [\text{drunk} \text{DRUNKARD } 6]\]

    \[\text{↓}\]

    \[\text{PHON } \langle \text{hezhūi} \rangle\]
    \[\text{HEAD verb-mid-intr}\]
    \[\text{SUBJ} [\text{nēi-ping jiū } 1-6 = [\text{Zhāngsān } 6]\]
    \[\text{cause}\]
    \[\text{CONT} [\text{dcaus} \text{DRINKER } 4 \text{ DRUNK } 5]\]
    \[\text{AFFECTED} [\text{drunk} \text{DRUNKARD } 6]\]

b. Nēi-ping jiǔ hēzūi-le Zhāngsān.
    that-CL wine drink-drunk-PER Zhangsan
    'Zhangsan drank the bottle of wine and it made him drunk.'
Zhāngsān hēzūi-le.
Zhāngsān drank something and it made him drunk.'

(95) a. Zhāngsān bǎ yīzi cāgānjǐng-le.
Zhāngsān BA chair wipe-clean-PER
Zhāngsān has wiped the chair clean.'
b. Zhāngsān cāgānjīng-le ǐźí.
Zhangsan wipe-clean-PER chair
'Zhangsan has wiped the chair clean.'
c. Yizi cāgānjīng-le.
   chair wipe-clean-PER
   'The chair has been wiped clean.'

(96) a. Zhāngsān chī shuǐguǒ bā dūzi 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 identification, 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 bā-marked
complement and the most agent-like argument is selected as the subject. This leaves the less agent-like argument shuiguō '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 shuiguō '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 shuiguō 'eat fruit' can appear together before the subject in (97a) suggests that it is not a marked complement. I suggest that chī shuiguō 'eat fruit' functions as an absolute adverbial adjunct. Perhaps reducing the argument NP shuiguō '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 suppressible. As (98) suggests, the phrase chī shuiguō '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.  
Zhāngsan eat-upset-PER stomach  
'Zhāngsan ate something and his stomach was upset.'  

\[
\text{PHON} \{\text{chīhuài}\} \\
\text{HEAD} \text{verb-tr} \\
\text{SUBCAT} \{(1\text{NP}[\text{Zhāngsān}]_{13}[3\text{NP}[\text{dùzi}]_{16})\} \\
\text{causation} \text{eat} \\
\text{CAUSE} \text{EATER} [4] \\
\text{EATEN} [5] \\
\text{AFFECTED} \text{upset} \\
\text{UPSET} [6]
\]

c. Dùzi chīhuài-le.  
stomach eat-upset-PER  
'(Someone's) stomach was upset (after eating something).'

195
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 chânglèi '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 yàosì '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) Lìsī chânglèi-le nèi-shòu gè.
Lisi sing-tired-PER that-CL song
'Lisi sang the song and got tired.'
(100) Đã hũi lăng yàoší-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 represent the verb with *zòudào* 'walk to arrive at' as (101) below.\(^{12}\)

(101)  Tā zòudào-le qiáng-shàng.  
he walk-arrive-at-PER wall-top  
'He walked onto the wall.'

---

12 The analysis also rules out the following sentences.

(i)  a. *Tā bā qiáng-shàng zòudào-le.  
he BA wall-top walk-arrive-at-PER  

b. *Qiáng-shàng zòudào-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 tìào jīn 'jump into' in (102).

(102) a. Zhāngsān bǎ yàoshi tìào jīn-le hé-fī.
Zhāngsān BA key jump-enter-PER river-inside
'As Zhangsan jumped, (his) keys fell into the river.'
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 tiàojìng-le hé-fì.  
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 bā-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 xuéhū 'study so as to know' in (103) and the second possibility with dāpà 'hit to make afraid' in (104).
(103) Zhangsan study-know-PER that-CL Tang-Dynasty-poem
Zhangsan studied and learned the piece of Tang Dynasty poem.'

(104) 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 possibility is that only the first argument of V1 is identified with the first argument of the head component. The RVC is illustrated with  

\(dúcchéng\) read to become' in (105) below.

(105) a. Nèi-xiē shū tā tā dúchéng-le jǐnshǐyān.
that-CL book BA he read-become-PER near-see-eye
'Reading those books made him become a near-sighted person.'
b. Ta dūchéng-ie ūnshīyīn.
he read-become-PEF near-see-eye
'Reading something made him become a short-sighted person.'

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 cāngzài 'hide in' as (106).

that-CL person BA money hide-at rock-under
'That man hides the money under the rock.'
The fourth possibility is when the first argument of VI is identified with the second head argument. This is illustrated with tfoot 'kick to convince' in (107) below.
(107) a. Nèi-chánɡ qiú bǎ guánhónɡ tǐfú-le  Guǎnɡdōnɡ duǐ.
that-CL ball BA spectators kick-converted-PER Guangdong team
'The Guangdong Soccer Team played the game (so well) that the spectators were convinced (of their superiority).'

b. Guánhónɡ tǐfú-le  Guǎnɡdōnɡ duǐ.
spectators kick-converted-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 arendra 'ask so to make understand' in (108) below.

(108) a. Lisi bā Zhāngsān wèndōng-le nèi-ge wèntí.
Lisi BA Zhangsan ask-understand-PER that-CL question
'Lisi made Zhangsan understand the question by asking 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 bā-marked complement and the unmarked complement, can be explained under this analysis: the bā-construction is a middle construction that is generated with right-headed RVCs. The alternation between bā- and non-bā-constructions can be seen as that between an intransitive middle and its transitivized version. Only bā-phrases in
transitive middle verbs do not have (postverbal) non-\textit{bā} 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 \textit{zhui} 'chase' is transitive and has two arguments denoted as 1 and 2, and V2 \textit{leī} 'be tired' is intransitive and has only one argument denoted as 3.

Zhangsan chase-tired-PER Lisi

b. 'Zhangsan chased Lisi and got himself (=Zhangsan) tired.'

\[
\begin{align*}
\text{PHON } & \langle \text{zhūlē} \rangle \\
\text{HEAD } & \text{verb-tr} \\
\text{SUBCAT } & \langle \text{1NP[Zhăngsan]-3, 2NP[Lìsì]} \rangle
\end{align*}
\]

c. 'Zhangsan chased Lisi and got him (=Lisi) tired.'

\[
\begin{align*}
\text{PHON } & \langle \text{zhūlē} \rangle \\
\text{HEAD } & \text{verb-tr} \\
\text{SUBCAT } & \langle \text{1NP[Zhăngsan], 2NP[Lìsì]-3} \rangle
\end{align*}
\]

d. 'Chasing Zhangsan made Lisi tired.'

\[
\begin{align*}
\text{PHON } & \langle \text{zhūlē} \rangle \\
\text{HEAD } & \text{verb-tr} \\
\text{SUBCAT } & \langle \text{2NP[Zhăngsan], 1-3NP[Lìsì]} \rangle
\end{align*}
\]

e. 'Zhangsan chased (someone) and got Lisi tired.'

\[
\begin{align*}
\text{PHON } & \langle \text{zhūlē} \rangle \\
\text{HEAD } & \text{verb-tr} \\
\text{SUBCAT } & \langle \text{1NP[Zhăngsan], 3NP[Lìsì]} \rangle
\end{align*}
\]

f. \textit{Zhăngsan bā Lìsì zhūlē-li.}  
Zhangsan BA Lisi chase-tired-PER

g. 'Zhangsan chased Lisi and got him tired.'

\[
\begin{align*}
\text{PHON } & \langle \text{zhūlē} \rangle \\
\text{HEAD } & \text{verb-mid-intr} \\
\text{SUBCAT } & \langle \text{1NP[Zhăngsan], 2-3NP[Lìsì]} \rangle
\end{align*}
\]
h. 'Chasing Zhangsan made Lisi tired.'

\[
\text{PHON } \langle \text{zhu\l\l e} \rangle \\
\text{HEAD } \text{verb-mid-intr} \\
\text{SUBCAT } \langle \text{2NP}[\text{Z\l\l i\l\l s\l\l n}], \text{1-3NP}[\text{Lisi}] \rangle
\]

i. 'Zhangsan chased (someone) and got Lisi tired.'

\[
\text{PHON } \langle \text{zhu\l\l e} \rangle \\
\text{HEAD } \text{verb-mid-intr} \\
\text{SUBCAT } \langle \text{1NP}[\text{Z\l\l i\l\l s\l\l n}], \text{3NP}[\text{Lisi}] \rangle
\]

j. \text{Lisi } zhu\l\l e-li.
Lisi chase-tired-PER

k. 'Lisi was tired after being chased.'

\[
\text{PHON } \langle \text{zhu\l\l e} \rangle \\
\text{HEAD } \text{verb-mid-intr} \\
\text{SUBCAT } \langle \text{2-3NP}[\text{Lisi}] \rangle
\]

l. 'Lisi was tired after chasing someone.'

\[
\text{PHON } \langle \text{zhu\l\l e} \rangle \\
\text{HEAD } \text{verb-mid-intr} \\
\text{SUBCAT } \langle \text{1-3NP}[\text{Lisi}] \rangle
\]

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-handed 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 ba-phrase is produced. In the traditional analysis, however, this is not so clear, because any argument of V1 may or may not be a ba-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 ba-phrase. In the two-way analysis proposed in this thesis, we can see that ba-phrase is always the first argument of V2 in a right-headed RVC. For instance, the ba-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 ba-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-ba alternations. These are the transitive middle verbs shown earlier as (52)-(53).

6.3. Consequences
We have seen that ba-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 ba-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 ba-phrase alternation. This is because the first argument
of zuǐ '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 hēzuǐ-le jiǔ.  
Zhāngsan drink-drunk-PER wine  
'Zhāngsan is drunk (after drinking wine).'

b. *Zhāngsān bǎ jiǔ hēzuǐ-le.  
Zhāngsan 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 yǐzǐ shuāiduān-le tūi.  
Zhāngsan BA chair throw-break-PER leg  
'Zhāngsan has broken the chair's legs (after throwing it).'

b. *Zhāngsān bǎ yǐzǐ bǎ tūi shuāiduān-le.  
Zhāngsan BA chair BA leg throw-break-PER

(53) a. Zhāngsān bǎ xīnglí fāngzài-le chē-shāng.  
Zhāngsan BA luggage place-at-PER bus-top  
'Zhāngsan has put the luggage on the bus.'

b. *Zhāngsān bǎ xīnglí zài chē-shāng fāngzài-le.  
Zhāngsan 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)

\[
\text{PHON} \{\text{shuāiduān}\} \\
\text{CAT} \text{HEAD} \text{verb-mid-tr} \\
\text{SUBCAT} \{\text{1NP} \text{Zhangsān} [1], \text{2NP} = \text{3NP} \text{yǐzǐ} [2], \text{4NP} \text{tūi} [3]\} \\
\text{SYNSEM} \text{LOCAL} \{\text{causation}\} \\
\text{CONT} \text{CAUSE THROWER 5} \\
\text{THROWN 6} \\
\text{AFFECTED BREAKER 7} \\
\text{BROKEN 8} \\
\]

211
The unacceptability of the (b) sentences in the above examples has been attributed to violation of haplogy (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 unmarked 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 xīhuān chī shuǐguǒ.
Zhangsan like eat fruit
'Zhangsan likes to eat fruit.'

b. Zhāngsān xīhuān chī de shuǐguǒ hěn duō.
Zhangsan like eat DE fruit very many
'The fruit that Zhangsan likes to eat is of many kinds.'

(114) a. Gēlúnbù fāxiān-le xīn dālù.
Columbus discover-PER new big-land
'Columbus discovered the New World.'

b. Gēlúnbù fāxiān de xīn dālù 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 bā-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).

Zhangsan BA orange peel-PER skin
'Zhangsan has peeled the orange off its skin.'

Zhangsan BA orange peel-PER DE skin
Intended: 'the skin that Zhangsan peeled off the orange'

c. bā 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'
Zhāngsan BA pencil put-into-PER bookbag  
'Zhāngsan has put the pencil into the bookbag.'

b. *Zhāngsăn bà qiānbǐ fāngqīn-le de shūbāo.  
Zhāngsan BA pencil put-into-PER DE bookbag  
Intended: 'the bookbag into which Zhāngsan has put the pencil'

c. bà qiānbǐ fāngqīn-le shūbāo de Zhāngsăn  
BA pencil put-into-PER bookbag DE Zhāngsan  
'Zhāngsan, who has put the pencil into the bookbag.'

d. Zhāngsăn fāngqīn-le shūbāo de qiānbǐ  
Zhāngsan put-into-PER bookbag DE pencil  
'the pencil that Zhāngsan 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 bà-marked complements. I have shown that the bà-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. Zhāngsăn bà yīzi shuāiduān-le tūi.  
Zhāngsan BA chair throw-break-PER leg  
'Zhāngsan has broken the chair's legs (after throwing it).'</n
b. *Zhāngsăn bà yīzi shuāiduān-le de tūi.  
Zhāngsan BA chair throw-break-PER DE leg  
Intended: 'the leg that Zhāngsan has broken off the chair'

Zhāngsan BA luggage place-at-PER bus-top  
'Zhāngsan has put the luggage on the bus.'

Zhāngsan BA luggage place-at-PER DE bus-top  
Intended: 'On the bus where Zhāngsan 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. Shuiguǒ, Zhāngsān xīhuān chī.
fruit Zhangsan like eat
'Fruit Zhangsan likes to eat.'

(114) c. Xin dàlù, Gēlún bù fāxiān-le.
new big-land Columbus discover-PER
'The New World is what Columbus discovered.'

(115) e. *Pí, Zhāngsān bā júzi bō-le
skin Zhangsan BA orange peel-PER
Intended: *Its skin, Zhangsan has peeled the orange off .'

(116) e. *Shūbāo, Zhāngsān bā qiānbǐ fāngzhī-le
bookbag Zhangsan BA pencil put-into-PER
Intended: 'It is into the bookbag that Zhangsan has put the pencil.'

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 bā xīnglǐ fāngzài-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 unergative 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 dāshān-le Liṣi.
   Zhangsan hit-wound-PER Liṣi
   ‘Zhangsan has wounded Liṣi (by hitting him).

   b. Zhāngsan bā Liṣi dāshān-je.
   Zhangsan BA Liṣi hit-wound-PER
   ‘Zhangsan has wounded Liṣi (by hitting him).

(2) a. Zhāngsan zhídào [Liṣi qù-le Měiguó]s.
   Zhangsan know Liṣi go-PER US
   ‘Zhangsan know that Liṣi has gone to the United States’.

   b. *Zhāngsan bā Liṣi zhídào qù-le Měiguó.
   Zhangsan BA Liṣi know go-PER US

The reason why (2b) is unacceptable is because Liṣi is not an argument of the matrix clause verb zhídào ‘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 Liṣi lǐkāi-le xuéxiào.
   Zhangsan angry-DE Liṣi leave-PER school
   ‘Zhangsan made Liṣi so angry that he left school.’

   b. Zhāngsan bā Liṣi qǐ-de lǐkāi-le xuéxiào.
   Zhangsan BA Liṣi angry-DE leave-PER school
   ‘Zhangsan made Liṣi so angry that he left school.’

(4) a. Nèi-tou dàxiàng xià-de Liṣi liāng-tiǎo tū zì duōsuō.
    that-CL elephant scare-DE Liṣi two-CL leg continuously shake
    ‘That elephant made Liṣi so scared that his two legs could not stop shaking.’

217
b. Nèi-tou 大xiàng bā Lìsì xià-de liǎng-tiáo tūi zhī duōsuǒ. 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.'

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 analysis. 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 bā. 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 bā and non-bā 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 bā-phrase is always closely linked to accomplishment verbs (Smith 1991). This is because, as Gao
(1993) argues, the preverbal bà-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 bà-phrase, as is shown in the following examples.

   Zhangsan eat-finish-PER meal.
   'Zhangsan has finished his meal.'

b. Zhāngsān bā fān chí-wǎn-le.
   Zhangsan BA meal eat-finish-PER
   'Zhangsan has finished his meal.'

   Zhangsan eat-full-PER meal
   'Zhangsan is full (from eating his meal).'

   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 beginning 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 bā 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 bā 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 bà-construction with an RVC in (7b) apparently can be expanded into a two-clause resultative structure with a bà-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 *bā*-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 *bā*-construction, they are assigned different underlying structures than subject-controlled sentences such as (6). This is illustrated as follows.

(9)  a. Object-control structure

```
(0) a. Object-control structure

      IP
       /\        /\  
      I'       I'
     /   \     /   \  
    NP1   VP1   NP1   VP0
     /\     /\    /\     /\  
     V1   Spec VP1 V1   Spec VP2
          Pro    IP      Pro    IP
                |        |        |
                V'      V'      V'  
                |        |        |
                V2      V2      V2
```

b. Subject-control structure

```
(0) b. Subject-control structure

      IP
       /\        /\  
      I'       I'
     /   \     /   \  
    NP1   VP0   NP1   VP1
     /\     /\    /\     /\  
     V1   Spec VP1 V1   Spec VP2
          Pro    IP      Pro    IP
                |        |        |
                V'      V'      V'  
                |        |        |
                V2      V2      V2
```
The distinct structures ensure that NP₂ is the first m-commanding⁠¹ NP for the Pro,² not NP₁, in a object-controlled structure in (9a), while only NP₁ 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 V₂ and V₁ can be phonologically adjacent to each other: move V₂ to join V₁ via Head-Movement so that we have sentences like those in (5a) and (6a). Or we can simply move NP₂ 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 NP₂ is moved to a position that can m-command the Pro.

This analysis also applies to (7), where V₁ 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 V₂ to join V₁ yields (7a) and moving NP₂ 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?

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 NP₂ as the subject. And because of structures like this, it is claimed that the function of bā 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 bāo.
   Zhāngsān eat DE very full
   Zhāngsan is very full after eating (his meal).

b. *Zhāngsān chī fàn de hěn bāo.
   Zhāngsan eat meal DE very full
   Intended: 'Zhāngsan is very full after eating (his meal).

   *Zhāngsān bā fàn chī de hěn bāo.
   Zhāngsān BA meal eat DE very full
   Intended: 'Zhāngsan is very full after eating (his meal).

(12) a. Zhāngsān bā dībān tuó de hěn gānjìng.
   Zhāngsān BA floor sweep DE very clean.
   'Zhāngsan has swept the floor very clean.

b. *Zhāngsān tuó dībān de hěn gānjìng.
   Zhāngsan sweep floor DE very clean.
   Intended: 'Zhāngsan has swept the floor very clean.

   *Zhāngsān tuó de dībān hěn gānjìng.
   Zhāngsan sweep DE floor very clean.
   'Zhāngsan has swept the floor very clean.

We can see that (11a) must be a subject-controlled structure because adding a fronted bā-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 V₂ from moving up to join V₁, 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 tiēshù kāi huā 'The iron trees blossom' and kūzhí 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, these idiom chunks are used in resultative structures

(13) a. Zhāngsān kū de tiēshū kāi-le huā.
    Zhangsan cry DE iron-tree open-PER flower
    'Zhangsan cried (so much) that something very unusual happened.'

    b. Zhāngsān bā tiēshū 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 tiēshù kāi-le huā 'the iron trees have blossomed' is a sentential idiom chunk, it must be the case that the NP tiēshù '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 bā 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 tiēshù '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 tiēshù can also have a referential reading. Thus the

---

3 A related sentence is shown in (i).

(i) Tiēshù 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 pāo-de hěn kuài.
   Zhangsan run-DE very fast
   'Zhangsan runs very fast.'

   b. Tā fá-DE hěn tūrán.
   he come-DE very sudden
   'He comes suddenly.'

(15) a. Zhāngsān pāo-de (rén) hěn lèi.
   Zhangsan run-DE man very tired
   'Zhangsan got tired from running.'

   b. Tā qī-DE (Lìsī) zhí duò jiāo.
   he angry-DE Lisi continuously 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: \[ \text{NP}_1 \ X \ [V-de \ [AP]_{VP} \ [VP]_S] \]

   b. a resultative structure: \[ \text{NP}_1 \ X \ [V_1-de \ [NP_2 \ VP_2]_S \ [VP]_S] \]

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 hěn lèi.
   Zhangsan say he very tired
   'Zhangsan says he is very tired.'

b. Zhāngsān_i pāo-de tā/i 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 hūnshēn fādōu.
   Zhangsan scare-DE all-body shake
   'Zhangsan is so scared that his whole body is trembling.'

b. *Zhāngsān bā hūnshēn xià-de fādōu.
   Zhangsan BA all-body scare-DE shake

I suggest that hūnshēn fādōu '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 bā. However, it is the following sentence that I believe puts Li's analysis in jeopardy.

(19) a. Zhāngsān xià-de Lǐ sī hūnshēn fādōu.
   Zhangsan scare-DE Lisi all-body shake
   'Zhangsan got Lisi so scared that his whole body is trembling.'

b. Zhāngsān bā Lǐ sī xià-de hūnshēn fādōu.
   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 bā. 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 pāo-de (rén/tuǐ) hēn lèi.
    Zhangsan run-DE body/leg very tired
    'Zhangsan's body/legs got tired from running.'

    b. *Zhāngsān bā rén/tuǐ pāo-de hēn 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 kūzhí [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 bā kūzhí 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 kūzhí '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 possible alternation between the postverbal object and preverbal bā-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; kū-de tā *īj hēn shāngxīn.
    Zhansan cry-DE he very sad
    'Zhangsan cried so much that he became very sad.'

b. Zhāngsān; kū-de zījī/yīj hēn shāngxīn.
    Zhansan 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 hūlī lūchū-le wēiba.
    Zhansan ask-DE fox reveal-PER tail
    'Zhangsan interrogated so persistently that the fox revealed its tail.'

b. Zhāngsān bā hūlī wèn-de lūchū-le wēiba.
    Zhansan BA fox ask-DE reveal-PER tail
    'Zhangsan interrogated so persistently that the fox revealed its tail.'

Huang argues that hūlī lūchū-le wēiba '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 hūlī '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 hūlī 'fox' is forced by the selectional restriction of the matrix verb wèn 'ask'. This leads Huang to conclude that hūlī '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 hūlī lūchū-le wēiba.
    Zhansan 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 hūlī '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 hūlī '(the) fox', as is shown in our translation. The referential reading is supported in the alternate bā-phrasal version in (23c). But we cannot get the idiomatic reading in (23c).
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 bā-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 analysis 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.

    Zhāngsān angry-DE Lìsī leave-NP school
    'Zhāngsān made Lìsī so angry that he left school.'

    b. Zhāngsān bā Lìsī qī-de līkāi-le xuěxiàō.
    Zhāngsān BA Lìsī qī-de līkāi-le xuěxiàō.
    'Zhāngsān made Lìsī so angry that he left school.'

    that-CL elephant xiā-de Lìsī two-CL leg continuously shake
    'That elephant made Lìsī so scared that his two legs could not stop shaking.'

    that-CL elephant BA Lìsī xiā-de liāng-tiáo tū zhi duōsūo.
    'That elephant made Lìsī 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. Zhāngsān zhídào $ Lìsī jīnjiān bù qù xuěxiàō.
    Zhāngsān know Lìsī today not go school
    'Zhāngsān knew that Lìsī does not go to school today.'

    b. *Zhāngsān zhídào Lìsī $ jīnjiān bù qù xuěxiàō.
    Zhāngsān know Lìsī today not go school

5 There is a less preferred reading in (24a), showing Lìsī as the subject of the embedded clause. However, this reading does not have a bā-alternation.

(i) Zhāngsān qī-de [[Lìsī]NP [līkāi-le xuěxiàō]vp].
    Zhāngsān angry-DE Lìsī leave-NP school
    'Zhāngsān so angry that Lìsī left school.'

(ii) *Zhāngsān bā Lìsī qī-de līkāi-le xuěxiàō.
    Zhāngsān BA Lìsī angry-DE leave-NP school
    Intended: Zhāngsān so angry that Lìsī left school.'

228
(27) a. Zhāngsān gào sù Lǐsī $ jíntiān bù qù xué xiào.  
    Zhangsan tell Lisi today not go school  
    'Zhangsan told Lisi that he does not go to school today.'

b. *Zhāngsān gào sù $ Lǐsī jíntiān bù qù xué xiào.  
    Zhangsan tell Lisi today not go school

In (26) the clause boundary pause occurs only before Lǐsī and we know that it must be the case that Lǐsī belongs to the embedded clause and functions as a subject. In (27), on the other hand, this pause only occurs after Lǐsī and therefore Lǐsī 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 Lǐsī is subcategorized for by the matrix verb and therefore we expect the clause boundary pause to occur after Lǐsī, not before it. This prediction is borne out in the following.

(28) a. Zhāngsān qǐ-de Lǐsī $ líkāi-le xué xiào.  
    Zhangsan angry-DE Lisi leave-PER school  
    'Zhangsan made Lisi so angry that he (=Lisi) left school.'

b. *Zhāngsān qǐ-de $ Lǐsī líkāi-le xué xiào.  
    Zhangsan angry-DE Lisi leave-PER school
    Intended: 'Zhangsan made Lisi so angry that he (=Lisi) left school.'

    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-tōu dàxiàng xià-de $ Lǐsī liāng-tiáo tǔ zhǐ duō suo.  
    that-CL elephant scare-DE Lisi two-CL leg continuously shake
    Intended: 'That elephant made Lisi so scared that his two legs could not stop shaking.'

Thus, these examples support the analysis that Lǐsī 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. Zhāngsān zhídào $ Lǐsī cǎn jiā-le jíntiān de yàn hū.  
    Zhangsan know Lisi participate-PER today DE banquet  
    'Zhangsan knew that Lisi came to the banquet today.'

b. *Lǐsī bèi Zhāngsān zhídào cǎn jiā-le jíntiān de yàn hū.  
    Lisi by Zhangsan know participate-PER today DE banquet
    'Lisi was known by Zhangsan that came to the party today.'

229
(31) a. Zhāngsan yāoqīng Lìsī $ cānjìa-le jīntiān de yànhūi.
    Zhangsan invite Lisi participate-PER today DE banquet
    'Zhangsan invited Lisi to come to the banquet today.'

    b. Lǐsī běi Zhāngsan yāoqīng cānjìa-le jīntiān de yànhūi.
    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 Lìsī 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 yāoqīng 'invite', which selects an NP and VP as its complements. Here the NP Lìsī 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.

    Zhangsan know Lisi very sad
    'Zhangsan knew that Lisi was very sad.'

    Lisi by Zhangsan know very sad
    '*Lisi was known by Zhangsan that was very sad.'

(33) a. Zhāngsān qǐ-de Lǐsī hěn shāngxīn.
    Zhangsan anger-DE Lisi very sad
    'Zhangsan made Lisi so angry that he (=Lisi) is very sad.'

    b. Lǐsī běi 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. Zhāngsān qǐ-de Lǐsī $ lǐkái-le xuéxiào.
    Zhangsan angry-DE Lisi leave-PER school
    'Zhangsan made Lisi so angry that he (=Lisi) left school.'

    b. Lǐsī běi Zhāngsān qǐ-de lǐkái-le xuéxiào.
    Lisi by Zhangsan angry-DE leave-PER school
    'Lisi was made so angry by Zhangsan that he (=Lisi) left school.'

    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. Lǐsī běi nèi-tou dàxiàng xià-de liǎng-tiáo tū zhǐ duōsuò.
    Lisi by that-CL elephant scare-DE two-CL leg continuously shake
    'Lisi was so scared by that elephant that his two legs could not stop shaking.'
7.2.3. The (lián)...dou Construction

Another piece of evidence against a clause analysis in some of the resultative structures comes from the (lián)...dou construction. In Gao (1995), it is argued intensively that the function of (lián)...dou is to make sure that the elements that (lián)...dou has scope over must occur preverbally. Thus in the following examples, yǐ-jū huà 'one word' is subcategorized for by the verb shuòbūchūlai 'be unable to say (out)' and in an ordinary sentence it occurs postverbally. However, in a sentence with the (lián)...dou construction, yǐ-jū huà must occur before the verb. What is relevant here is that yǐ-jū huà not only must occur preverbally, it can also occur at the clause initial position, thus marking the beginning of the clause.

(36) a. Lìshì shuòbūchūlai yǐ-jū huà.
Lìsì say-out one-CL word
'Lìsì cannot say a single word.'

b. Lìshì lián yǐ-jū huà dou shuòbūchūlai
Lìsì LIAN one-CL word DOU say-out
'Lìsì cannot say even a single word.'

c. Lián yǐ-jū huà Lìshì dou shuòbūchūlai
LIAN one-CL word Lìsì DOU say-out
'Lìsì cannot say even a single word.'

When (41a) is embedded, as is shown in (37), the same patterning is also exhibited.

(37) a. Zhāngsàn zhídào $ Lìshì shuòbūchūlai yǐ-jū huà.
Zhāngsān know Lìsì say-out one-CL word
Zhāngsān knows that Lìsì cannot say a single word.'

b. Zhāngsàn zhídào $ Lìshì lián yǐ-jū huà dou shuòbūchūlai
Zhāngsān know Lìsì LIAN one-CL word DOU say-out
Zhāngsān knows that Lìsì cannot say even a single word.'

c. Zhāngsàn zhídào $ lián yǐ-jū huà Lìsì dou shuòbūchūlai
Zhāngsān know LIAN one-CL word Lìsì DOU say-out
Zhāngsān knows that Lìsì 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. Zhāngsàn gàojìè Lìsì $ bù yào shuò yǐ-jū huà.
Zhāngsān tell-warn Lìsì not want say one-CL word
Zhāngsān warned Lìsì not to say a single word.'

b. Zhāngsàn gàojìè Lìsì $ lián yǐ-jū huà bù yào shuò
Zhāngsān tell-warn Lìsì LIAN one-CL word DOU not want say
Zhāngsān warned Lìsì not to say even a single word.'

c. *Zhāngsàn gàojìè lián yǐ-jū huà Lìsì $ dou bù yào shuò.
*Zhāngsān tell-warn LIAN one-CL word Lìsì DOU not want say
Intended: 'Zhāngsān warned Lìsì 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 Līsī shuōbuchūlai yǐ-jū huà.
    Zhangsan infuriate-DE Lisi say-out one-CL word
    'Zhangsan made Lisi so angry that he (=Lisi) couldn't say a single word.'

b. Zhāngsān qǐ-de Līsī lián yǐ-jū 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 yǐ-jū huà Līsī 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 Līsī 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 Līsī 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 shī. The semantics of the shī-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 shī is always placed before the element that shī is used to emphasize. However, there is a position that shī cannot be placed on. This is the position just before the unmarked complement. Examine the following.

(40) a. Zhāngsān nòngqíngchu-le zhè-jìan shī.
    Zhangsan make-clear-PER this-CL matter
    'Zhangsan clarified this matter.'

b. Shī Zhāngsān nòngqíngchu-le zhè-jìan shī.
   SHI Zhangsan make-clear-PER this-CL matter
   'It is Zhangsan who clarified this matter.'

c. Zhāngsān shī nòngqíngchu-le zhè-jìan shī.
   Zhangsan SHI make-clear-PER this-CL matter
   'Zhangsan did clarify this matter.'

d. *Zhāngsān nòngqíngchu-le shī zhè-jìan shī.
   Zhangsan make-clear-PER SHI this-CL matter
   Intended: 'It is this matter that Zhangsan clarified.'

Thus we can see that shī 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. Shī Zhāngsān nòngqíngchu-le Līsī hěn shángxīn.
    SHI Zhangsan make-clear-PER Lisi very sad
    'It is Zhangsan who has found out that Lisi was very sad.'
b. Zhāngsān shī nòngqǐngchu-le Lìsī hěn shāngxīn.
Zhāngsan SHI make-clear-PER Lìsī very sad
'Zhāngsan did find out that Lìsī was very sad.'

c. Zhāngsān nòngqǐngchu-le shī Lìsī hěn shāngxīn.
Zhāngsan make-clear-PER SHI Lìsī very sad
'Zhāngsan has found out that it was Lìsī who was very sad.'

b. Zhāngsān nòngqǐngchu-le Lìsī shī hěn shāngxīn.
Zhāngsan make-clear-PER Lìsī SHI very sad
'Zhāngsan has found out that Lìsī was indeed very sad.'

In (41) shī can be placed before Lìsī because Lìsī is the subject of the embedded clause. Thus if shī can be placed before Lìsī in (24), then it must be the case that Lìsī is the embedded subject, not the matrix object, for if it were the object, then the emphatic word shī could not be placed before it. The following examples show that Lìsī in the resultative structures is indeed the matrix object and not the embedded subject.

(42) a. Shī Zhāngsān qìde Lìsī liākái-le xuéxiāo.
SHI Zhāngsan infuriate-PER Lìsī leave-PER school
'It is Zhāngsan who made Lìsī so angry that he (=Lìsī) left the school.'

b. Zhāngsān shī qìde Lìsī liākái-le xuéxiāo.
Zhāngsan SHI infuriate-PER Lìsī leave-PER school
'Zhāngsan did make Lìsī so angry that he (=Lìsī) left the school.'

c. *Zhāngsān qìde shī Lìsī liākái-le xuéxiāo.
Zhāngsan infuriate-PER SHI Lìsī leave-PER school
Intended: 'It is Lìsī that Zhāngsan made so angry that he (=Lìsī) left the school.'

d. Zhāngsān qìde Lìsī shī liākái-le xuéxiāo.
Zhāngsan infuriate-PER Lìsī SHI leave-PER school
'Zhāngsan made Lìsī so angry that he (=Lìsī) did leave the school.'

The unacceptability of (42c) again suggests that Lìsī in the resultative structure of (24) is not the embedded subject. Therefore it need to be treated as the object of the matrix verb qī-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; qìde tā*ła liākái-le xuéxiāo.
Zhāngsan infuriate-PER he leave-PER school
'Zhāngsan made him so angry that he left the school.'
b. Zhāngsān qiūde zǐjiǎo likái-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 zǐjiǎo '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 qiū-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 qiū-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 qiū-de in our analysis to generate the sentence in (3a).

(45) a. The lexical entry for the transitive verb qiū-de

\[
\text{PHON} \langle \text{qi\u0103} \text{de} \rangle
\]

\[
\downarrow
\]

\[
\text{CAT} \left[ \begin{array}{c}
\text{HEAD verb-tr} \\
\text{SUBCAT} \left[ \begin{array}{c}
\text{NP}_{20} \text{ NP}_{20} \text{ VP} \left[ \text{SUBCAT} \langle \text{NP}_{20} \rangle \right] \end{array} \right] \\
to-the-extent-that \text{ infuriate} \\
\text{CAUSE INFURIATER [1]}
\text{ INTFURIATED [2]}
\text{ EXTENT leave school LEAVER [2]}
\end{array} \right] \right]
\]

234
We can see that the verb *qide* 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 *qī-de* given as (45b), which, in turn, is responsible for (3b).

(45) b. The lexeme for the intransitive middle verb *qī-de*

```
PHON {qī de}

CAT [HEAD verb-mid-intr

   SUBCAT [NP[1], NP[2], VP [SUBCAT (NP[2])]]]

SYNSEM|LOCAL

   [to-the-extent-that

      infuriate

      CONT CAUSE INFURIATER [1]

      INFURiated [2]

      EXTENT [leave school

                 LEAVER [2]]]
```

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 *qīsī* may change from a transitive verb to an intransitive one also by shrinking its valence to one.

(46) a. Zhāngsan qīsī-le  Līsī
Zhangsan infuriate-die-PER  Lisi
'Zhangsan made Lisi extremely angry.'

b. Zhāngsan bā Līsī qīsī-le
Zhangsan BA  Lisi infuriate-die-PER
'Zhangsan made Lisi extremely angry.'

c. Līsī qīsī-le
Lisi infuriate-die-PER
'Lisi was extremely angry.'
We can see that the examples in (46) characterize the verb *qiši* as a middle verb. This is also true of the verb *qīde* 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 *qī-de* (with an example below)

\[\text{45b}\]

```
[PHON (qi de)]
[SYNSEM LOCAL]
[HEAD verb-mid-intr]
[SUBCAT \(\text{NP}_{\text{IG}}\) VP \(\text{SUBCAT (NP)}\)]
[to-the-extent-that]
[CAUSE INFURIATER [1]]
[INTFURIATED [2]]
[EXTENT leave school]
[LEAVAR [2]]
```

c. Lisi *qi-de* likai-le xuěxiào.
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 *qīde* 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). Lisi bèi-qi-de likai-le xuěxiào.
Lisi BEI-angry-DE leave-PER school
'Lisi was made so angry that that he left school.'
(45) d. The fourth lexical entry for qi-de (the second lexeme)

\[
\begin{array}{c}
\text{PHON (qi de)} \\
\text{CAT}\text{HEAD verb-intr} \\
\text{SUBCAT} \langle \text{NP}_{\text{DE}}, \text{VP}\text{SUBCAT} \langle \text{NP}_{\text{II}} \rangle \rangle \\
\text{SYNSEM|LOCAL} \text{io-the-extent-that} \\
\text{CONT}\text{CAUSE be angry} \\
\text{DESCRIBED [1]} \\
\text{EXTENT leave school} \\
\text{LEAVER [1]} \\
\end{array}
\]

\[d. \text{Li} \text{\-si qi-de li\-kai-le xu\-xi\-ao.} \]
\[\text{Lisi angry-DE leave-PER school} \]
\[\text{'Lisi was so angry that he left the school.'} \]

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. Zh\=angs\=san \, k\=u \, de \, ti\=esh\=u \, k\=ai\-le \, hu\=a.
Zhangan cry DE iron-tree open-PER flower
\[\text{‘Zhangsan cried (so much) that something very unusual happened.’} \]

b. Zh\=angs\=san \, b\=a \, ti\=esh\=u \, k\=u \, de \, k\=ai\-le \, hu\=a.
Zhangan BA iron-tree cry DE open-PER flower
\[\text{‘Zhangsan cried (so much) that something very unusual happened.’} \]

Huang (1989) has criticized the translation in (13b) as incorrect because ti\=esh\=u ‘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) Zh\=angs\=san \, xi\-a\-de \, h\=u\=li \, l\=u\=chu\-le \, w\=e\=iba.
Zhangan 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 qi-de above, we also list the following for the verb xi\-a\-de (and ku\-de)
(45) e. A fifth lexical entry for qī-de (the third lexeme)

\[
\begin{align*}
\text{PHON} & \langle qī \text{-} de \rangle \\
\text{CAT} & \begin{align*}
\text{HEAD} & \text{verb-intr} \\
\text{SUBCAT} & \langle \text{NP[II, S]} \rangle
\end{align*} \\
\text{SYNSEMLOCAL} & \begin{align*}
to-the-extent-that & \text{be angry} \\
\text{CAUSE} & \text{DESCRIBED [II]} \\
\text{EXTENT} & \text{two legs not stop shaking}
\end{align*}
\end{align*}
\]

In (45e) there is no matrix object NP for bā-phrase alternation and this analysis is supported by the fact that the bā-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. Lìsī qī-de liǎng-tiáo tū̀ zhī duòsuò.
    Lìsī 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 tū̀ 'two legs', indicating that the embedded clause starts from this NP. Second, the emphatic SHI can also be placed before the NP liǎng-tiáo tū̀, showing that this NP is not the object. Third, the NP liǎng-tiáo tū̀ cannot undergo passivization, indicating that it is not the matrix object. Fourth, the NP liǎng-tiáo tū̀ can be under the scope of (liān)...dou and stay after the matrix verb. This is shown in the following examples.

(48) c. Zhāngsān qī-de $ liǎng- tiáo tū̀ *$ zhī duòsuò.
    Zhāngsān angry-DE two-CL leg continuously shake
    'Zhangsan was so angry that his legs could not stop shaking.'

d. Zhāngsān qī-de shī liǎng- tiáo tū̀ zhī duòsuò.
    Zhāngsān angry-DE SHI two-CL leg continuously shake
    'Zhangsan was so angry that it is his legs that could not stop shaking.'

e. *Liāng- tiáo tū̀ bèi Zhāngsān qī-de zhī duòsuò.
    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 qī-de liān liǎng- tiáo tū̀ dòu zhī duòsuò.
    Zhāngsān 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 量-条腿 '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 qí-de Líši liàng-tiáo tūī zhí duòsuò.
that-CL elephant angry-DE Líši two-CL leg continuously shake
'That elephant made Líši so angry that his (=Líši) two legs could not stop shaking.'

In (49) the postverbal NP Líši 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 qí-de *§ Líši § liàng-tiáo tūī zhí duòsuò.
that-CL elephant angry-DE Líši two-CL leg continuously shake
'That elephant made Líši so angry that his two legs could not stop shaking.'

c. Nèi-tou dàxiàng qí-de *shí Líši shí liàng-tiáo tūī zhí
that-CL elephant angry-DE SHI Líši SHI two-CL leg continuously
duòsuò. shake
'That elephant made Líši so angry that it is his two legs that could not stop shaking.'

d. Líši bèi nèi-tou dàxiàng xià-de liàng-tiáo tūī zhí duòsuò.
Líši by that-CL elephant scare-DE two-CL leg continuously shake
'Líši was so scared by that elephant that his two legs could not stop shaking.'

e. *Nèi-tou dàxiàng qí-de lián Líši liàng-tiáo tūī dòu zhí
that-CL elephant angry-DE LIÉN Líši two-CL leg DOU continuously
duòsuò. shake
Intended: 'That elephant made even Líši so angry that his two legs could not stop
shaking.'

f. Nèi-tou dàxiàng bā Líši qí-de liàng-tiáo tūí zhí duòsuò.
that-CL elephant BA Líši angry-DE two-CL leg continuously shake
'That elephant made Líši 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 qī-de

As we can see from (49), the bā-alternation in (49f) suggests that a seventh lexical entry is needed for qī-de, which is responsible for (45h) (through agent argument suppression rule) and (45f) (through middle transitivization).

(45) g. A seventh lexical entry for qī-de (the fourth lexeme)

Finally, I give the eighth lexical entry for qīde to explain the ambiguous (48a). Thus (45h) is responsible for the interpretation of (48b).
(45) h. The eighth lexical entry for the verb qi\de

\[45g\]

\[\downarrow\]

PHON (qi\ de)

| CAT [HEAD verb-mid-intr |
| SUBCAT (NP_m, S) |

SYNSEM\LOCAL

| to-the-extent-that |
| CAUSE INFURIATER [infuriate]
| INTFURIATED [INFURIATING]

| EXTENT [two legs not stop shaking] |

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 b\d\-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 te 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 Telefono 'eat' generally subcategorizes for an NP as its object, and so is Telefono 'have eaten' or Telefono-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 bā-marked complement. This is clearly shown in the following examples with the verb xià 'scare' and xià-de 'scare-DE'

(50) a. Zhängsán  xià-le  yì-tiào
     Zhangsan scare-PER one-CL
     'Zhangsan was scared once.'

   b. Zhängsán  xià-le  Líši  yì-tiào.
     Zhangsan scare-PER Lisi one-CL
     'Zhangsan scared Lisi once.'

   c. *Zhängsán  xià-le  tiào-le  qīlai
     Zhangsan scare-PER jump-PER up
     *Zhangsan scare-Lisi to jump up

   d. *Zhängsán  xià-le  Líši  tiào-le  qīlai
     Zhangsan scare-PER 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.

(51) a. *Zhängsán  xià-de  yì-tiào
     Zhangsan scare-DE one-CL

 b. *Zhängsán  xià-de  Líši  yì-tiào.
     Zhangsan scare-DE Lisi one-CL

 c. Zhängsán  xià-de  tiào-le  qīlai
     Zhangsan scare-DE jump-PER up
     'Zhangsan was so scared that he jumped up.'

 d. Zhängsán  xià-de  Líši  tiào-le  qīlai
     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 Zwický & Pullum (1983) and Zwický (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 8

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 occurrence 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 protorole 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 position 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 bā and non-bā 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 bā-construction. In this paper I have looked at various claims about the bā construction and argued for a head-final RVC analysis for the bā-construction. The advantage of this analysis is manifold. First, it explains why the verb in the bā-construction cannot be monosyllabic. Second, under this analysis, the bā-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 bā-phrase has many subject properties including definiteness/specificity. These properties lead to the claim in Tsao (1987) and Gao (1991) that the bā-phrase is the secondary topic/subject of the sentence. Together with the left-headed RVCs, the multiple ambiguous sentences are no longer a puzzle in the grammar. With the analysis of bā 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 bā-construction is shown to be closely linked (only) to right-headed RVCs. This analysis also explains why a verb with bā-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 zhī 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 treated as a lexically unrealized (phonologically null) resumptive pronoun. This seems to be a very skelchy claim and the comparison of the overt resumptive pronoun to the null resumptive 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 be-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 yī.

A.1.1. Instrumental yī
One of the major functions of the word yī is to introduce an instrumental NP. It has the same denotation as the contemporary word yòng. Examine the following.

(1) Tóu wǒ yī mù guā, bào zhǔ yī 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) Shěng zhī yī 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 qūdài chēngchē
    use walk replace ride-car
    'Take a walk rather than a bus.'

As we can see, in contemporary Chinese, the prepositional use 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 zhòng yú shǐ
    worry ending at beginning
    'Worry about the ending (right) from the beginning.'

(6) Xù chèng qí chē xiá sī yú mén wài.
    son-in-law rides 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) Zhōngguó rénmín gòngghéguó chéngqū yú yījìshíqī 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 kǎnfa, tā jīnwán bù huí lái le
    according-to I DE point-of-view he tonight not possible come LE
    'I don't think he will come tonight.'

248
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-bèn shū xiě yù Shànghǎi
   this-CL book write at Shanghai
   'This book was written in Shanghai.'

   b. *Tā xiě-le zhè-bèn 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-bèn shū.
      he ZAI*at Shanghai write-PER this-CL book
      'He wrote this book in Shanghai.'

(10) a. Nèi-fù huà chuàngzuò yū yǐjiǔliúsān 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 yū yǐjiǔliúsān 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) yǐjiǔliúsān 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 *zhī*:

The word *zhī*, 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)  Yòu pèng zhī yuǎn fāng lái, bù yī lè hù?
      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)  Zhěng zhī yòu xí wǔ.
      I from childhood practice martial-art
      'I have been learning martial arts since I was a child.'

Thus, *zhī* as a preposition seems to head a prepositional phrase but is positioned before the verb phrase. This is understandable, considering the fact that *zhī* 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, zi has gradually lost its independent word status. We often see it lexicalized with other word in compounds. The preverbal use has been replaced by cong (see Chapter 4 for discussion of cong as a case marker).

(13) a. Tā lái zì Běijīng.
    he come-from Beijing
    'He comes from Beijing.'

    b. Tā *zi/cóng Běijīng lái.
    he from Beijing come
    'He comes from Beijing.'

(14) Zì cong 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) zi become part of the compound word láizì. In (13b) we see that zi is no longer used in Chinese to denote a source argument. In (14) zi combines with cong to form a new preposition/complementizer. Source-denoting zi now can only be seen in some set phrases or idioms such as zì yóu 'since childhood', in which zì is not exchangeable with cong. This can be seen in the unacceptable *cóng yòu, even though cong 'from' is synonymous with zì in this usage, as is seen in another phrase cong xiǎo 'from childhood' in the following sentence.

(15) Tā cónɡ/zì xiǎo/wūsì de shíhou kǎishǐ 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 yù:
The world yù 'to' used to have the same meaning as contemporary gěi 'to give' to', as is shown in the following examples.

(16) Liú Bèi zèng jiān yù Guān Yù.
    Liu Bei award sword to Guan Yu
    'Liu Bei awarded Guan Yu with a sword.'

(17) Qìè bù rèn jià hài yǔ ní, 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 contemporary Chinese, the prepositional use of yù has disappeared. In its place we find the Case marker gěi which is used preverbally. Examine the following.

(18) a. Liú Běi gěi/*yù Guān Yù zèngsòng-le yī-bā jiàn .
Liu Bei to Guan Yu award-give-PER one-CL sword
'Liú Bei awarded Guan Yu with a sword.'

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 yù 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 zhī:

When it comes to denote destination in space or time, zhǐ is always used in archaic Chinese. Examine the following.

(19) Dài chuán xíng zhǐ Guānglín, zài shuò bù chǐ.
wait boat go until Guanglin then talk not late
'It is not too late to talk (about it) when the boat reaches Guanglin.'

(20) Zhǐ chūn, guǒ bǐng. Zhǐ sì yuè, xiè xué sì.
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) zhǐ introduces the destination of the trip by boat, and in (20) it is the time. This denotation is now replace by the verb dào 'arrive at/seek', as can be seen in the contemporary version in the following.

(21) Děng chuán dào-le Guānglín, wōmen zài tán zhě-jìàn shǐ.
wait boat arrive-PER Guanglin we then talk this-CL matter
'We will not talk about the matter until our boat reaches Guanglin.'

(22) Dào le chūn tiān, tā guórán bǐngle. Dào le shì yuè, tā tù xué
reach-PER spring he indeed ill-PER reach-PER April he spit blood
er sì.
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 zhǐ 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 zhǐ 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 dīshàng.
bookbag by that-CL person put-at-PER floor-top
'The bookbag was put on the floor by that person.'

(24) Shūbāo bèifàngzài-le dīshàng.
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 jǐnlái de nèi-ge rén qiāoqiāode fàngzài-le
bookbag by earlier enter-come REL that-CL person quietly put-at-PER
floor-top
'The bookbag was quietly put on the floor by that person whom came in earlier.'

(26) *Shūbāo bèi qiāoqiāode fàngzài-le dīshàng.
*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.
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 yú, 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 yú, jiàn. Some resume the function but have become verbs such as shòu. Only bèi remain both passive verbal morpheme and agent marker.  

---

(27) Xin er jiàn yì, zhōng er bèi bàng, nèng 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 Hù wáng bǐng shù pò yú Qí Qín. Wei Hui king army several defeat by Qí Qín 'King Hui of Wei’s army was defeated several times by (king of) Qí and (king of) Qín (‘s army).'

(29) Qín yǔ tiānxià jù bā, ze fēng bù héng xíng yú Qín by sky-under all disappoint thus decree not across carry-out at Zhōu ye. Zhou YE 'Qín is disappointed by all. Thus its decree is no longer carried out in Zhou.'

(30) Zhīhèng bèi Wèi Wǔ zhé wéi gǔ fēi. Zhīhèng by Wèi Wǔ relegate as drum official 'Zhīhèng was relegated by (King) Wǔ of Wei to a drummer.'

(31) Déng qǐ fēng, sǐ 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.'

---

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) Zhāngsàn gěi Lìsī tī-le yī 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 jiǎo, too) can also denote passives in the following example.

(ii) Nèi-zhí bǐ ràng/jiǎo wǒde xiǎo dì dī gěi-ràng-le. that-CL pen RANG/JIAO my little brother GĒI-throw-PER 'That pen was thrown away by my little brother.'
(32) Wèi Huí wáng de jùndū duōcí bèi/*yǔ Qíguó hé Qínɡuó de Wei Hui king DE army several-CL by Qi-state and Qin-state DE army defeat.
'King Hui of Wei's army was defeated by Qi and Qin's army several times.'

(33) Xiǎomínɡ zài xuéxiào shòu-le (lǎoshì de) pǐnɡ. Xiǎomínɡ ZAI school get-PER teacher DE criticize
'Xiaoming was criticized (by his teacher) in school.'

(34) Xiǎomínɡ zài xuéxiào bèi(*-le) lǎoshì pǐnɡ-le. Xiǎomínɡ ZAI school BEI-PER teacher criticize-PER
'Xiaoming was criticized by his teacher in school.'

(35) Xiǎomínɡ zài xuéxiào bèi-pǐnɡ-le. Xiǎomínɡ ZAI school BEI-criticize-PER
'Xiaoming was criticized in school.'

Thus (32) shows that the archaic agent marker yǔ 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) *Xiǎomínɡ zài xuéxiào bèi lǎoshì bèi-pǐnɡ-le. Xiǎomínɡ 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 bā, 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) Pingguò 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 huà bèi Xiǎoming cóng wūwài hāndāo-le that-pot flower by Xiaoming CONG house-outside move-to-PER 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 hierarchy 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 Xiǎoming bāi-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 Xiǎoming 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-tiǎo tū 'a leg' and therefore we understand that the broken leg belongs only to Zhangsan, not to Xiaoming.

(40) Xiǎomíngi bāi Zhāngsān jī shuāiduān-le proij yī-tiǎo tū. Xiaoming BA Zhangsan throw-break-PER one-CL leg 'Xiaoming has broken one of Zhangsan's legs.'

(41) Xiǎomíngi bèi Zhāngsān jī shuāiduān-le proi*j yī-tiǎo tū. 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-tiǎo tū '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) Jingcháì bá xiàotōu, xiàpào-le sán-ge pro’*i/j-
policeman BA pickpocket scare-run-PER three-CL  
'The cops scared away three of the pickpockets.'

(43) Jingcháì bèi xiàotōu, xiàpào-le sán-ge pro’*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-ti bá Xīāomíng gàn-le chūlái.  
Zhangsan CONG home-inside BA Xiaoming chase-PER out-come  
'Zhangsan has driven Xiaoming out of the home.'

b. Zhāngsān bá Xīāomíng cóng jiā-ti gàn-le chūlái.  
Zhangsan BA Xiaoming CONG home-inside chase-PER out-come  
'Zhangsan has driven Xiaoming out of the home.'

(45) a. Xīāomíng yòng dīngzi zài qiáng-shàng guà-le yì-fū huà.  
Xiaoming YONG nail ZAI wall-top hang-PER one-CL painting  
'Xiaoming has hung a painting on the wall with nails.'

b. Xīāomíng zài qiáng-shàng yòng dīngzi guà-le yì-fū 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 bèi-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.

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 Xīāomíng guà-le yì-fū 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. Júzì bèi Xīāomíng bā pí bō-le.  
Orange by Xiaoming BA skin peel-PER  
'The orange was peeled by Xiaoming.'

b. *Júzì bā pí bèi Xīāomíng 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. Xiăomíng bā dèngzi j shuāiduàn-le pro*yi tǐăo tūi.
    Xiaoming BA stool throw-break-PER one-CL leg
    'Xiaoming threw the stool and broke one of its legs.'

b. Xiăomíng zài dèngzi-shāng j shuāiduàn-le pro*yi tǐăo tūi.
    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 bā-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 phenomenon 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 unacceptability 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. Zhăngsăn dù xiǎoxué de shíhòu, tā gége yǐjīng dàxué biyè-le.
   Zhangsan read E school DE time he older brother already university graduate-PER
   'When Zhangsan was in elementary school, his brother had already graduated from university.'

b. *Xiǎoxué, Zhăngsăn dù de shíhòu, tā gége yǐjīng dàxué
   E school Zhangsan read DE time he old brother already university graduate-PER
   Intended: 'The elementary school, when Zhangsan was in, his older brother had already graduated from university.'
c. *Zhāngsān dù de shíhòu, tā gè ge yǐ jīng dà xué bié yè-le de
Zhāngsān read DE time he o.b. already univ. graduate PER REL
xíàoxué.
elementary school
Intended: 'The elementary school that when Zhāngsān was in, his older brother
had already graduated from university.'

Compare: d. Zhāngsān dú-le sān nián xíàoxué.
Zhāngsān read-PER three-year E. school
'Zhāngsān was in elementary school for three years.'

e. Xíàoxué, Zhāngsān dú-le sān nián.
E. school Zhāngsān read-PER three-year
'As for elementary school, Zhāngsān was there for three years.'

f. Zhāngsān dú-le sān nián de xíàoxué.
Zhāngsān read-PER three-year REL E. school
'the elementary school that Zhāngsān 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 běi-phrase as an
adjunct, then we predict that the NP after běi is not topicalizable or relativizable. The
following examples show that this prediction is borne out.

(50) a. Děngzi běi Xiāomíng shuāi duàn-le yī-tiāo tūn.
stool by Xiao ming throw-break-PER one-CL leg
'The stool was thrown and one of its legs was broken by Xiao ming.'

b. *Xiāomíng, děngzi běi shuāi duàn-le yī-tiāo tūn.
Xiao ming stool throw-break-PER one-CL leg
Intended: 'Xiao ming, the stool was thrown and one of its legs was broken by.'

c. *Děngzi běi shuāi duàn-le yī-tiāo tūn de Xiāomíng.
stool throw-break-PER one-CL leg REL Xiao ming
Intended: 'Xiao ming, by whom the stool was thrown and one of its legs
was broken.'

Not only is a běi-phrase an adjunct, it is also restricted to a VP adjunct. This is because
the běi-phrase can only appear between the subject and the VP. It cannot appear before the
subject, like some sentential adverbs such as míngtiān 'tomorrow', xiāoshíhòu 'during
childhood', etc. Examine the following.

(51) a. Nèi ěr xīguā běi Xiāomíng shuāichéng-le liāngbān.
that CL watermelon by Xiao ming throw-become-PER two-half
'The watermelon was broken in halves by Xiao ming.'

b. *Běi Xiāomíng nèi ěr xīguā shuāichéng-le liāngbān.
by Xiao ming that CL watermelon throw-become-PER two-half

(52) a. Xiāomíng míng guo Běijīng.
Xiāomíng tomorrow want go Běijīng
'Xiāomíng want to go Běijīng tomorrow.'
b. Mingtián Xiǎomíng yào qù Běijīng.
   tomorrow Xiaoming want go Beijing
   'Xiaoming want to go Beijing tomorrow.'

(53) a. Xiǎomíng xiǎoshíhou xǐhuàn dà lánqiú.
    Xiaoming childhood time like play basketball
    'Xiaoming enjoyed playing basketball when he was a child.'

   b. Xiǎoshíhou Xiǎomíng xǐhuàn dà 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-xín (yú) zuòtiān 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) (*Yǔ) zuòtiān xiàwǔ lái-xín shōudào-le.
    at yesterday afternoon come-letter receive-arrive-PER
    'The letter (to me) was received yesterday afternoon.'

(57) (*Yǔ) 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 yī 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.

260
(58) Yi xiànzài de sùdù, wǒmen tiānhūi 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) Yi 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) shàngjì de zhīshì 'according to the instructions of the superior', and yǐ as in yǐ wǒ de líjiè 'according to my understanding'. However, those words can be inflected with verbal morphemes 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 Thompson (1981) have discussed a list of (possible) coverbs/prepositions in contemporary Chinese. However, some of their prepositions like bā, cóng, zài, etc. are classified as (Case) markers in this paper. Other prepositions such as wèi, zhào, chāo, 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 yù, 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 contemporary Chinese. If we assume that Chinese is undergoing the change from SVO to SOV, this phenomenon is expected.
REFERENCES


Ding, Dan 1994. BA-Construction as a Causative Construction. Paper presented at *NACCL 6*, University of Southern California, Los Angeles.


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.)


Hashimoto, Anne Y. 1964. Resultative Verbs and Other Problems. POLA, 8.


___ and ___ 1976. Evidence against Topicalization in Topic Prominent Languages, in Charles Li (ed.).


267

Schachter, Paul 1976. The Subject in Philippine Languages: Topic, Actor, Actor-Topic or None of the Above? In Charlels Li (ed.)


