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The relationships between processes and participants in Chinese: A cognitive approach

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THE RELATIONSHIPS BETWEEN PROCESSES AND PARTICIPANTS IN CHINESE: A COGNITIVE APPROACH

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE DOCTOR OF PHILOSOPHY

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ABSTRACT

This thesis investigates the knowledge which Chinese speakers must have that enables them to produce and comprehend Chinese sentences because grammatically Chinese provides little formal marking for syntactic functions such as subject, object, etc. and participant roles such as agent, patient, etc. The present work also presents a model for the representation of such knowledge.

Using a cognitive approach which stresses the knowledge of users and the conceptual structures of the linguistic system, this study argues that Chinese speakers must know the conceptual relationships between processes and participants when processing Chinese sentences. Three types of knowledge are posited for the understanding of these relationships: knowledge about the world, linguistic knowledge, and pragmatic knowledge.

A classification of Chinese conceptual processes is done according the conceptual criterion PERIODICITY. Four basic types of conceptual processes are derived: State, Status, Action and Event, each of which corresponds to some syntactic properties and a different type of conceptual relationship. The categories of processes and participants have their hierarchical structures which are composed of two types of relationships: subordination and part-whole. Knowledge of
these structures enable Chinese speakers to interpret the conceptual relationships.

The difference between central participants and peripheral participants lies in the fact that the former are positionally marked, while the latter are usually related by prepositions. The distinction between participants and circumstantial is difficult to maintain since individual processes treat them differently. The participants presupposed by a processes are best regarded as prototypes to account for the metaphorical uses and the exclusion of the non-prototypical instances of a category. Participants are also grouped on the basis of the fixedness of their categories.

The conceptual relationships also have their hierarchical structure. At the top level, there are P1, P2 and P3. At the bottom, the relationships vary with each individual process. At the intermediate level, some conceptual roles can be established to capture the similarities of relationships. The types of knowledge investigated in this thesis are presented as entries in a conceptual dictionary.
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SYMBOLS AND ABBREVIATIONS

LE --- The perfective aspect marker
ZHE --- The continuive aspect marker
CL --- Classifier
BA --- The bā-construction marker
MA --- The yes-no question marker
BEI --- The passive marker
ZAI --- The progressive aspect marker
Inc. --- The inchoative marker
DER --- The resultative marker
det --- determiner
DE --- The possessive marker
ART --- article
PAST --- Past tense
GUO --- The indefinite past marker
MP --- Modal particle
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Chapter 1

INTRODUCTION

1.1 The Aims of this Thesis

This dissertation concerns what Chinese speakers know that enables them to produce and comprehend Chinese texts. Chinese is especially interesting in this regard because it provides so little formal marking for such grammatical relations as subject, object, etc., and participant roles like agent, patient, etc (See 1.2 for details). This dissertation investigates the knowledge which Chinese speakers use in processing Chinese sentences given that grammatical information contained in the sentences is not sufficient to mark syntactic functions. Further, it presents a model for the representation of such knowledge.

The present study was motivated by some previous studies of Chinese. Li and Thompson (1978) offered an account of various types of knowledge that are needed when Chinese speakers interpret the relations between clauses. They raised some interesting issues; e.g., Chinese speakers must know that the word order of complex sentences is constantly SVO, and they must know the predicate-argument patterns in order to interpret Chinese sentences, since Chinese does not have case morphology and agreement morphemes. However, they did not elaborate on what the knowledge of predicate-argument is, and, moreover, their claim that the word order of complex sentences in Chinese is constantly SVO is not correct. Chao (1968) and
Zhu (1982) observed that the relations between verbs and their objects were semantically diverse, e.g. the objects could represent agent, patient, instrument, existential, locational, or temporal, etc (See below, 1.2). But they did not explain how those semantic functions of objects in Chinese are derived, nor did they explain what kind of knowledge which Chinese speakers need for distinguishing them. Li and Thompson (1975) suggested that Chinese had undergone a change from SVO to SOV as a result of grammaticalization of serial verb constructions. Givón and Sun (1985) contended, based on their quantitative study of Chinese texts, that there had been no change of word order in Chinese, i.e. it is still SVO. They all are correct in some aspects. However, they did not explore what Chinese speakers know about the different word orders (See Chapter 3 for detailed discussions of previous studies).

The chief goal of this thesis is to model the knowledge which Chinese speakers have of the relationships between processes and participants in general, and to find solutions to the above-mentioned controversial issues in particular. The predicate-argument patterns proposed by Li and Thompson will be treated in terms of conceptual frames in this thesis, for we believe that Chinese speakers have a conceptual structure in which conceptual processes are clearly connected with participants. Moreover, the diversity of relations between verbs and nouns is regarded as multiplicity of the
conceptual relationships of processes to participants resulting from the differences in their conceptual categories. Also, we believe that Chinese speakers know the functions of the different possible word orders of a clause so that they can use them properly.

In order to understand the relationships of processes to participants, Chinese speakers, we propose, have three types of knowledge: knowledge about the world, linguistic knowledge and pragmatic knowledge. Knowledge about the world consists of the categories and hierarchical structures of processes and participants, and their other conceptual relationships. Linguistic knowledge contains the information about the linguistic structure of Chinese, which specifies the order of the lexical realizations of conceptual processes and participants. Pragmatic knowledge enables the speakers to use lexically different realizations of the same conceptual processes in different social and cultural contexts. Both the pragmatic knowledge and knowledge of the world are considered to be embodied in the conceptual system.

This thesis will concentrate on modeling the knowledge which Chinese speakers have of the individual processes and their participants in terms of the types of knowledge mentioned above. Using a formulaic notation, the knowledge involved will be represented in the form of entries analogous to entries of a dictionary. Thus, the result of our modeling will be organized in a Chinese conceptual dictionary which is
composed of the conceptual structures of processes, participants and prepositions.

1.2 Chinese as a 'Bare Bones' Language

The knowledge which has been characterized in the previous section is important for Chinese speakers because Chinese, which has formerly been referred to as a "bare bones" language, does not provide inflectional markers for the interpretation of sentences. In other words, the speakers of Chinese cannot depend on overt grammatical information to find out grammatical relations or participant roles, etc. For example, given the following sentences:

(1) a. Tā měitiān xǐ liángshuǐ
    he every day wash cold water
    'He washes (with) cold water every day.'

   b. Zhāngsān qu Měiguó le
      Z. S. go America LE
      'Z. S. went (to) America.'

Chinese speakers know that both Tā and Zhāngsān are the performers of the actions indicated by the lexical verbs in (1), hence the agents. In addition, they are aware of the fact that liángshuǐ in (1a) signals the thing that is used to wash, hence an instrument, while Měiguó in (1b) indicates the place where to go, hence a location. However, Chinese does not in most cases use morphological markers¹ to designate these participant roles as English does in some cases, as shown by the prepositions in the English gloss.

The positions of noun phrases in a sentence do not always signify grammatical relations, either. For instance, the
preverbal position is not limited the subject only, as shown below:

(2) a. Wǒ kàn diànyǐng le
    I see movie LE
    'I went to a movie.'

    b. Qiángshàng guà zhe yī fú huà
        wall up hang ZHE one CL picture
    'On the wall is hanging a picture.'

The preverbal position in (2a) is taken by the subject of the sentence, while in (2b) it is taken by the location of the sentence,² while the subject follows the verb.

In a similar way, the positions of nouns phrases do not completely determine their participant roles. For example, preverbal noun phrases can be agents, recipients, instruments, etc., as illustrated in (3):

(3) a. Wǒmen zuótiān kāi le yī ge huì
    we yesterday hold LE one CL meeting
    'We had a meeting yesterday.'

    b. Méi rén dōu gěi yī bān
        each person all give one copy
    'Each person will be given a copy.'

    c. Zhè zhī bǐ bù néng xiě xiǎo zì
        this CL pen not can write small character
    'This pen cannot write small characters.'

As with preverbal nouns, post-verbal position of noun phrases in Chinese do not uniquely determine their participant roles. Sentences in (1) have exemplified this diversity. Chao (1968:301) observes that 'an object in Chinese is less regularly tied up with the meaning of the goal of the action than it is in other languages'. He provides a lot of interesting examples (Chao 1968:309):
(4) a. Wǒ shuì dà chuáng  
    I sleep big bed  
    'I sleep on the big bed.'

b. Tā chī xiǎo wǎn  
    he eat small bowl  
    'He eats with the small bowl.'

c. Chí guǎnzi  
    eat restaurant  
    'eat (in a) restaurant'

d. Chí nǚ zhāodài³  
    eat female servant  
    'eat (where there are) waitresses'

e. Děng le bàn tiān  
    wait LE half day  
    'waited (for) a long time'

Chao (1968) adds that verb-object relations in Chinese are diverse. This results in two different types of solution. Some linguists like F. K. Li propose to give up the term 'object', and adopt 'complement' instead (cf. Chao 1968). Other linguists prefer to extend the notion 'object'. For example, Dexi Zhu, who is a leading grammarian of contemporary Chinese, believes that there are many types of object in Chinese. He (Zhu 1982:110-115) argues that objects which are semantically agent, patient, instrument, existential, locational and temporal can be identified in Chinese.

Moreover, the fact that subjects can follow verbs does not necessarily mean that Chinese has a free word order. The reason is that Chinese speakers know the normal sequence of the lexical realization of a process and its required participant(s), which is referred to herein as the unmarked order. If the order is changed to a different one, some
additional meanings result. Thus, it is referred to as the marked order. For example, the normal sequence of the process BUY and its required participants would be 'Buyer+BUY+Buyee', as shown in (5a):

(5) a. Tā mǎi shū le
    he buy book LE
    'He bought a/the book.'

b. Tā shū mǎi le
    he book buy LE
    'He bought the book/*a book.'

c. Shū tā mǎi le
    book he buy LE
    'As for the book, he bought (it).'

d. Shū bèi tā mǎi le
    book by he buy Le
    'The book was bought by him.'

e. Tā bǎ shū mǎi le
    he BA book buy LE
    'He bought the book.'

(5a) has the unmarked order and its meaning is neutral, while all other sentences have a marked order because the lexical realization of the process and its participants have a different sequence than the normal, hence having additional meaning. The differences between the unmarked order and the marked ones are indicated either by change of positions or positions plus prepositions. In processing Chinese, the speakers know the relations between the unmarked and the marked orders and can use them in different contexts. Consequently, word order constitutes part of the knowledge needed in interpreting Chinese sentences.
Accordingly, word order, as shown above, does not necessarily reveal participant roles, but interacts with participant roles to distinguish the unmarked and the marked orders. That is, Chinese speakers rely on their knowledge of participant roles to differentiate the unmarked order from the marked ones. As indicated in (5), they know the process 'BUY' has a buyer and a buyee as its required participants and that in the lexical realization the buyer precedes the process and the buyee follows the process. Any difference in the sequence of participants is a marked order. For example, if the buyee precedes the process but follows the buyer, the sentence has a contrastive meaning, as in (5b); if the buyee precedes both the buyer and the process, the buyee is the topic of the sentence, as in (5c); if the buyee precedes both the buyer and the process, and the buyer is introduced by the preposition bēi, the sentence is passive, as in (5d); if the buyee precedes the process and is preceded by the preposition bā, the process itself is the new information in the sentence, as in (5e).

So far, we have observed that Chinese does not have case morphology to indicate participant roles and that word order does not fully determine participant roles. This leads us to the question where these participant roles come from and how Chinese speakers know them. A closer examination shows that they are derived from by the relationships between processes and their participants. For example, Chinese speakers know
that in (5) the buyer is actually the performer of the action 'buying' and the buyee is actually the thing that is bought, hence affected by the process 'buying'. Therefore, we propose that Chinese speakers must know the relationships of processes to participants in order to produce and comprehend Chinese sentences. In particular, this type of knowledge enable them to know the roles of the participants, and in turn to interpret different word orders.

Furthermore, these relationships vary with the types of process. In other words, different groups of process have different relationships to their participants. Compare:

(6) a. Tā dǎ le xiǎotōu
    he hit LE thief
    'He hit the thief.'

b. Wǒ jiějie pà gǒu
    I older-sister fear dog
    'My older sister is afraid of dogs.'

c. Nèi kē shù dǎo le
    that CL tree fall LE
    'That tree fell.'

The process in (6a) is an action, and thus Tā is the performer of the action, while xiǎotōu is the undergoer of the action. In contrast, the process FEAR in (6b) expresses a kind of mental status. Thus, Wǒ jiějie is not a performer of an action, but an experiencer of a status and gǒu is not an undergoer of an action. Moreover, the process FALL in (6c) is neither an action nor a status, and its relationships to Nèi kē shù is of yet another type. In this connection, we believe that, although there is no grammatical indication of such
process groups, Chinese speakers have as part of their knowledge the properties of processes in their conceptual structure, and that these properties include the presupposed participant roles and prototypical types of participant that can fill each role, to understand the different types of relationships that exist between processes and participants.

In addition, Chinese speakers should know what kind of participants a process can take in order to distinguish the following sentences:

(7) a. Tā xiào wǒ
ehe laugh I
'He laughs at me.'

b. ?Tā xiào nà zhī gǒu
he laugh that CL dog
'He laughs at that dog.'

c. *Tā xiào zhè běn shū
he laugh this CL book
'He laughs at this book.'

As (7) shows, Chinese speakers know that the process 'LAUGH-AT' prototypically takes two participants, both of which are human beings, as in (7a). If the participant that undergoes the action is an animal, the sentence can be assimilated as a less prototypical participant with some difficulty. However, if the undergoer is an inanimate thing, Chinese speakers will not accept the sentence as a good Chinese sentence. To explain this kind of phenomenon, Li and Thompson (1978) suggest that speakers of a language know the predicate-argument patterns in interpreting sentences. However, we believe that the patterns of combination occur at the
conceptual level rather than the level of grammar. That is to say, the observed predicate-argument patterns exist because there are connections between processes and participants in the conceptual structure of Chinese speakers. We describe these patterns by means of conceptual frames of processes. Thus, a conceptual frame tells the speakers what kinds of participant an individual process presupposes.

These kinds of participant normally are stored in the form of prototypical categories. For example, (7) indicates that the conceptual frame for 'LAUGH-AT' in Chinese specifies the performer of the action prototypically as HUMAN and the undergoer of the action as HUMAN. In this sense, Chinese speakers also know the categories of participants and their hierarchy since in the conceptual structure a process is linked with the category of the participant. Accordingly, this kind of knowledge is also important for Chinese speakers to interpret Chinese sentences, although it is not denoted by grammatical information.

So far, it has been shown that Chinese speakers produce and understand Chinese texts without any difficulty although Chinese grammar provides little information about grammatical relations, participant roles, etc. We have claimed that they must know the relationships of processes to participants in order to interpret the roles and they must know the categories of processes in order to understand the relationships. Moreover, they also know what kind of participants cooccur
with a process. In this case, they have information about the categories of participants and their structures. The present study, therefore, will concentrate on modeling these types of knowledge.

1.3 The Relevance of Cognitive Linguistics

As argued in the previous section, Chinese users must have various types of knowledge in their conceptual structure which they need in order to process Chinese sentences because grammatically the language does not provide sufficient information for the interpretation. Moreover, we set as our task to model such knowledge. Now the question is how we can accomplish our goal and what kind of approach or theoretical framework we will adopt. In the previous section, we have already adopted the view that speakers must have knowledge at a conceptual level in addition to the grammatical level.

Although there are many different approaches to the relations between processes and participants,\(^4\) most of them are not amenable to our endeavor in this study (See Chapter 3). This thesis specifically adopts cognitive linguistics as its theoretical framework since we find that it is compatible with our goal. First, cognitive linguistics regards as its goal the modeling of the knowledge which the speakers of a language use to produce and understand linguistic texts. Moreover, cognitive linguistics stresses the importance of conceptual categories and their structure, and the
relationships of processes to their participants (Lakoff 1987 and Lamb 1991a).

In this study, the principles of cognitive linguistics which are pertinent to our study will be followed. These include the notion of prototypicality, the symbolic nature of linguistic system, the structure of linguistic knowledge as networks, redundancy in linguistic information, etc. They are important because they help us solve the problems which we encounter in simulating the knowledge (Refer to Chapter 2).

1.4 The Scope of this Thesis

As the title suggests, this thesis is mainly concerned with Chinese. English examples, however, are cited for illustrative purposes or for comparison with Chinese whenever necessary. Sometimes, examples from other languages may appear in examining other approaches to processes and participants.

Since the focus of this study is on the conceptual frames of processes and participants, linguistic knowledge concerning low-level phonological phenomena in Chinese will not be mentioned unless it bears on our topic. Thus, the bulk of this treatment concerns the structure of information at the conceptual level, i.e. the semantics and pragmatics of Chinese texts in the traditional sense. However, Chinese speakers' knowledge of the functions of different word orders of a clause, which has traditionally been treated at the syntactic
level, will be included as part of the knowledge which this thesis sets out to simulate.

The data treated in this thesis consist chiefly of simple clauses, excluding clauses containing serial verbs, verbal compounds or verbs that take a whole proposition as their second participant, that is, containing embedded clauses. For example, of the following clauses

(8) a. Tā chī fàn
    he eat meal
    'He eats a meal.'

    b. Tā chī fàn shuì jiào
        he eat meal sleep sleep
        'He eats and sleeps.'

    c. Tā chī-wán fàn
        he eat-finish meal
        'He finishes eating.'

    d. Tā xiāngxin wǒ huí lái
        he believe I will come
        'He believes that I will come.'

(8a) will be the only type of sentence used as the data for constructing the conceptual frames for processes and participants. The reason is that once the conceptual frames are set up, they can be easily extended to serial verb or verbal compound clauses. Furthermore, they can also be extended to complex sentences.\(^5\)

Concepts of the kind represented by adjectives in English are treated as processes in Chinese. The reason is two-fold. For one thing, many linguists refer to them as 'adjectival verbs' since they have a conceptual frame that relates them to their participants like intransitive verbs in general
(Anderson 1971, Dowty 1979). For another thing, Chinese adjectival verbs behave more like verbs than English adjectives since they do not require the use of the verb shi 'to be' and they cooccur with some of the aspectual particles.

About 300 Chinese verbs have been chosen as the basis of this study. Their selection here does not necessarily mean that these verbs are more important than others. They are selected because they have appeared in the previous studies by Chinese and western scholars, hence providing a reference point for future investigations. Moreover, this number is large enough to include various types of verbs which show significantly different behavior. In this connection, they are representative of all Chinese verbs. Accordingly, they constitute a sufficient basis for establishing the types and structures of knowledge for the conceptual frames of processes in Chinese.

The bulk of our data for constructing the conceptual frames of processes is taken from two collocational dictionaries of Chinese verbs which were published in China. Since they do not contain sufficient examples of colloquial usage of the verbs, the author has provided some additional examples of his own. However, they have all been checked by three informants who speak the Beijing Mandarin dialect. The sources of the examples are not indicated unless they come from some previous studies.

1.5 The Organization of this Thesis
The remainder of this study consists of two parts. In Part I, an effort will first be made to build a theoretical basis for our treatment, with an eye on previous work. Then, this theoretical framework will be applied to Chinese data to obtain some insight into the relevance of conceptual categories of processes and participants, and conceptual frames of processes in cognitive processing of linguistic information.

Chapter Two deals with the basic principle of cognitive linguistics. Emphases will be given to those which are relevant to our treatment. General guidelines for our research will emerge there.

Chapter Three reviews the treatment of processes and participants in other approaches. It will also examine some previous studies concerning Chinese verbs and case frames. Thus, it will be clear therein why a cognitive approach should be attempted and where to start.

Chapter Four is devoted to the discussion of the types of knowledge contained in the conceptual structure. The categories and hierarchies of processes and participants in Chinese are investigated.

Chapter Five discusses the organization of all these types of knowledge in a Chinese dictionary in which processes, participants and conceptual frames are treated as entries.

Chapter Six is concerned with presentation of information in the conceptual frames. The characteristics of participants
are explored and the distinction between circumstantials and participants is also examined. The notion of prototypicality is used in discussing different types of participants.

Chapter Seven focuses on the conceptual relationships between processes and participants and relationships among the participants of processes in conceptual frames.

Chapter Eight concludes Part I.

Part II contains the conceptual dictionary which includes the conceptual structure of participants, processes and prepositions.
Notes to Chapter 1

1. Whether Chinese has prepositions is still a controversial question since many of them can also be used as verbs and are not so common as the prepositions in English. See Li and Thompson (1982) for details. This, however, does not affect our argument here because they, whatever you may call them, are not always present to indicate participant roles in Chinese. Also see 6.1 for the functions of Chinese propositions.

2. Some linguists like Zhu (1982) regard qiāngshàng as the subject since he defines 'Subject' as the topic of the sentence. Following his approach, we would have to say that a prepositional phrase can be used as the subject. However, the postverbal position of yì zhāng zhàopiān has to do with their definiteness, i.e. it can never be used as the topic. Thus, it is unable to occur pre-verbally.

3. This sentence is not acceptable to many Mandarin Chinese speakers.

4. Most of the previous approaches do not use 'process' and 'participant' (See Chapter 3).

5. Of course, other types of knowledge are needed to comprehend complex sentences, in addition to knowledge about the conceptual frames of processes. See Li and Thompson (1978) for a hypothesis about the knowledge required for interpreting serial verb relations and clause relations.
Chapter 2
PRELIMINARIES IN COGNITIVE LINGUISTICS

2.1 The Goals of Cognitive Linguistics

According to the Oxford English Dictionary, the word 'cognition' comes from the Latin word cognition- which means 'getting to know, acquaintance, notion, knowledge, etc'. Thus, the word 'cognitive' is defined as 'of or pertaining to cognition, or the action or process of knowing; having the attribute of cognizing.' Academically, it has been, since 1940's, used by psychologists to refer to their endeavor to investigate how the mind functions. Since mid-50's, it has gained prominence as a result of the emergence of cognitive science (cf. Gardner 1985). It has now become a buzz-word for workers in a number of disciplines such as linguistics, anthropology, etc. who are interested in the workings of the mind, but have very little in common in their theory and methodology. However, this diversity does not prevent them from arriving at some consensus, viz. cognitive science deals with knowledge, hence its aim is to figure out how the mind works (cf. Gardner 1985, Johnson-Laird 1988, Lamb 1990).

Although a lot of linguists have committed themselves to the study of human language in its relation to perception and knowledge ever since Aristotle (See Gardner 1985; Swiggers 1988 for details), the word 'cognitive' was not explicitly used until Chomsky (1957) claimed that linguistics is just a branch of cognitive psychology, an idea which has not been
widely accepted because Chomskyan theories clash with what Gardner calls the established truth\(^1\) in psychology (cf. Gardner 1985). The linguist who was the first to introduce the term in its usual sense is Sydney Lamb (1971). He refers to his linguistic theory as cognitive linguistics since it models the linguistic system of the speaker as a system that can be used for the processes of production and comprehension. According to him, cognitive linguistics aims at representing the speaker's internal information system which makes it possible for him to speak his language and understand utterances received from others (Lamb 1971). The word 'information' here is equivalent to 'knowledge', which has now become popular and means the thing that enables the speaker to use language, but it is radically different from the Chomskyan interpretation of the term, which means the implicit ability to produce an indefinite number of sentences of a language. Lamb's theory was advanced in the mid-60's as an alternative to generative linguistics, for he found that transformational grammar was too remote from actual production and recognition, and that its goal to provide a system of rules which can generate all the sentences of language and only those was totally unrealistic (Lamb 1971).

Later on, some other linguists began to apply the term to their theories in order to distinguish themselves from the then dominant transformational trend. For example, Lakoff and Thompson (1975a and 1975b) propose the adoption of some
version of cognitive grammar. The reasons given are similar to those of Lamb (1971). They believe that there is a direct and intimate relation between grammars and mechanisms for production and recognition. In their view, grammars are just a collection of strategies for understanding and producing sentences (Lakoff and Thompson 1975a:295). Langacker (1982) presents another alternative to the transformational approach. He calls for a more natural and broadly-grounded conception of linguistic structure since he found that syntax is not autonomous, but forms a continuum with lexicon and morphology. For him, semantic structure is language-specific, involving layers of conventional imagery. Semantic structure is, therefore, conventionalized conceptual structure. And grammar in turn is the conventional symbolization of semantic structure (Langacker 1982:23). He later (1987a) summarizes his decade-long efforts of working out the alternative and renames his theory cognitive grammar.

In recent years, the shift of focus has gained tremendous momentum within linguistic circles. Many linguists have begun to give their attention to this new trend and the amount of literature has been increasing. Accordingly, the term 'cognitive linguistics' has gained a much greater acceptance. This, however, does not necessarily mean that every practitioner agrees upon all the basic assumptions. In fact, proponents of cognitive linguistics approach the subject matter from different perspectives, for they differ in their
theoretical commitment and area of special interest. Thus, a lot of controversies still exist and many disputes remain to be solved.

Cognitive linguistics, as suggested above, is still an evolving field. It is very broad in scope and radically divergent in conception. Consequently, a definitive description of even the most basic notions would be a difficult task. Nevertheless, the disparity among the conceptions of language of different schools appears to be less than they might claim. The methodologies are in essence more congruous than contentious as they seem on the surface. A closer look at the literature, therefore, shows that a general theoretical framework is beginning to take shape and the diverse points of view are in the process of converging. In what follows, we try to focus on the consensus. In the areas where views are different, we attempt to take our own stand.

2.1.1 Linguistics as Part of Cognitive Science

As the term 'cognitive linguistics' suggests, it deals with cognition and knowledge. In this connection, it is similar to cognitive science since cognitive science is also concerned with the workings of the mind. Therefore, the meaning of cognitive linguistics cannot be understood fully without knowing what cognitive science is. Unfortunately, practitioners in cognitive science themselves differ as to what are exactly the nature and goals of cognitive science.
According to the Random House Dictionary, for example, cognitive science is 'the study of the precise nature of different mental tasks and the operation of the brain that enable them to be performed, engaging branches of psychology, computer science, philosophy and linguistics'. Gardner (1985:6) defines cognitive science as a contemporary, empirically based effort to answer long-standing epistemological questions, particularly those concerned with the nature of knowledge, its components, its sources, its development, and its deployment. He believes that philosophy, psychology, artificial intelligence, linguistics, anthropology and neuroscience are cognitive sciences. Lakoff (1987:xi) sees cognitive science as 'a new field that brings together what is known about the mind from many academic disciplines: psychology, linguistics, anthropology, philosophy and computer science'. He goes on to explain that cognitive science seeks to answer questions concerning the nature of reason, the application of experience and the nature and organization of conceptual systems. Others tend to take a more formal line. For instance, Johnson-Laird (1988:9) claims that 'cognitive science tries to elucidate the workings of the mind by treating them as computations, not necessarily of the sort carried out by the familiar digital computer, but of a sort that lies within this broader framework of the theory of computation'. Simon and Kaplan (1989:1) hold a similar view. They look at cognitive science as the study of
intelligence and its computational processes in humans (and animals), in computers, and in the abstract. In their view, the contributing disciplines of cognitive science include psychology, artificial intelligence, linguistics, philosophy, and neuroscience. It appears from the above descriptions that there does exist some consensus. For example, they all claim that cognitive science studies the mental capacities. Moreover, linguistics is invariably regarded as a component of cognitive science.

As a branch of cognitive science, linguistics certainly should concern itself with the workings of the mind. But, this is not to say that every branch, or every school of linguistics takes 'cognition' as its objective. For example, phonetics, historical linguistics, descriptive linguistics (taxonomic linguistics) do not deal with cognitive matters. Nor does transformational grammar, whose chief claim is that there exists a separate linguistic ability which is independent of other cognitive capacities of human intelligence. This faculty is genetically determined and can be located in certain area of the brain. Accordingly, the aim of generative linguistics is to characterize that faculty by working out the set of rules for generating an indefinite number of sentences of a language. These rules are the manifestations of the some general principles across languages and constitute the universal grammar which is passed on genetically.
Naturally, Chomsky's ideas have generated little enthusiasm in cognitive science except that a number of psychologists have tried but failed to prove the 'psychological reality' of transformations (Fodor et al. 1974). Most psychologists have found that Chomsky's framework cannot be directly applied to their research since not only are Chomsky's formulations highly abstract and subject to frequent change, but the results of applying them have not been consistent with his models. For example, some psychologists have sought to account for language acquisition in terms of Chomsky's categories and definitions, but these efforts have generally been judged failures (Gardner 1985:215). The majority of cognitive scientists have remained skeptical about the overall relevance of his theory for their pursuits because his ideas and definitions clash with the established truth in psychology. Accordingly, they have been suspicious of his formal method, opposed to his ideas about language as a separate realm and skeptical with respect to his belief in innate ideas (Gardner 1985:214).

Despite its claim that it attempts to describe a speaker's implicit knowledge of his language, what Chomskyan linguistics has been doing is far from the psychological reality of linguistic processes since his theory precludes what a speaker actually does in production and comprehension, i.e. speakers' performance (Lamb 1981:2). As Lakoff and Thompson (1975a) put it, there is a conflict between
generative linguistics and any linguistic theory with reasonable claims to psychological reality. The direct result of this conflict is the split between Lexical Functional Grammar as developed by Joan Bresnan and others who seek to take psychological reality into account, and the Government and Binding Theory which still insists on the primacy of formalism and competence. On the other hand, generative grammarians themselves admit this disparity. In Anderson's (1989:809) view, many linguists (i.e. generative linguists—J.Z.) 'have focused more on the potential value of the tools provided by generative grammar for studying language (and languages) than on its potential role in uncovering the structure of the mind'. Wasow (1989:197) echoes Anderson's opinion in saying that 'the asymmetry between sophisticated competence theories and fairly rudimentary performance theories has had the effect of insulating linguistic theory from decisive testing for psychological reality'. We doubt their claim that generative grammar has the potential to uncover the structure of the mind and that it implies even rudimentary performance theory because it does not care about performance theories at all.

Moreover, some other theories in linguistics do not see themselves as directly related to uncovering the structure of the mind. This is exemplified by Gazdar et al. (1985) when they say that 'it is possible, and arguably proper, for a linguist (qua linguist) to ignore matters of psychology'.
Then what branch or approach in linguistics is directly related to cognitive science? Simon and Kaplan (1989:5) list computational linguistics and psycholinguistics. Their conclusion may be in some way justified. However, we believe that cognitive linguistics should also be included since it has clearer objectives. For one thing, its proponents explicitly present its goal as contributing to cognitive science. For example, Lakoff and Thompson (1975a:307) assert that the study of cognitive grammar is part of the study of cognitive capacity as a whole. According to them, this capacity includes at least the representation of knowledge, memory, processing strategies and mechanisms, reasoning, principles of social interaction, and whatever other abilities or knowledge enable one to use language. Furthermore, Lamb (1981, 1991a) declares that the aim of cognitive linguistics is to study the mind through the study of language and to understand knowledge. For another thing, cognitive linguistics regards psychological reality as the ultimate criterion for the success of a theory. For instance, Lakoff and Thompson (1975) stipulate that any model of grammar should be psychologically real. Langacker (1987a:12) explicates that an account of linguistic structure should articulate with what is known about cognitive processing in general because language is an integral part of human cognition (See also Reich 1973).
It may thus be concluded that cognitive linguistics is a branch of linguistics that investigates human cognition through the study of language. In other words, cognitive linguistics deals with the cognitive processes that are going on in an individual speaker's mind when he produces and understands linguistic texts, and the cognitive structures that make those processes possible. Its aims, therefore, can be said to provide a psychologically real account of those processes with linguistic evidence. Thus, it contributes to cognitive science as a whole in its own way. This contribution is important because language is, as Langacker (1987a) suggests, part and parcel of human cognition.

While making contributions, cognitive linguistics also draws from the findings of other contributing disciplines. Cognitive linguists should expect to find a great many useful concepts and insights about language behavior and cognitive processes in general in those disciplines. What is more important is that the theories of cognitive linguistics should not run counter to the findings of psychology, neuroscience, artificial intelligence, etc (Reich 1973). On the contrary, cognitive linguists should 'design their models for maximal compatibility with the findings of cognitive scientists' (Langacker 1987a:6). Finally, the findings of cognitive linguistics should be tested against the findings in cognitive science in general. That is, the models used 'must not
contradict anything we know about the structure and operation of the brain' (Sullivan 1980:301).

The present study follows the commitment of cognitive linguistics to the uncovering of the workings of the mind through the study of language. In particular, it is concerned with the conceptual structure of Chinese speakers in comprehending Chinese texts and coding their experience in terms of the relationships of processes to participants. In this way, it seeks to model a portion of the cognitive system of Chinese users in linguistic processing.

2.1.2 Modeling Linguistic Processes

As stated in the previous section, cognitive linguistics aims at constructing a psychologically real model for linguistic processes. This leads to the question how this goal can be achieved. The task is exceptionally difficult since the mind is not directly observable, as is the case in cognitive science (Langacker 1987a; Lamb 1990). Sullivan (1980:324) concludes that language description is essentially a black box problem in engineering: You may know what goes in and what comes out, but you cannot know the structure inside. Here we do not totally agree with him, for there are things already known about the brain, e.g. the brain is made up of neurons which have connections among themselves and neurons are fired through activation along those connections, although we are far from clear about exactly how the brain functions.
In this sense, language description is essentially a grey-box problem (cf. Reich 1973).

Accordingly, cognitive linguists, ideally taking into consideration what is known about the brain, construct models of linguistic structures and processes, based on the actual linguistic data, viz. studying the information system of language users through what they hear and utter, but not the theoretical set of well-formed sentences generated by a theoretical ideal speaker (Lamb 1991a). Moreover, even data from people who speak a second or third language with varying degrees of proficiency, or from unintended puns and slips of the tongue (cf. Lamb 1991a) can be employed for modeling linguistic processes. As known to all, those aspects of linguistic phenomena are regarded as performance and are thus rejected as the legitimate object of study by generative linguistics. Cognitive linguists, on the contrary, are interested in the processes of production and comprehension. For instance, Langacker (1988d:129) calls for a usage-based model of language structure if claims of psychological reality are taken seriously. The goal of cognitive grammar, according to him (1988d), is to characterize those psychological structures that constitute a speaker's linguistic ability. In fact, cognitive linguists normally do not maintain the distinction between competence and performance. At least, they believe that the two are closely related. If there is competence, it is the competence to perform (Reich 1973; Lamb
1989). Consequently, a 'competence model' that cannot perform, according to Lamb (1989), may well be useful for some purpose, but it has no direct relevance to cognitive linguistics. Langacker (1988d:130) argues that the distinction between competence and performance is unclear and problematic. Actually, the effect of this distinction, he notes, has been to insulate generative grammar from any possible attack based on its obvious psychological implausibility.

There are several types of linguistic processes: comprehension, production, self-modification (including expansion) and interaction with other mental subsystems (Lamb 1991a). Consequently, a successful cognitive model of human linguistic ability should be able to account for those processes in a unified manner. It follows that the theoretical framework should be broadly conceived with an eye on the general cognitive systems of humans as a whole. According to Lakoff and Thompson (1975a:308), the processing, perception and production mechanisms are common to all normal human beings. In addition, the model should also show how those process are related, and at the same time how they are different from each other.

Most important of all, a model of linguistic processes should be capable of explaining why those processes are possible. In this regard, cognitive linguistics has its consensus, i.e. it is the information or knowledge system that
makes those processes successful (Winograd 1983; Lamb 1989). In this vein, the chief task cognitive linguists confront, therefore, is to model the information or knowledge system in the mind of a speaker in a way that is consistent with the findings about the brain within cognitive science as a whole (cf. Reich 1973).

In this study, actual data in Chinese are used as the basis of constructing a model of a portion of the conceptual structure for linguistic processing. Emphasis is placed on the types of knowledge that are needed in encoding and decoding Chinese texts in terms of clauses. An information-based and usage-based approach is adopted.

2.2 The Basic Principles of Cognitive Linguistics

2.2.1 Prototypicality in Linguistic Categories and Relations

One important notion to which cognitive linguistics adheres is that linguistic relationships and categories tend not to be clear-cut and sharply defined. This principle is directly opposed to what the generative school believes to be its job, namely, to characterize the well-defined set of grammatical sentences. Cognitive linguistics sees that goal as unrealistic because the boundary between grammatical and ungrammatical is not a boundary at all, but a continuum. In this case, one deals with continuous rather than discrete phenomena (Lamb 1971:101).

In addition to grammaticality, nondiscreteness also exists in other linguistic categories. For example, Langacker
(1984 and 1987a) shows that phonology, morphology, lexicon, syntax and semantics form a continuum. It follows that syntax is not autonomous. His findings run counter directly to the tenet of generative linguistics that syntax is an autonomous component distinct from both semantics and lexicon. Langacker (1987a:1-2 et passim) notes that syntax and semantics are inseparable because they do not constitute an autonomous formal level of representation. They can be divided into separate levels only arbitrarily since they form a continuum of symbolic structures which do not show where syntax leaves off and where semantics begins. In Langacker's (1984:23) view, syntactic units are bipolar, with semantics and phonology standing at the ends. This implies that syntax can only be spoken of in terms of phonology and semantics. This observation leads to the assumption that in cognitive linguistics syntax becomes less important since it does relatively little in communication (Lamb 1987:54). This view also coincides with the findings from workers in A.I. like Roger Schank. Since their objective is to design programs that understand sentences and stories, Chomsky's syntax-centered framework is not suited for their enterprise. As Schank (1972) put it, semantics and pragmatics are central in language, and syntax is relatively unimportant. For him, moreover, it is impossible to produce a model of language alone ... apart from beliefs, goals, points of view and world knowledge (Schank 1980:36).
To say that there is no discreteness does not necessarily mean that people do not make categorial judgements. Cognitive linguistics makes two claims on this matter. On the one hand, linguistic categories should show prototype and basic-level \(^2\) effects in our conceptual systems. On the other hand, the study of the nature of linguistic categories should contribute to a general understanding of cognitive categories in general since linguistic categories should be of the same type as other categories (cf. Lakoff 1987). Or more precisely, most so called linguistic categories are cognitive categories (Lamb 1991a).

The prototype theory has been developed by Rosch and her associates. Basically, it stipulates that people base their categorization on prototypes, rather than class-membership of the set-theoretic kind. Rosch's (1973) experiments demonstrate that categories are often organized around prototypical instances (cf. Langacker 1987a:17). People accept these instances as common, garden variety members of the category, while the nontypical instances are assimilated to a class or category by being construed as matching and approximating the prototype. According to Rosch's theory, membership is a matter of degree. The central members are the prototypical instances, whereas other instances form a gradation from central to peripheral depending on the extent to which they are alienated from the prototype (cf. Langacker 1987a:17).
Rosch's model has been enthusiastically acclaimed and applied by Lakoff (1987) and Langacker (1987a). For example, Lakoff (1987:58) employs prototype theory in his study of linguistic categories like markedness, phoneme, subject, agent, etc. because he believes that language has a rich category structure and the study of linguistic categorization should be one of the prime sources of evidence for the nature of category structure in general. He (Lakoff 1987:67) found that linguistic categories, like conceptual categories, show prototype effects. And these effects occur at every level of language, from phonology to morphology to syntax to the lexicon. Thus, he concludes that the existence of such effects is prime facie evidence that linguistic categories have the same character as other conceptual categories. Langacker (1987a) extends this model to some well-known linguistic dichotomies. Using Rosch's theory, the classes which have been established as different in character and separately describable are considered as grading into one another according to different parameters. They actually form a continuous spectrum. The division of these spectra into different classes is in fact artificial.

The prototype theory has been widely used by cognitive linguists. In a study, Hopper and Thompson (1984) apply the prototype theory in accounting for lexical categories such as Noun, Verb and Adjective. They show that nouns are the lexicalization of the prototypical discourse functions of
discourse-manipulable participant, while verbs are the lexicalization of the prototypical functions of reported event. Accordingly, they are universal and basic. Thus, they (Hopper and Thompson 1984:707) declare that human categorization is not arbitrary, but proceeds from central to peripheral instances of categories. Consequently, they find that the grammar of languages tend to label the categories N and V with morpho-syntactic markers if they perform prototypical discourse functions.

In the present study, the notion of prototypicality will be applied to many aspects of our description of the conceptual structure of processes and participants where the boundary problems emerge.

2.2.2 Linguistic Structure as Gestalt

Gestalt psychology was first introduced by the German psychologist Max Wertheimer, who carried out a set of studies on apparent motion, viz. the perceptual experience of movement which arises when a set of lights or forms appears one right after another. He found something that could not be explained by the common psychological hypothesis that the perception of movement was due to eye-movements; that is, movement was perceived even if the interval was too brief to permit a movement and even if the subject maintained a rigid fixation. He argued that perception of movement is not a sum or an association of different elementary sensations, but rather it was apprehended directly. Wertheimer attributed perceptual
experiences like apparent motion to the way in which the brain organizes perceptual input. Consequently, he believed that a sort of short-circuit occurs in the 'psychological fields' of the brain. Thus, there is no need to posit a construction from single elements since the patterns of excitation in the brain ensure that movement can be perceived directly (cf. Gardner 1985).

Wertheimer and his colleagues proposed a set of laws to explain how perception is organized: the law of proximity, the law of symmetry, and the law of good continuation. For example, the law of proximity stipulates that objects that are close together tend to be grouped together. Basically, the theory of Gestalt psychologists is opposed to atomistic, bottom-up, or purely molecular analysis, for they advocated that perception is organized in such a way that the perception of parts is determined by the configuration of the whole, rather than vice versa (cf. Gardner 1985). Obviously, their approach is largely top-down, hence referred to as 'view from above' by Gardner (1985:111).

Their approach was adopted and extended by linguists like George Lakoff. Gestalts are, according to Lakoff (1977), structures that are used in processing. They are at once holistic and analyzable. They are composed of parts, but the wholes are not reduced to parts. The wholes have additional properties by virtue of being wholes, and the parts may take on additional significance by means of being within those
wholes. They can be analyzed into parts in more than one way, depending on the point of view of the analyzer. Therefore, linguistic units are highly integrated structural complexes which are more than just the sum of their recognizable parts. According to Lakoff (1977:247), 'gestalt', as he uses it, is in some way related to the concept used by those gestalt psychologists, but differs in some other ways. For example, Wertheimer sees Gestalt as brain structures for perceptual input from visual or auditory movement (cf. Gardner 1985). In contrast, Lakoff (1977:246) extends it to mean the structures in terms of which thought, perception, the emotions, cognitive processing, motor activity and language are organized. In particular, linguistic gestalts, for him, will involve a number of types of properties: grammatical, pragmatic, semantic, phonological, functional, etc.

Lakoff (1977:284) notes that the theory of linguistic gestalts is intended to fit into a processing theory in such a way that gestalts can directly guide both production and understanding. He, therefore, hopes that by providing some principles, they can not only yield linguistic analysis, but also play a direct role in linguistic processing and ultimately generalize to perceptual gestalts, sensori-motor gestalts and principles of reasoning. What he stresses here is that gestalts are universal in human experience.

The term 'gestalt' has not been widely spread in cognitive science for some reason. It has, however, been
paralleled by some similar notions from other disciplines like psychology and artificial intelligence. They may not mean exactly the same thing, but they work on similar principles, viz. they are to some extent top-down structures for cognitive processing. For example, Schank's (1972) 'script' denotes a sequence of processes often encountered in certain settings like a meal at a restaurant or a visit to a doctor's office. Scripts are built-in as part of a prior knowledge base. When cognitive processing is going on, they can be brought to bear on a particular text in an effort to comprehend how that text resembles, but also how it differs from, other instances of its genre (cf. Gardner 1985:165). In this connection, 'script' is in some respect similar to Lakoff's 'gestalt' for partial matching. Thus, the script allows one to make sense of different meals, ranging from a snack at McDonald's to banquet at Maxim's, or a series of visits to different medical specialists. These structural frameworks permit the 'understander' to deal expeditiously with a variety of otherwise difficult-to-assimilate texts.

In a similar way, Marvin Minsky (1975) advances his theory of frame. According to him, a frame is an expected structure of knowledge about a domain that consists of a core and a set of slots. Each slot corresponds to some aspect of the domain being modeled by the frame (Gardner 1985:166). Frames are stored in memory in the form of data structures, representing stereotyped situations (Brown and Yule 1983:238).
When one encounters a new situation (or makes a substantial change in one's view of the present problem), one selects from memory a frame and adapts it to fit reality by changing details as necessary (Minsky 1975). Frames can be used to represent different types of knowledge. For example, there can be a frame for a room or for a noun phrase in discourse. Both frames have obligatory elements (e.g. wall/nominal or pronominal) an optional elements (e.g. decorations on the walls/a numerical determiner). The basic structure of a frame contains labelled slots that can be filled by expressions including other frames. In this fashion, there will be slots labelled 'kitchen', 'bathroom', etc. in a frame of a typical house. A particular house is an instance of the house frame and can be represented by filling the slots with particular features of that individual house (Brown and Yule 1983:239). Thus, a frame is essentially a fixed representation of knowledge about the world.

People in psychology prefer to use the term 'schemata'. It was first introduced by Bartlett to indicate the mental representation which is built by our memory by combining the information in discourse and the knowledge from past experience related to the discourse. According to Bartlett, past experience is not an accumulation of individuated events and experiences, but organized. Schemata are what give the organized mass structure (Brown and Yule 1983:249). Schemata were used later by Rumelhart and Ortony (1977:107) to describe
stereotypes of concepts. A schema for FACE has, as they argue, subschemata for EYE, MOUTH, etc. which are similar to the slot and filler features of a frame. They propose the term 'schemata' for linguistic knowledge that resembles the language frames of Minsky (1975). For example, GIVE has three variables: a giver, a gift and a recipient, which is in a measure analogous to the case frame by Fillmore (1968).

Langacker (1989d:130) employs the term 'schema' to designate a grammatical pattern which can be regarded as a template for the construction of instantiating expressions. Thus, the schema captures the pertinent generalization, and its categorization of instantiating expressions constitutes their structural description (Langacker 1989d:130). In fact, the pattern itself can only be learned through the observation of instantiating expressions.

Despite their difference of terminology, all the theories stress that there are integrative structures in knowledge which cannot be regarded as the accumulation of individual elements. They serve as structured repositories for conventional knowledge, whether linguistic or otherwise.

In this study, the term 'conceptual frame' will be utilized to refer to the pattern of combinations between processes and participants in Chinese. It is assumed that conceptual frames are just one type of linguistic gestalts which constitute part of the knowledge of Chinese users in linguistic processing. These frames exist in the conceptual
structure of the mind of the speakers and can be represented by the formulaic notation as entries in the conceptual dictionary of Chinese. Using the analogy of networks, they can be said to be the connections between the notions of processes and the notions of participants.

2.2.3 A Linguistic System Consists Not of Rules But of Signs

Linguists are familiar with Saussure's notion that a language is a system of signs. But why does cognitive linguistics emphasizes this idea? The reason is that, as Lamb (1987) puts it, little or no use of the concept of the sign has been shown in the works of linguists although many of them have claimed to follow Saussure. Looking at what they have actually been doing, we find that most of the attention was given to the structures, that is to the 'system', not to the 'signs' (Lamb 1987:53). Particularly in the past 30 years, most linguists have concentrated their attention on syntax, which has been viewed as consisting of rules rather than signs. With a further step, they believe that the whole linguistic system is made up of rules rather than signs (Lamb 1987:54). To divert the torrent, cognitive linguistics emphasizes the symbolic nature of the linguistic system and takes as its goal to describe the relationship between the content and the expression.

From the symbolic nature of language follows the centrality of meaning to all the issues about which linguists concern themselves. Langacker (1987a:12) and Halliday (1975)
note that meaning is what language is all about. The ignoring of this point and focusing solely on matters of form would severely impoverish the natural and necessary subject matter of the discipline and ultimately distorts the character of the phenomena described (cf. Langacker 1987a:12). Langacker disagrees with the idea of positing a semantic component while treating grammar as an autonomous entity, for grammar itself is inherently symbolic and hence meaningful. This view commits one to look at grammar as the structuring and symbolization of semantic content.

The centrality of meaning also entails that syntax plays a relatively small role in communication. To Lamb (1987:54), a more objective view on syntactic rules and morphological rules seems to suggest that they are not actually at the heart of language at all, but are in fact relatively unimportant parts of the whole. It follows from his view that lexicon plays a much more important role than linguists used to think, for most of what goes on in communication is going on by virtue of lexicon (Lamb 1987:54). He shows that a foreigner who does not know much about syntax but who knows English vocabulary within a limited semantic sphere such as of a restaurant can make himself pretty well understood. He adds that in terms of quantity in the typical individual speaker’s linguistic system, the bulk of the information is lexical and semantic, while only a very small part is syntactic.
The importance of lexicon in cognitive linguistics runs directly counter to generative linguistics, which treats lexicon as a trashcan. Anything they find irregular or unexplainable by their theory is thrown into lexicon. On the other hand, cognitive linguistics treats lexicon as an integral part of linguistic investigation. In fact, the tenet of cognitive linguistics is that every word to some extent has its own grammar.

The symbolic view of language asserts that linguistic forms are associated with certain content. The issue is two-fold. For one thing, the relation between the content and the expression is one of arbitrariness. But this classic conception of Saussure's should not be overstated. Although the arbitrary principle can be applied of the morphemes of a language, it is much restricted in other areas. In recent years, there have been studies which show that even for morphemes the arbitrary nature is not so great as people think. For instance, Kenneth Gregerson has shown that sound symbolism abounds in languages like Rengao. Langacker (1987a) observes that an obvious phenomenon, which people rarely pay attention to, is that polymorphemic linguistic signs, which constitute the vast majority of expressions, are nonarbitrary to the extent that they are analyzable and motivated. For another thing, the nonarbitrariness is even more obvious in grammar. So Langacker (1987a) concludes that his conception of language as symbolic in nature extends beyond lexicon to
grammar. According to him, morphological and syntactic structures themselves are inherently symbolic, above and beyond the symbolic relations embodied in the lexical items they employ. Lamb (1987:59) expresses the same view. He sees syntax as, instead of a list of rules, a collection of individual syntactic constructions, each of which is concerned, on the one hand, with a particular syntactic property or specific combination, and on the other hand, with a meaning (Lamb 1987:59).

In this study, the notion of the centrality of meaning will be followed. We will show that the lexicon plays an important role in so much as all the knowledge which the speakers have can be organized therein. This includes the categories and hierarchies of processes and participants and the relationships between or among them. Thus, semantic information will be provided to the maximum. Moreover, we will show that phenomena like word order and prepositions which are usually considered syntactic in nature can be treated as information stored in the lexicon since every word has its own grammar.

2.2.4 The Structure of Linguistic Knowledge as Networks

In 2.1, it is argued that the goal of cognitive linguistics is to model the knowledge which makes linguistic processes possible. This naturally leads to the question of how linguistic knowledge is structured, organized, stored and accessed. Generally speaking, there are two different
approaches in cognitive science in terms of knowledge representation: the connectionist and the symbolic (Simon and Kaplan 1989; Lamb 1990). The elements of connectionist systems may be conceptualized as highly simplified and schematized neurons or small groups of neurons. Of course, not all practitioners regard them as neurons. In connectionist systems, the operator (relationship) modifies the network, particularly the strength of the connections between elements (Simon and Kaplan 1989:8). Thus, all the knowledge lies in the connections (Rumelhart 1989:135). On the other hand, the symbolic approach stresses that knowledge is the symbols held in memories. The symbols are stored in associative structures. Even though some models adopt a network as the form of memories, the elements of the network are still interpreted as symbols (cf. Simon and Kaplan 1989).

The version of cognitive linguistics used in this dissertation shares the connectionist view since linguistic evidence shows that the linguistic system is purely relational (Lamb 1966; 1991a). That is, it does not contain any objects but only relationships. The knowledge of a network lies in the connections rather than symbols (cf. Rumelhart 1990; Lamb 1991a). Langacker (1988d) endorses the connectionist approach and network model, for he finds that relationships hold between linguistic structures. Thus, he calls for a working hypothesis that is basically compatible with a 'connectionist'
or 'interactive-activation' model of cognitive processing (1988d:152).

The connectionist approach has been said to be better than other approaches. Rumelhart (1989) shows that a 'neurally inspired' model, i.e. the connectionist approach, has some advantages over the symbolic approach. For example, the connectionist approach can provide good solutions to problems of cognitive models: constraint-satisfaction problems, implementing content-addressable memory-storage systems, and implementing best match, in addition to its capability of exploiting parallelism in computation and mimicking brain-style computation (Rumelhart 1989:142).

In this study, we are committed to the connectionist approach, in particular the version as presented in Lamb (1991a). Following him, we believe that a linguistic system is multi-layered, i.e. it contains at least three levels: the phonological system (plus graphemic for written language), the lexical system and the conceptual system (Lamb 1991a). Each of the systems has levels within it. A linguistic system is at the same time a network which contains nections as its components. Accordingly, the units at each system occupy a position in the network. These are referred to as phonemic nections, lexical nections and conceptual nections, which are manifested by phoneme, lexeme and concept, respectively. The nections at a lower level are connected with the nections at a higher level. Thus, the lexical nections are connected with
conceptual nections. Consequently, they are meaningful linguistic units. The lexical system contains several levels: word, phrase, clause, etc. Nections of the different levels in the same system are interconnected.

The purpose of the present thesis is to study the conceptual system of processes, participants and their relationships in Chinese. According to Lamb (1991a:109), the conceptual system of a language includes at least the following types of information:

(1) Procedures (e.g. the dinner) and subprocedures.
(2) Social groups.
(3) Taxonomies of things and processes.
(4) Relationships to other conceptual properties, e.g.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>horse</td>
<td>stallion</td>
</tr>
<tr>
<td>sheep</td>
<td>ram</td>
</tr>
<tr>
<td>chicken</td>
<td>rooster</td>
</tr>
</tbody>
</table>

(5) relationships of processes to events and their participants.

(6) Relationships between parts and wholes.

(7) Locational, temporal, and other relationships.

In this study, we will concentrate on (2), (3), (5), (6) and (7). Since we are mainly concerned with the conceptual structure, we focus on the concepts of processes and participants, while treating verbs and nouns as lexical realizations of conceptual processes and participants. Thus, a lexical verb can be the realization of more than one conceptual process or a conceptual process can be realized by
more than one lexical verb. Conceptual frames will be used to represent these connections between processes and participants.

3.2.5 Dynamics and Analogy in Linguistic Knowledge

The knowledge of the users of a language is not perfect. It is constantly augmented and modified. The process will not stop until one dies. As Lamb (1991a:177) puts it, a cognitive model, therefore, should be dynamic not only in having the ability to perform comprehension and production, but also in being able to adapt to new information. In particular, a cognitive model should be able to learn a new language and to enrich its knowledge of a language already known to some extent. To allow the model to have this ability, the system should have the ability to alter the structure of the network (Lamb 1991a:177; Rumelhart 1989). For example, the model can have such ability if it is allowed to perform not only activation moving through the network from node to node, with little or no lasting change to the network itself; but also various operations which alter the form of the network, including the building of connections to block old information found to be erroneous (Lamb 1991a:177). Rumelhart (1989:140) holds a similar view in saying that changing the processing or knowledge structure in a connectionist system involves modifying the patterns of interconnectivity: 1) development of new connections; 2) loss of existing connections; 3) modifications of strengths of connections that already exist.
Analogy is also one of the principles that govern the learning process. For example, in accounting for the phenomenon of syntax, Lamb asserts that people interpret and form new combinations on the basis of analogy with previously learned ones (Lamb 1991a:115). In other words, the learner tries to find the similarity or patterns that exist between or among things and use the existent ones as exemplars. Hockett (1968) applies analogy to accounting for linguistic creativity as proposed by Chomsky (1957). According to him, people's ability to produce an indefinite number of novel sentences out of a limited number of morphemes or words is based on the function of analogy. For example, Hockett alluded to a scenario in which a child was stifled by the heat would say something like *it's three hot* based on the sentence *it's too hot* which he had heard before. Therefore, analogy works on the basis of substitution and similarity (Lamb 1991a).

As a cognitive model of Chinese speakers' knowledge of processes and participants, this study takes dynamics and analogy in linguistic knowledge into account. First, our system allows the flexibility of adding new information about processes and participants by altering the specification of conceptual features, e.g. adding subcategories or supercategories to a process or participant (See Chapter 5 for details), in their entries with formulaic notation which are analogous to notions in the network. In addition, our system will represent Chinese speakers' knowledge of the similarity
between the conceptual frames of different processes, that is, if the participants presupposed by a process are similar in categories to another, the similarity will be noted instead of writing a new conceptual frame.

2.2.6 Redundancy in Linguistic Information

Langacker (1988d:129) points out that it is psychologically plausible to suppose that speakers represent their linguistic structures in different ways, with considerable redundancy built in. Thus, it is also reasonable to assume that many structures are learned as established units even when they also follow from general principles --- the computability of a structure does not in principle preclude its learnability and inclusion as a distinct element in the cognitive representation of the linguistic system (1988d:130). Langacker's claim here is a refutation of the tenet of generative grammar which asserts that redundancy should be avoided in the grammar since the grammar of a language is construed as a self-contained algorithmic device, made up mainly of rules for generating well-formed expressions. Moreover, generative grammarians believe that a grammar should contain the fewest possible statements. Thus, any expression that can be constructed by the rules must be omitted. To do otherwise constitutes redundancy (cf. Langacker 1988d). For example, in English there are a set of plural forms of nouns such as *dogs*, *trees*, *toes*, *pins*, *bells*, and *eyes*. According to generative grammar, a regular rule for
plurals can be formulated in English grammar. If any of the forms is listed in the grammar, redundancy will result. Langacker (1988d), however, contends that a typical speaker uses frequently-occurring expressions like these on countless occasions. Accordingly, some of them must have attained the status of units.³ He (Langacker 1988d:130) suggest that the pattern itself, in fact, can only be learned through the observation of instantiating expressions, some of which most likely become units before the pattern is extracted. In his view, therefore, the grammar of a language is a structured inventory of conventional linguistic units, including specific expressions which have the status of units and schemas which are extracted to represent the commonality observed in specific expressions (both units and non-units) (cf. Langacker 1988d). Thus, he (1988d:131) considers generative grammar's refusal to include regular expressions in a grammar for mere generalization's sake the 'rule/list fallacy' since it tacitly presupposes only two options: rules vs. lists. Nevertheless, nothing in principle prevents the third option, i.e. both rules and lists (See also Lamb 1991a:106,108).

Langacker (1988d:131) proposes a 'maximalist', 'non-reductive' and 'bottom-up' approach while treating cognitive grammar as a 'usage-based' model of language structure. It is advanced as a rebuttal to the minimalist, reductive and top-down approach of generative grammar which is labeled as having dubious validity. According to him (1988d:131), the
maximalist conception views the linguistic system as a massive, highly redundant inventory of conventional units. The non-reductive approach commits one to recognizing both rules and patterns and the individual knowledge of specific structures that conform to them. As a result, a schema and its instantiations are both included in the grammar of a language if they have the status of units. Furthermore, the 'bottom-up' method also stresses the arrays of conventional instantiations rather than the rules and principles themselves exclusively.

Lakoff (1987) states that we use cognitive models to understand the world. Ordinary people without any technical expertise have theories about every important aspect of their lives which are referred to as folk models or folk theories. On the other hand, we have technical understanding which is built upon our folk theories, especially in such fundamental areas as categorization, reference, meaning, etc. For example, we have both folk and expert theories of medicine, politics, economics, etc. A given individual may hold one or more folk theories and one or more expert theories in areas like medicine, economics or physics. These cognitive models are commonly inconsistent with one another. However, they are all present in the conceptual system on which ordinary English is based. Accordingly, the grammar is such that each can be used precisely, correctly and effectively in the appropriate situations (cf. Lakoff 1987).
In a similar vein, Lamb (1991a) attacks several types of erroneous thinking in linguistic pursuits. First, he points out that one often confronts the binary thinking which does not allow degrees of difference but recognizes only two values, just black and white, with no shades of gray, e.g. 'yes' or 'no', 'all' or 'nothing', 'true' or 'false', or 'either-or'. In fact, situations in the real world may warrant a 'both' reply to these questions. For example, a person may be both conservative and liberal to some extent. Moreover, it might well be the case that a person is both economically conservative and politically liberal (cf. Lamb 1991a). Subsequently, Lamb (1991a) criticizes the single property thinking for its failure to recognize the fact that things of the world have generally indefinite properties. So it is fallacious to assume that things have a single cause, or a single purpose, or a single category. Associated with this illusion is the single analysis fallacy. For example, there has been debate on whether the word hamburger should morphologically analyzed as hamburg-er or ham-burger. As a matter of fact, some speakers may analyze it one way; others may analyze it the other way. In terms of the information the speakers have in linguistic processing, it is most likely that the speakers of English have both analyses in their mind (cf. Lamb 1991a).

In this study, redundancy is allowed in representing the knowledge of Chinese speakers. It is considered cognitively
realistic rather than something to be avoided. In order to
describe the information system for linguistic processing in
Chinese, knowledge of processes, participants and their
relationships are incorporated as much as possible, i.e. to
the maximum when necessary. Specifically, our system will
allow multiple analyses as shown above and in some cases
different categorizations of the same processes and
participants.
2.3 Some Practical Considerations
2.3.1 Notational Systems

According to Lamb (1991a), the convention of the network
is up-and-down, downward is toward expression, and upward is
toward meaning or function. Moreover, there are two major
types of nodes: AND and OR. The problem with the graphic
notation is that when linguistic structure is complex, the
notation becomes less readable for human beings since there
are too many lines and nodes intertwining.

The alternative is to use the formulaic notation which
represents the networks of linguistic knowledge in the form of
lexical entries. For example, the concept of 'hit' is written
with the capital letters HIT, while its lexical counterpart is
written with small letters hit. The connection between the
concept HIT and its lexical realization can be represented by
putting the concept over the lexical item, i.e. the upward is
toward meaning or function, while the downward is toward
expression:
HIT
EL: hit⁴

In this study, the formulaic notion will be adopted. Moreover, the relationships between processes and participants, i.e. the connections, can be represented by putting the participants beside the process with the symbol '<>'. Thus, it constitutes a conceptual frame:

HIT <Agent: HUMAN: X Patient: CONCRETE: Y>
R(X) hit R(Y)⁵

In addition, the categories and hierarchies of processes and participants are more easily represented by listing them under the entries. In other words, this can be done by specifying the supercategories and subcategories of the entries at the same time:

TABLE
SUP: FURNITURE⁶
SUB: DINNER TABLE, WRITING DESK, ...
EL: table

2.3.2 The Dictionary

As argued in 2.2.4, the lexicon of a language plays an important role and the bulk of linguistic information is in the lexicon. Moreover, each word to some extent has its own syntax. As a cognitive model of the knowledge of Chinese speakers, this study stresses on the importance of the lexicon. In fact, we will show the knowledge that Chinese speakers need in producing and comprehending Chinese texts can be all presented in the form of a conceptual dictionary that is analogous to an ordinary dictionary of words in the language. In addition, we will show that each conceptual
process to some extent has its own syntax of combining with participants, as illustrated by their conceptual frames. Although our emphasis is on the conceptual structure of processes, participants and their relationships, not the lexical items, it has been shown in the previous section that all these types of information can be written in the form of entries analogous to lexical entries of a dictionary. This is the reason why our representation of the knowledge is referred to as the conceptual dictionary of Chinese.

The conceptual dictionary presented here contains three parts: the conceptual structure of participants, the conceptual structures of processes and the conceptual structure of prepositions. The first part presents the basic categories of participants in Chinese. The second part provides information for about 300 Chinese verbs, i.e. the realizations of conceptual processes and their conceptual frames. The last part describes the functions of Chinese prepositions in relating peripheral participants to the processes.

2.4 Summary

In sum, our study adopts a cognitive approach which emphasizes the modeling of the knowledge of the users when they produce and understand linguistic output. Viewing the linguistic knowledge as part of human cognition, the main goal of our study is to investigate the conceptual structure of processes and participants which is believed to have the same
type of structure as other aspects of human cognition. Based on what the speakers know and how they actually use Chinese, our model is therefore knowledge-based and user-based. In addition, our study will apply the notion of prototypicality in dealing with categories. Using the formulaic notation, the categories and hierarchies of processes and participants, and their relationships are described in the form of lexical entries which in fact stand for the assemblies of lines and nodes of the networks. Furthermore, our system allows redundancy and flexibility. All the information needed will be provided in the form of a dictionary.
Notes to Chapter 2

1. Gardner (1985) does not elaborate on what is the established truth.

2. See Lakoff (1987) for details.

3. 'unit' is defined by Langacker (1988d) as 'familiar, thoroughly mastered structures, -- cognitive routines', e.g. dogs, trees, and toes can be learned as units.

4. EL stands for 'English lexeme'.

5. R(X) stands for 'the realization of X'.

6. SUP and SUB means supercategory and subcategory, respectively.
Chapter 3

REVIEW OF PREVIOUS STUDIES

The purpose of this chapter is to give a historical survey of different approaches to issues concerning participants and processes and some particular studies on Chinese which are pertinent to the topic of this thesis. Accordingly, the major arguments of each theoretical framework will be outlined for comparison. In addition, the solutions of some specific studies on participants and processes will be evaluated in order to obtain a basis for our undertakings. Therefore, the focus of attention will be given to those aspects which bear theoretical significance for the present treatment.

3.1 Different Approaches

3.1.1 Generative Grammar

The development of the theory on the semantic relations between verbs and nouns\(^1\) in generative grammar can be divided into several stages. Chomsky (1957) believes that syntax can be talked about independently of semantics, hence \textcolor{red}{\text{colorless green ideas sleep furiously}} is syntactically correct though semantically anomalous. Later, he (1965:75) introduced a semantic component into his system though maintaining that it is purely interpretive. To exclude semantic anomalies, two types of devices are adopted: subcategorization and selectional restrictions. The function of subcategorization is to specify the syntactic category and the contextual
feature of the lexical item in the lexicon, e.g. eat, [+V + ___ NP] (cf. Chomsky 1965:94). Selectional restrictions specify the selectional feature of the verb and the nouns immediately preceding or immediately following the verb (cf. Chomsky 1965:113). Thus, the verb frighten would have the specification [+V [+Abstract]-Subject +[+Animate]-Object], which means it takes an abstract noun as the subject and an animate noun as the object.

Some time later, Gruber (1976) developed a theory of lexical relations which is considered the 'prelexical categorial structure' (1976:2). Gruber states that his proposal constitutes a 'derivational semantic theory rather than an interpretive one' and that the 'prelexical structure' is deeper than the level of deep structure in syntax (cf. Gruber 1976, Cook 1989). Accordingly, it provides a base for the syntactic structure and at the same time the meaning relations between the parts of a sentence. Therefore, he is mainly concerned with the syntactic patterns in sentence structure which are deeper than the level of deep structure and which also give an indication of the semantic structure (Cook 1989:121). The prelexical structure has the verb as the central element. Other elements like noun phrases and prepositional phrases are labeled with case-like symbols associated with particular verbs (cf. Cook 1989). Thus, the relationships in a sentence are expressed in terms of the central verb and a series of nouns with case-like labels. The
central case role is the Theme which is considered obligatory in every sentence. In addition, there are Location, Agent, Source and Goal. Gruber (1976) uses three sets of parameters to classify the verbs, i.e. tridimensional: 1) motional, durational, and non-descriptive (non-durational and non-motional); 2) identificational, positional, possessional; 3) the case roles. For example, non-descriptive verbs do not take durative or point of time adverbials; but if they do take durative time adverbials, they become durational verbs. Moreover, they require a Theme and a Location marked with in, at and on. From another perspective, verbs can be divided into agentive and non-agentive ones. The non-agentive verbs contain concrete locative and abstract locative verbs. The concrete locative verbs include durational verbs which are defined as a state lasting through time and requiring a Theme and Location, motional verbs which are defined as change of state or position and requiring a Theme, a Source and a Goal, and non-descriptive verbs. Gruber (1976) states that Theme is obligatory in every sentence, while Location occurs with durational and non-descriptive verbs, and Source and Goal only occur with motional verbs. On the other hand, the abstract locative verbs can have possessional and identificational domains (Cook 1989). In this case, Location, Source and Goal are extended to abstract sense, as shown below:

(1) a. John has a book.
   \[ L \ V \ Os^2 \]
   
   b. Bill kept the book.
b. Bill kept the book.
   L  V  O

c. The house is a shack.
   Os  V  L

d. The milk turned sour.
   O  V  G

Note that the Theme in the possessional domain is the possessor, while the Theme in the identificational domain is the thing being identified. Thus, the types of non-agentive verbs can be summarized as follows (Cook 1989:132)

(2) Verb types  Position  Possession  Identification

1. State  
   (Os,L) be at  belong to  be AT + noun
   contain  have  be AT + adj.

2. Duration  
   (O,L) remain AT  hold  remain + noun
   stay  keep  remain + adj.

3. Motion  
   (O,S,G) come  receive  become
   go  send  turn

In addition, every verb can also be an agentive which consists of two types: Causative and Permissive. Thus, all the three dimensions have three parameters (Cook 1989):

(3) V  -->  Nonagentive  State  +  Positional
    P Agentive  +  Durational + Possessional
    C Agentive  Motional  +  Identification

Gruber defines Agent as the intender of the action; the C Agent as the cause of the event; P Agent as a willful entity which permits the act, as shown below:

(4) a. John rolled the ball down the hill.
   A  V  O  S-G

b. John let Bill come into the room.
   A  V  O=Sentence
John in (4a) is a C Agent, while John in (4b) is a P Agent. Accordingly, every verb in English can be characterized by the categories given in (3). First, every verb is non-agentive, P Agentive, or C Agentive, based on whether the agent is present. Second, depending on the situation described, every verb is a state, durational, or motional. Lastly, the semantic domain of a verb is positional, possessional, or identificational (cf. Cook 1989).

Jackendoff (1972) adopts Gruber's theory of lexical relations, but refers to it as 'thematic relations' since the theory assumes that there is an obligatory Theme in every sentence (cf. Cook 1989). The difference between Gruber and Jackendoff is that the former uses the thematic relations as a generative semantic system in a level deeper than the deep structure of Chomsky (1965), while the latter treats the thematic relations as part of the interpretive component of the standard theory. Moreover, Jackendoff (1972) uses abstract predicates, which he calls functions, to describe the types of verbs in (2) (adopted from Cook 1989):

(5) BE: state  STAY: durational  GO: motional

CAUSE: C Agent  LET: P Agent

In addition, he (1976) treats the three locational modes, i.e. positional, possessional, and identificational, as semantic primitives common to all languages (cf. Cook 1989). Jackendoff's system was later adopted by Chomsky (1981) in GB
theory as the basis of the semantic component, or the logical form.

3.1.2 Case Grammar

Case grammar was put forth by Fillmore (1968) as an alternative to Chomsky's (1965) analysis of the functions of nouns in terms of grammatical categories such as S, NP, VP, etc. In Chomsky's view, notions like subject and object can be defined by their relations to those categories. For example, 'subject' can be defined as the NP which is immediately dominated by the S node, while 'object' is defined as the NP which is immediately dominated by VP.

Fillmore (1968), therefore, argues that Chomsky's treatment fails to capture the semantically relevant syntactic relations between NP's and the structures which contain them, as shown in (6), on two counts.

(6) a. The window broke.
   b. John broke the window.
   c. The hammer broke the window.

On the one hand, all the first NPs in (6) are, according to Chomsky's scheme, immediately dominated by S, hence falling under the category of 'subject'. In terms of semantic roles, however, John is the actor who performs the action of breaking, whereas the window and the hammer are not. In fact, the subject of the verb in (6) can be interpreted in three different ways semantically. According to the standard theory, the verb 'break' in (6) would require three different rules of selectional restriction, that is, 'break' as an
intransitive verb takes an inanimate subject, and as a transitive verb, 'break' takes either an animate or an inanimate subject. Thus in the lexicon, three different specifications are needed. On the other hand, the subject-object dichotomy fails to account for the fact that the semantic role of 'the window' remains the same in all three sentences and that all the verbs are semantically related and so are the nouns.

In view of the pitfalls of Chomsky (1965), the main argument of Fillmore's case grammar (1968) is that nouns that play the same role in different environments should be assigned a constant label. For example, in (6) the window is 'Objective' and John is labeled 'Agentive', and the hammer, 'Instrumental', respectively. Some of the case roles may be optional for certain verbs. For instance, in the case frame of the verb 'break' in (6), 'Agentive' and 'Instrumental' are specified as optional, thus yielding [____ Objective (Agentive) (Instrumental)]. Consequently, notions such as 'subject' or 'object' do not play a role any more in the underlying structures, but surface only in structure relations.

Fillmore goes on to claim that the basic structure of sentences includes only two types of constituent: proposition and modality, namely, S --> M + P (1968:23). The Modality constituent embraces negation, tense, mood and aspect, while Proposition is made up of a verb and one or more categories.
Proposition may be expanded into a list of formulas: P → V + C1 + C2 ... Cn, where at least one case category must be chosen and where no case category appears more than once. P can be represented by any of a set of formulas including V + A, V + O + A, V + D, V + O + I + A, etc.

Fillmore thus believes that case categories are universal and innate (1968:24). To judge the events that are going around them, human beings need the following cases:

Agentive, Instrumental, Dative, Factive, Locative, Objective

He later on adds three other cases: Essive, Comitative, and Benefactive. He notes that none of these cases can be matched by surface-structure relations, subject and object, in any particular language (1968:25).

Fillmore claims that verbs are selected according to the case environments which the sentence provides; this he refers to as the 'case frame' (1968:26). Thus, the insertion of verbs depends on the 'case frame'. For example, the verb 'run' may be inserted into the frame [____ A], whereas verbs like 'remove' and 'murder' should be inserted into [____ O + A] and [____ D + A], respectively. Since a verb may occur in different frames, a set of case frames will be given as frame features that have the effect of imposing a classification of the verbs of the language. This is usually done by parenthesizing the optional case.
On the other hand, the features of nouns required by a particular case are specified by obligatory rules. For example, a rule which specifies that any N in an A or D must contain the semantic feature [+animate] is N ---> [+animate]/[X ____ Y]. In addition, a rule is needed to associate with each noun a label identifying the case relation it holds with the rest of the sentence. For example, every noun under L is associated with the feature [+locative], or 'idea' with [-locative] since it cannot be the head of an L expression.

Now let us look at the definitions of the major cases proposed by Fillmore (1968) and how they are present in sentences. First, observe:

(7) a. He (A) made the table (F).
   b. John (A) opened the door (O).
   c. The key (I) opened the door (O).
   d. John (A) opened the door (O) with the key (I).
   e. John (A) used the key (I) to open the door (O).
   f. John (D) believed that he would win.
   g. We (A) persuaded John (D) that he would win.
   h. It was apparent to John (D) that he would win.
   i. Chicago (L) is windy.
   j. It is windy in Chicago (L).
   k. The door (O) was opened by John (A).
   l. A house (F) was built by John (A).

According to Fillmore (1968:24-25), Agentive is the case of the typically animate perceived instigator of the action identified by the verb, as in a., b., d., e., g., k. and l.; Instrument is the case of inanimate force or object causally involved in the action or state identified by the verb, as in c., d. and e.; Dative is the case of the animate being affected by the state or action identified by the verb, as in f., g. and h.; Factitive is the object or being resulting from
the action or state identified by the verb, or understood as part of the meaning of the verb, as in a. and l.; Locative is the case which identifies the location or spatial orientation of the state or action identified by the verb, as in i. and j.; Objective is the semantically most neutral case, of which anything representable by a noun whose role in the action or state is identified by the semantic interpretation of the verb itself is affected by the action or state identified by the verb, as in b., c., e. and k.

Fillmore stresses two important points (1968). First, more cases than the above-mentioned are needed. For example, he, later in the paper, adds the Benefactive, the Comitative and the Essive, as shown in sentences (8a), (8b) and (8c), respectively:

(8) a. John bought a gift for Mary (B).
   b. John went the movie with Mary (Comitative).
   c. John is a student (Essive).

Second, none of the cases established can be interpreted as matched by the surface structure relations, such as subject and object, in any particular language, e.g. the door in (7b) and (7k) are subject or object in surface structure, but both in the Objective case.

Fillmore (1968:32) asserts that case frames, that is, a V plus a number of NP's holding special labeled relations to the sentence, is just part of the deep structure. The deep structure of a sentence can be converted into surface
structure in a variety of ways. For example, two deep cases may be represented in the same way in the surface structure, as when D and O direct objects are represented with the 'accusative' case in many languages. Moreover, A and D may be represented by the same overt form, where the determining factor may be case-linked animateness. On the other hand, all the case categories can be rewritten as $K + NP$, where $K$ is Kasus which is realized by prepositions, postpositions and case affixes. In English, $K$ is sometimes realized by prepositions, thus Pre + NP. For example, the English A preposition is by; the I preposition is by if no A; otherwise it is with; the O and F prepositions are typically zero; etc.

3.1.3 Valency Theory

Valency theory was originated by Tesniere in _Eléments de syntaxe structurale_ (1959). It was later expanded and formalized in Allerton (1978; 1982). The main idea of this theory is that the existence of verb is universal across the world's languages. According to Allerton (1982:1), a verb is needed as an essential nucleus for the major type of sentence pattern in the language under examination. That is, the verb constitutes the center of the sentence. This centrality of verb is revealed by the fact that the basic structure of a sentence is determined by the kind of verb selected. To put it the other way round, verbs should be subclassified according to the types of sentences in which they occur.
Allerton argues that verbs as a class occur in a range of sentence structures and many of them are limited to occurring in one kind of sentence structure, though some may occur in more than one structure. Therefore, valency is intended as the foundation for describing the potentials that individual verbs have for occurring in a variety of sentence structures (1982:2). Thus, valency can be looked at as the capacity of a verb for combining with particular patterns of other sentence constituents, in the same way as a chemical element with a capacity to combine with other chemical elements, hence the term 'valency'.

Central to Tesniere's (1959) idea is that the verb is the item that governs the rest of the sentence and on which the rest of the sentence depends. In this connection, the verb is the pivot around which all elements turn. Tesniere groups the elements that occur with the verb into two types: 'actants' and 'circonstants'. The former represents the valency of the individual verb, while the latter may occur with any verb in any sentence. There are three subclasses of actant: 'prime actant', 'second actant' and 'tiers actant'. They roughly correspond to subject, object and indirect object, respectively. Clearly, what Tesniere means by valency is the possibility of a verb to occur with other sentence constituents and valency includes the major syntactic components.
As stated, the main task of valency study is to describe the syntactic structure in which a verb can occur and to characterize the elements that the verb requires in the sentence. But Tesniere does not talk about how this can be done. Allerton (1978; 1982), therefore, sets as his goal to specify the number of 'companion' elements required by each individual verb and what counts as a 'companion' of a verb in respect of valency and examine when adverbial phrases (part of circonstants) are relevant. In addition, Allerton (1982) intends to address the question of optionality, viz. when and how the optional element can be regarded as part of the valency of a verb. Furthermore, he wants to explore the nature of the companion elements and answer questions like 'Are all noun phrases the same?'. Unlike Tesniere (1959), who only talks about valency in pure syntactic terms, Allerton (1982) incorporates some functional notions, such as 'subject', 'head', 'modifier', etc. since he believes that they also play a role.

Allerton (1982:6) asserts that, to give a fully explicit account of the grammatical structure of sentences like (9), the functions of the elements therein must be referred to apart from the constituent structure in order to account for their difference. Although the verbs in (9) can be subclassified into 'transitive' and 'copula', the distinction still derives from the relation between the verb and its
companion noun phrase, i.e. the function of that noun phrase. In (9),

(9) a. Oliver met an expert.
    b. Oliver became an expert.

the functions of the nouns following the verbs can be described in traditional terms as an object and a predicative, respectively. Again in the following pair of sentences, which both contain a prepositional phrase, the first can be said to have an adverbial of location, while the second requires a different functional label because it can become the subject of a passive sentence:

(10) a. Oliver went to the building.
    b. *The building was gone to by (Oliver).
    c. Oliver objected to the building.
    d. The building was objected to by (Oliver).

According to Allerton (1982), the establishment of the function of an element requires the consideration of its contribution to the whole construction of which it is a part, that is, function is a part-whole relationship. The function of a constituent is also closely connected with its class. Therefore, the major factor that determines the function of a constituent is the relationship between its own class, the class of its neighbor(s) and the class of the construction of which it is a part.

Allerton (1982) first bases his division of constructions on Bloomfield's scheme, which groups them into 'endocentric' and 'exocentric'. Endocentric constructions are
further divided into 'coordinative' and 'subordinative',
yielding the following types of constructions:

**SUBORDINATIVE:**
{ head + modifier }
{ modifier + head }

**SEMI-SUBORDINATIVE:**
{ core + specifier }
{ specifier + core }

**EXOCENTRIC:**
{ base + convertor }
{ convertor + base }

**IRREDUCIBLE:**
( cornerstone1 + cornerstone2 )

**COORDINATIVE:**
{ coordinate + coordinate }

Subordinative:

1. **LEXICAL HEAD + LEXICAL MODIFIER.** English: *totally defeat, happy children*; French: *(du) vin rouge, parler lentement.*

2. **LEXICAL HEAD + GRAMMATICAL MODIFIER.** Russian: *moi brat* or *vaf brat* where *moi* and *vaf* are optional modifiers, but ones that belong to a closed list.

3. **GRAMMATICAL HEAD + GRAMMATICAL/PURE MARKER**
**b MODIFIER.** English: *'to' and 'of' in near (to)*
**Manchester and all (of) our friends** are optional markers that have no meaning.

Semi-subordinative:

1. **LEXICAL CORE + LEXICAL SPECIFIER.** English: *damage the key.*

2. **LEXICAL CORE + GRAMMATICAL SPECIFIER.** English: noun+determiner or determiner+noun, verb+auxiliary or auxiliary+verb

Exocentric:

1. **LEXICAL BASE + GRAMMATICAL CONVERTOR.** English: *on/under/near the box, before/after/throughout January.*

2. **LEXICAL BASE + PURE MARKER CONVERTOR.** English: *(I haven't seen John) for ten years, (the coastline) of Japan.*
3. **GRAMMATICAL BASE + PURE MARKER CONVERTOR.** English: *out of, in front of.*

Irreducible:

1. **LEXICAL CORNERSTONE + LEXICAL CORNERSTONE.** English: Mary *smokes;* Russian: *prijtsj'datjelj stud'jent* *(The) chair (is) (the/a) student*.  

2. **LEXICAL CORNERSTONE + GRAMMATICAL/PURE MARKE CORNERSTONE.** English: *in the fog, by candlelight, by John.*

Coordinative:

1. **LEXICAL COORDINATE (+ GRAMMATICAL/MARKER COORDINATOR) + LEXICAL COORDINATE.** English: *raspberry and cherry flavored, (John) will come but may not stay.*

2. **GRAMMATICAL COORDINATE (+ GRAMMATICAL COORDINATOR) + GRAMMATICAL COORDINATE.** English: *in or around, if and when.*

So in the case of verb valency, according to Allerton's (1982) exposition, we are dealing with structures in which a verb acts as the core with lexical specifiers in a semi-subordinative construction. In this connection, the valency structure of each verb would be a sequence of verb plus one or more other specifier elements which he (Allerton:32) refers to as 'elaborations'. Consider:

(11) a. Oliver stumbled.  
b. Oliver damaged the key.  
c. Oliver thrust the key into the lock.  
d. Oliver stayed behind the door.  
e. Oliver gave Fagin the watch.  
f. Oliver became a thief.  
g. Oliver felt rather guilty.  
h. Oliver made Fagin quite content.

It is clear that the core is consistently a verb, but what follows the verb is different in that it consists of zero,
combinations thereof. These elements are commonly called 'complement' (cf. Halliday 1967a, Matthews 1981). Allerton (1982:33), however, uses the term 'elaborator' instead, for he finds that 'complement' is too ambiguous. That is, it refers to the element that occurs after the copular verbs in traditional grammar and the embedded sentences in generative grammar.

Allerton (1982:43) notes that in order to avoid the conflict between surface subject and deep or logical subject, he would prefer to term the grammatical functions of these verb elaborators 'valency subject', 'valency object', etc. which are based on their functions in the active type of sentence. He (Allerton 1982:45) regards the active verb pattern as more basic or 'unmarked' since, firstly, the active is morphologically more simple; secondly, the active pattern corresponds in form to the pattern found in intransitive sentences; and thirdly, only the active can be used when there is a partial neutralization of active and passive in some structures, as in:

(12)  a. Oliver was difficult to catch.
b. *Oliver was difficult to be caught.

According to Allerton (1982:48) valency serves as the link between the surface structure and the semantic level of verbal processes and participants. Consequently, at the semantic-conceptual level, semantic roles like agent and patient are required; at the valency level, functions like valency subject and valency object which have an independent
valency subject and valency object which have an independent semantic basis (principal, subprincipal participants, etc.) are required; and at the surface level, what is required are the syntactic slots clustering around the surface subject, which is selected on an independent basis, the speaker's empathy (cf. Kuno 1976). Apparently, valency structure is introduced to account for the discrepancy between grammatical functions like subject and object and semantic roles such as 'agent'. In this sense, valency is a kind of underlying representation of the grammatical structures. Therefore, Allerton invokes a transformational link between valency structures and surface structures.

What counts as a verb elaborator? Allerton (1982:57) claims that they are typically participants of the verbal process or state, such as agents, patients and recipients. In addition, some prepositional verbs as in (13) require an object:

(13)  a. Oliver referred to the building.
 b. Oliver died of heart disease.
 c. Oliver paid (me) for the book.
 d. Oliver ascribes his longevity to his healthy living.

while other verbs need some type of adverbial to be acceptable:

(14)  a. Oliver lived in Manchester.
 b. Oliver behaved badly.
 c. Oliver thought about England.
Allerton, following Fillmore (1968), refers to this kind of adverbials as 'inner' and includes them into the valency structures of verbs.

Allerton (1982:94-140) divides the valency structures into many types according their potentiality to cooccur with elaborators in certain syntactic structures: ZERO-VALENT, MONOVALENT, DIVALENT, TRIVALENT and TETRAVALENT. In each valent structure, there are some different syntactic patterns except the zero-valent and the monovalent which has the following patterns:

(15) a. Valency Structure 0: o/ + V
    ;It drizzled for two hours.
b. Valency structure 1: SUBJECT + V
    ;cough, faint, graze, ...

The divalent structures differ according to the second elaborator they take:

(16) Valency Structure 12: SUBJECT + V + OBJECT
    ;carry, attack, ...
Valency Structure 13: SUBJECT + V + OBJOID
    ;equal, fit, ...
Valency Structure 14: SUBJECT + V + PREDICATIVE ;turn sour, ...
Valency Structure 15: SUBJECT + V + PREP OBJECT ;account for,
Valency Structure 16: SUBJECT + V + PREP OBJOID ;succeed in
Valency Structure 17: SUBJECT + V + ADV ELABORATOR ;sit, lie,
Valency Structure 18: SUBJECT + V + ADV LIMITER ;pull up,

Trivalent verbs take a subject two other elaborators. There are many types of trivalent structures. For illustrative purposes, only two of them are given below with examples (For details, see Allerton 1982:102):
Valency Structure 122: SUBJECT + V + (OBJECT + INDIRECT OBJECT or (INDIRECT OBJECT + OBJECT
;Oliver took Elizabeth some flowers.
;Oliver took some flowers to Elizabeth.

Valency Structure 123: SUBJECT + V + OBJECT + OBJOID
;Oliver fined me twenty pounds.

As for tetravalent structures in English, Allerton (1982) is not sure how many types exist. However, he believes that two clearly fall into this category:

Valency Structure 1282: SUBJECT + V + OBJECT + ADV LIMITER + INDIRECT OBJECT
;Oliver typed an article out for Elizabeth.

Valency Structure 1286: SUBJECT + V + OBJECT + ADV LIMITER + PREPOSITIONAL OBJOID
;Oliver carried the box out to the kitchen.

Allerton (1982:121) argues that underlying the syntactic function of an elaborator is its semantic roles. He tries to demonstrate that there are several close relationships between semantic roles and syntactic function, but also that each has a fair degree of independence. Semantic roles are diffuse and without clear boundaries, and they overlap with each other. In contrast, syntactic categories are discrete. Accordingly, Allerton (1982:121) sets out to examine the semantic range of each elaborator function, and how particular semantic roles are expressed syntactically. He finds that syntactic categories are language-specific, whereas semantic roles are presumably in principle universal (Allerton 1982:122). Consequently, the semantic roles of the elaborators are influenced both by the overall valency structure of a verb and the meaning of the verb. For instance, valency structure may
refer either to state (of affairs) or to a change of state. The latter possesses a richer structure than states since it may be either momentary, i.e. events, or extended in time, i.e. processes and involves the change of one state to another and the possibility of agency and movement. Conversely, the former presents the simplest syntactic-semantic patterns:

(19)  
a. SUBJECT:affected entity + VERB:state  
b. SUBJECT:affected entity + VERB:existence+PREDICATIVE:state

and has the following semantic roles associated with them:

(20)  
a. state,  
b. affected (=characterized) entity,  
c. "relatum" (i.e. entity brought into a relationship),  
d. location,  
e. time.  
; Oliver got better; The room was stuffy.

Thus, Allerton (1982:14) concludes that the state is expressed either by the verb, or in the case of copular verbs, in the predicative, the subject function expresses the affected entity, where there is one, but otherwise the location or time.

Moving on to events and processes, Allerton (1982:14) asserts that verbs which refer to change of state normally make reference to an affected entity that undergoes the change of state. In the case of intransitive verbs, some subjects are simultaneously performer and affected, as in bark, cough, and so on. A performer may be unaware of his activity, or he may be fully aware of it or may be aware but having no positive intent, or wilfully intending to perform. On the
separate mention to a performer and a 'patient' (i.e. an affected entity), as in Oliver hurt Charles, or two different performers, as in Oliver opened the door, or patients, as in John lost the book. So the general scheme of representing sentence like (21) is (22):

(21) Oliver punched Charles.

(22) AGENT -------- acts upon --------> AFFECTED ENTITY
    performs affects
    ACTION

In addition to the performer and affected entity (patient), there are also semantic roles like 'effected object' (result), location, time, direction (which includes origin, path or range, and destination), recipient, mental focus (or stimulus), force or instrument, initiator. Allerton goes on to claim that each individual verb makes a selection from among the universal range of semantic roles as shown above. Some of the roles can occur in the adverbial positions which are not specified in the valency structures. For example, instrument, origin and time occur in elaborator or adverbial position according to the valency of the verb the accompany, e.g. an instrument occupies the valency object function of the verb use but can only appear as an adverbial for the verb open (with the key).

The following shows some of Allerton's (1982) valency entries for English verbs, where () = indefinite deletion and [] = definite deletion:

(23) RESIDE "having of an abode"
    1. subject "performer/affected"
The following shows some of Allerton's (1982) valency entries for English verbs, where () = indefinite deletion and [] = definite deletion:

(23) RESIDE "having of an abode"
1. subject "performer/affected"
2. adverbial elaborator "location"
;Oliver resided in the palace.

DRIZZLE "floating wet precipitation", 0.
;It drizzled.

LISTEN "auditory observation and attention"
I. "auditory observation"
1. subject "performer"
2. (in-adverb limiter "over radio broadcast")
3. [to-prepositional object "mental focus"]
;Oliver listened (in) [to the concert].

II. "auditory attention"
1. subject "performer"
2. out-adverb limiter
3. (for-prepositional object "(potential) mental focus")
;Oliver listened out for the police.

3.1.4 Systemic Grammar

The issues regarding processes and participants constitute one of the major components of the theoretical framework of Systemic Grammar as developed by M. A. K. Halliday and others. In Halliday's (1985) view, a clause as a linguistic unit has three distinct kinds of organization in meaning: message, exchange and representation, the last of which functions as the means of representing the ideational meaning which enables human beings to build a mental picture of reality in order to make sense of what goes on around them and inside them. For him, processes are among the things represented by this ideational function.
Halliday (1985:101) defines the syntactic and semantic system of representing processes like doing, happening, feeling and being as the system of transitivity, which specifies the different types of process that are recognized in the language and the structures by which they are expressed. Semantically, transitivity comprises three components: the process itself, participants in the process, and circumstances associated with the process. The word 'process' here is used both as a cover term and a specific term. Of the three components, process and participants are more important since circumstances are optional in the semantic configuration of human experience. Normally, a process is realized by a verbal group, while a participant is realized by a nominal group.

In the semantics of English, the general category 'process' contains three major subtypes: material processes, mental processes and relational processes. Every material process which expresses a process of doing has an actor. And this process may be extended to some other entity which is referred to as the goal. For example, in the following sentence,

(24) The lion caught the tourist

the lion functions as the actor and the tourist serves as the goal, so the whole process which expresses that one entity has done something to some other entity is regarded as the material process.
For some other processes, the term 'material' may not be applicable since the same semantic labels cannot characterize the participants therein. For instance, the clause

(25) Mary liked that present

the participants Mary and that present, according to Halliday (1985:111), are the senser and the phenomenon, respectively. In this connection, a mental process contains the senser, who is the conscious being that is feeling, thinking or seeing, and the phenomenon, which is felt, thought, or seen. In turn, these mental processes can be further divided into three main sub-types: perception (seeing, hearing, etc.), affection (liking, fearing, etc.) and cognition (thinking, knowing, understanding, etc.).

In addition, there are also some verbal concepts which cannot be described by either of the above categories. In this case, Halliday (1985:112) suggests that the term 'relational process' may be appropriate to apply since they designate 'processes of being'. He thus expands the meaning of the term 'process' to include relational concepts, in order to have a single cover term for all the concepts which presuppose participants. As an example consider:

(26) Sarah is wise

The participant Sarah is the token and wise is the value of the process. Basically, relational processes can be grouped into three types:

(27) a. intensive 'x is a'
b. circumstantial 'x is at a'
c. possessive 'x has a'

and each type can be realized by two different modes:

(28) a. attributive 'a is an attribute of x'
    b. identifying 'a is the identity of x'

For example, the clause

(29) Peter has a piano

is a possessive and attributive process, but the same relationships can also be realized by a possessive identifying process. In this case, those of (29) will appear as in the following clause:

(30) The piano is Peter's

In addition to the three major types of process, there are also some other minor types. They each are close to one of the major types but differ in some ways. For example, behavioral processes signal physiological and psychological behavior, like smiling, coughing, etc. They function more like 'doing'. Then, there are verbal processes which represent the process of saying. They behave more like mental processes. Finally, there are existential processes which assert that something exists or happens. They are typically realized by a existential clause containing the word there:

(31) There seems to be a problem

Halliday (1985) goes on to argue that each type of process has its corresponding types of participants. For instance, a material process has an actor and a goal, while a mental process has a senser and a phenomenon as participants. For a relational process, there are token and value. At the
syntactic level, these participants are directly related to the verb without a preposition as intermediary.

On the other hand, some processes are related to some indirect participants. According to Halliday (1985:132), these participants are grammatically 'oblique'. They can be divided into two different groups: beneficiary and range. They assume different semantic roles as they appear in different types of process. For example, the beneficiary is either recipient or client in a material process, while in a verbal process, the beneficiary is the receiver, the one who is being addressed. Moreover, the range, the element that specifies the scope of the process, may also appear in material, behavioral, mental and verbal processes. Consider:

(32)  
   a. John and Mary were playing tennis  
   b. I like it  
   c. She speaks German

(32a) contains a material process in which the range becomes the domain over which the process takes place; (32b) represents a mental process in which the range becomes the phenomenon, that which 'is seen, felt or thought'; (32c) denotes a verbal process in which the range turns out to be the verbiage.

Further away from the process itself are the circumstantial elements which Halliday (1985:102) describes as optional. These elements can in turn be divided into subcategories like extent and location in time and space, manner, cause, accompaniment, etc. They can be treated
independently, without being distinguished according to process type because, although there are numerous restrictions on the way particular circumstantialss combine with other elements, these often apply only to rather small classes and in any case do not affect either the structure or the meaning. However, as he admits, the distinction between participants and circumstances is becoming increasingly blurred, and many instances will satisfy both patterns (Halliday 1985:144). For example, the following sentences all contain a direct or indirect participant at the end

(33) a. The bridge was built by the army (actor)
b. I sent a letter to my love (recipient)
c. I addressed him in fluent Russian (verbiage)

even though the participants are preceded by prepositions. This shows the difficulty in maintaining the distinction between participants and circumstances.

3.2 Some Specific Studies of Chinese

3.2.1 Chao's Account

Chao (1968) dwells at length on verb-object relations. He observes that the grammatical meaning, most frequently met with meaning, that of action and goal, as in dā bāzi (shoot a target), chī dōngxi (eat things) and fàng huǒ (set fire). There are, however, many instances where the action and goal relation is either vague or clearly reversed. For example, wǒ liū xiě le 'I'm bleeding', if liū is regarded as my action 'I let flow (blood)', it seems to be action and goal; but if liū is looked upon as 'there flows out (blood)', then xiě is actor
rather than goal (Chao 1968:308). Chao adds that a second and secondary part of the grammatical meaning of the V-O construction is that an object has indefinite reference, whereas a subject has definite reference (See Li and Thompson 1978 for a similar observation). For instance, xiě-wán xin le 'have finished writing a letter'; xin xiě-wán le 'the letter (I) have finished writing'.

According to Chao (1968:308-10), there are, semantically, several kinds of relations which exist between verb and object: a) causative: pāo mǎ 'run horses, -- cause horses to run --- do horse-racing'; b) instrumental: xiě māohūi 'write with brush-pen'; c) causing or letting something come into or out of existence: xiě zì 'write characters', shēng xiāohái 'give birth to a child'; etc. He concludes that there is practically no limit to such categories of classifying the meanings of action-goal, once we start setting them up. Furthermore, they not only overlap, but the meaning of the V-O relation varies also with what we regard as part of the verb and what as in the V-O relation. Thus, he (1968:301) summarizes that an object in Chinese is less regularly tied up with the meaning of goal of action. Moreover, he also seems to suggest that the meaning of the V-O relation for the most part depends on each individual verb used.

Apart from the meaning of the V-O relation, Chao (1968:310) also touches on the verb types and the possible types of objects each verb type can take. He claims that
transitive verbs take almost any object: hē chá 'drink tea', while some transitive verbs may take place words as objects, as dào le jiā 'arrived home'. Verbs like gěi 'give', sòng 'send', shǎng 'reward', etc. take one object or a direct and an indirect object: sòng lǐ 'send gifts'; sòng tā yì fēn lǐ 'send him a gift'. In his view, intransitive verbs and adjectives are not verbs which do not take objects, but verbs which can only take cognate objects: xiào yì xiào 'smile a smile'; cháng le sāncùn 'too long or longer by three inches'.

Cognate objects are divided into four distinctive types: a) the number of times of action: chāo le liānghuí 'quarreled twice', kàn le sānbiàn 'read three times'; b) its duration: zhù le sāntiān 'lived (there) for three years', zǒu le yì ge zhōngtòu 'have walked for an hour'; c) its extent: dà shí bèi 'bigger by ten times', kěxī màn le yíbù 'unfortunately too late by one step'; d) course or destination of locomotion: zǒu dào 'walk (one's) way', fēi Tài píngyáng 'fly the Pacific' (Chao 1968:312).

Chao (1968:312) notices another important phenomenon in Chinese in connection with transitive verbs. An object of a transitive verb is generally omitted if it has occurred in a near context, whether or not as object to the verb in question. Consider as an example the sentence in (34):

(34) Wǒ kàn-wán le báo le. nǐ yào kǎn ma? I read-finish LE newspaper LE you want read MA 'I've finished reading the newspaper, do you want to read it?'
where the object *it* is always required in the English, but
normally left out in Chinese. Furthermore, the understood
object is not even an object in the preceding context. For
example, in sentence (35),

(35) Jīn r de bào lái le. nǐ yào kàn ma?
    'Today's newspaper has come.
    Do you want to read it?'

the omitted object in the second clause refers to the subject
of the first clause.

3.2.2 Li's (1971) Account

Li Yingche's (1971) dissertation attempts to apply
Fillmore's case grammar to Chinese. As the author notes, the
purpose of his study is to test Fillmore's framework on a
language like Chinese which is has no genetic relationship to
English since Fillmore (1968) claims that 'case' is a
language universal. Moreover, Li finds case grammar useful
because it is a theory that explicitly deals with the
functional relations between noun phrases and verb phrases,
which he thinks are important in accounting for the semantic
relations between the nouns and verbs in the following
sentences:

(36) a. Jī bù chī le
    'The chickens are not eating any more
    Chickens, I'm not going to eat any more.'

b. Zhèi difangr kěyǐ yóu yōng
    'At) this place, (one) can swim
    '}(At) this place, (one) can swim.'
Superficially, the first NP's in both a. and b. are the subject, but their semantic functions are quite different: \textit{ji} can be either patient or agent, while \textit{zhēi difangr} is just a location. In Li's (1971:6) opinion, the concept of 'topic', like 'subject' and 'object', is also limited to the same level of syntax, as it is mostly used in Chinese. For one thing, there are different kinds of subject, object, and topic in terms of their functions. For another thing, not all noun phrases function as just subject or topic even on the surface. Consequently, the problems here can only be clarified and generalized by Fillmore's case theory. Accordingly, Li (1971) bases his treatment exclusively on Fillmore's framework. Since case grammar has been discussed in 2.1, it will not be elaborated here.

Li (1971) first embarks on a classification Chinese verbs. He actually adopts both Chao's (1968) and Wang's (1964) systems and blends them together. Unlike Chao (1968), who considers 'transitivity' as the main determining factor in verb classification, Li proposes to use 'action' instead. Of course, there are some other semantic criteria, such as 'status', 'perceptual', 'quality', 'quotative', etc. and some grammatical ones, like 'direct object', 'transitive' and so on. The result of Li's endeavor is the following diagram (Li 1971:13):
Li (1971:24) finds that cases are largely determinable by various classes of verbs: VA implies A in the deep structure, VTa and Vtq (and possibly others like ADJ and yǒu) predict O, Vtdeo-1 and Vtq (and possibly yǒu and Vis) imply D in the sentence, Vl (and possibly other verbs) determines I, some VA may also determine F, all verbs may occur with C, and VA may also predict B. In other words, there are some types of correspondence between verbs and cases.

Li (1971) goes on to examine the relationship of cases to coverbs and postverbs (i.e. prepositions), viz. to relate each case to its markers. Since all Chinese prepositions are derived from verbs, they can still function as verbs and have more concrete meanings than the English prepositions. Li (1971:28) divides these prepositions into six kinds:

(38) 1. ｇī 'to', ｂēi 'beī', ｊiāo 'by', ...
2. ａ) ｊiānɡ, ｑｕān, ｂ) ｂā (object marker)
3. ａ) ｗānɡ, ｘｉānɡ 'toward', ｌí 'form',
ｂ) ｃόnɡ, ｚī 'from', ｙān 'along', ...
4. ｄuī 'to', ｇēn 'with', ｈé 'with', ...
5. ｇī 'for, to'
6. ｇī, 'for', ｔī 'for', ｇī, ...
He notes that class 1 prepositions help establish A case, in addition to the class of verbs VA. That is to say, whenever there is a VA verb or a preposition in class 1, the case A can be identified. For example, in the following sentences,

(39)  
(a) Tā dǎ le Zhāngsān
     he beat LE Z.S.
     'He beat Z.S.'

(b) Zhāngsān bèi tā dǎ le
     Z.S. BEI he beat LE
     'Z.S. was beaten by him.'

The Agentive case is established by a VA verb dǎ, as in (39a), or by a preposition bèi which is in class 1, as in (39b).

In a similar way, other cases are tied to certain types of prepositions. For instance, class 2 prepositions are 0 case markers though there are some restrictions on the occurrence of some of the prepositions. For some cases, there are no prepositions as markers, e.g. Factive does not have any overt marking. Moreover, case markers can overlap, i.e. gěi serves as both the B case and 0 case marker. Some cases have more markers than others, namely, class 4 marks the C case and class 3 indicates the L case.

Having identified eight types cases (Li [1971] omitted Fillmore's [1969] Essive case) in Chinese, Li (1971) starts to establish the relationship of case to meaning. He (Li 1971:40) asserts that NP's in A, D and B cases are either intrinsically animate or metaphorically marked as animate, while NP's in O and F are neutral in terms of animateness.
Unlike Fillmore (1968) who treats I as naturally inanimate, Li believes that I is also neutral with respect to animateness, just like O and F. L has a semantic feature of space or location. In contrast, C inherits and agrees with its dominating NP's in semantic features like animateness or space.

Moreover, Li (1971:47) finds that case markers (i.e. prepositions) and verbs also correlate with certain semantic features of the nouns that follows them. For example, yòng 'with' and ná 'with' are both I-markers, but the former takes either concrete or abstract nouns, while the latter takes concrete nouns only. In the case of verbs, some take human nouns as objects, as in (38a), whereas others take abstract nouns as objects, as in (40b):

(40)  a. Wǒ quán tā qù
     'I advised him to go'

     b. Wǒ tīng le yǎnjiāng
     'I listened to the lecture.'

In the final part of his thesis, Li (1971) is concerned with the syntactic behavior of each type of case and the syntactic and semantic devices for testing them. For instance, a sentence containing an A case may normally undergo passivization, Ba-transformation, imperativization, etc. Since those aspects are not relevant to our topic, I will not go into the details.
3.2.3 Teng's (1975) Account

Teng (1975) is a study on the transitivity relations in Chinese, i.e. the relations between processes and participants. He does not explicitly use the terms 'participant' and 'process', but 'verb-noun relation', 'role', etc. instead. Although he borrowed some terms from Halliday (1967) such as 'participation', he uses them in a different sense. For example, his 'circumstance' includes categories like 'benefactive', 'instrumental' and so on, which are under 'transitivity' in Halliday's system.

The theoretical framework employed by Teng (1975) is one of a mixture, i.e. he combined Fillmore's case grammar, Halliday's systemic grammar and Chafe's grammar all together. For example, he adopts some of the terms used by Halliday (1967) to describe the semantic role of the participants, like 'range', 'goal', etc. However, he mainly follows Chafe's (1970) system of verb classification and the derivations of verbs from underlying structures. For instance, he adopts Chafe's notion of verb centrality and his scheme of grouping verbs into three categories: Action (physical or mental) which defines activities, State which defines quality and condition, and Process which defines change-of-state. According to Teng (1975:47), different categories of verbs have different configurations of relations. Thus, the patterns of relations of verbs can be represented as follows:
(41) Action:
   (i) Agt + o/  Tā zài kū.
       he ZAI cry
       'He is crying.'
   (ii) Agt + Pat: Tā zài shā ji.
        he ZAI kill chicken
        'He is killing chickens.'
   (iii) Agt + Range: Tā zài chăng gē.
        he ZAI sing song
        'He is singing.'
   (iv) Agt + Goal: Tā zài zhǎo shū.
        he ZAI look-for book
        'He is looking for books.'

State:
   (i) Pat + o/  Tā hěn gāo.
       he very tall
       'He is very tall.'
   (ii) Pat + Range:
        Zhē liàng chē zhī sān bǎi kuài qián
        this CL car worth three hundred CL money
        'This car is worth 300 dollars.'
   (iii) Pat + Goal: Tā hěn xǐhuān pǎochē.
        he very like sportscar
        'He likes sportscars.'

Process:
   (i) Pat + o/  Tā sǐ le.
       he die LE
       'He died.'
   (ii) Pat + Range: Mén pō le yīge dòng.
        door break LE one CL hole
        'The door got a hole in it.'
   (iii) Pat + Goal: Kēdōu huì biàn qīngwā.
        tadpole will become frog
        'Tadpoles will become frogs.'

Causer:
   (i) Causer + Agt:
        Nèi jiàn huài xiāoxi shī tā dà kū qīlái.
        that CL bad news cause he great cry Inc.
        'That bad news made him cry.'
   (ii) Causer + Pat: Zhāngsān shī tā hěn shēng qǐ
        Z.S. cause he very angry
        'Zhangsan made him angry.'
   (iii) Causer + Pat:
        Kāihui shī tā wàng le chī fàn.
        meeting cause he forget LE eat rice
        'Meetings made him forget to eat.'
Teng (1975) adopts Chafe's deep structure representations of verb-noun relations and states that the rest of the sentence is determined by the underlying specifications of the verb. For example, action verbs like kū 'cry' or gōngzuò 'work' may only require an agent, hence having the semantic structure below:

(42)  

\[
\begin{array}{c}
V \\
\text{action} \\
\text{agt} \\
N
\end{array}
\]

Other action verbs like zuò 'sit' and shā 'kill' may need more than agent. Thus, their semantic structures are complex:

(43)  

\[
\begin{array}{c}
a. \\
V \\
\text{action} \\
zuò \\
\text{locative} \\
\text{agt} \\
N
\end{array}
\]

b.  

\[
\begin{array}{c}
\text{process} \\
\text{action} \\
shā \\
\text{pat} \\
N \\
\text{agt} \\
N
\end{array}
\]

Verbs of other groups like Process and State can all be represented with this type of underlying semantic structure. At the first glance, they are similar to Fillmore's (1968) case frames since they both are the semantic structures posited for the verbs. However, there is an important difference: Fillmore's (1968) case frames are posited for each
individual verb and contain optional case specifications, whereas Chafe's underlying structures are designed for classes of verbs and do not allow optional participant nouns.

Having described his theoretical framework, Teng (1975) starts to examine how the semantic roles are manifested in Chinese. The major transitivity relations under his investigation are Agent, Patient, Range, Source and Goal. According to him, the role Agent can only occur with action verbs. Then, he (Teng 1975:54) argues that Agent does not have the semantic feature 'animate', but the feature 'potent', for he regards the following sentences as containing an agent:

(44) a. Fēng bā shù chuī-dāo le.
     wind BA tree blow-down LE
     'The wind blew down the tree.'

b. Dà-shuǐ bā cūnzi yān le.
     flood BA village drown LE
     'The flood drowned the village.'

Agent does not have the feature 'volitional' either:

(45) a. Tā tūn le yīgēn biézhēn.
     he swallow LE one CL safety-pin
     'He swallowed a safety-pin.'

b. Tā tù le yīkǒu xié.
     he spit LE one CL blood
     'He spat a mouthful of blood.'

The Agent in (45) is nonvolitional, but it cannot be considered Instrument.

Teng (1975:64) defines Patient as the subject of State verbs, as in (46a), the subject of Process verbs, as in (46b), and the object of Process-Action verbs, as in (46c):


(46)  a. Xīǎo Míng hěn āi tāde gēge.
X. M. very love his brother
'X. M. loves his brother very much.'

b. Gǒu sǐ le.
dog die LE
'The dog died.'

c. Tā bǎ yǐzi mài le.
he BA chair sell LE
'He sold the chair.'

Teng insists on not distinguishing Patient and Experiencer since he believes that the subject in (47a) and the one in (47b) have no significant difference:

(47)  a. Zhāngsān hěn hǎipà.
Zhangsan very afraid
'Zhangsan is very scared.'

b. Zhāngsān hěn pà Lǐ Xiǎojīě.
Zhangsan very afraid Li Miss
'Zhangsan is afraid of Miss Li.'

Teng (1975) retains Halliday's term Range which signals the extent of the scope or reference of the verbal process. Its sole function is to add 'specifications' to what is implied by the verb in question. For example, the only way to specify 'worth' is by means of money or something valuable in terms of money, to specify 'surname' by means of a name, and to specify 'damage' by means of an actual result of such a damage (Teng 1975:95).

According to Teng (1975:95), the difference between Range and Patient is that the former is "effected" while the latter is "affected" (cf. Fillmore 1968:4), as shown below:

(48)  a. Mén pò le yīge dōng.
door break LE one CL hole
'The door got a hole in it.'
b. Yīzi huài le yìtiáo tuǐ.
  chair bad LE one CL leg
  'The chair has a broken leg.'

Teng (1975) distinguishes two kinds of Goal: Transitivity Goal and Circumstantial Goal (1975:130, 145):

(49) a. tā hěn xǐhuān Lǐ Sī
  he very like L. S.
  'He likes L.S. very much.'

b. tā dui lǐshǐ yǒu xīngqù
  he to history have interest
  'He is interested in history.'

(49a) shows that a Transitivity Goal signals the object of a verb which is neither a Patient nor a Range, i.e. it is not disposed of or executed, whereas (49b) shows that a Circumstantial Goal is not the object of verb. Since Source in Teng's system does not have any special meaning, i.e. he uses it in the same way as most linguists do, it will not be discussed here.

3.2.4 Washburn's (1975) Account

Washburn (1975) is a study of the structure of simple clauses in Chinese. The theoretical framework she employs is a synthesis of three approaches, viz. tagmemic analysis as developed by Pike (1967), case grammar as presented in Fillmore (1968) and Chafian grammar as advanced in Chafe (1970). However, the basis of her expositions is still mainly tagmemic grammar. The reason for incorporating the case concepts of case grammar and the notions of semantic structure of Chafian grammar is that they provide a semantically based
model that keeps the distinction between the deep and surface structures (cf. Washburn 1975:3).

Since case grammar and Chafian grammar have already been touched upon earlier, only a brief description of tagmemic grammar is necessary here. Tagmemic grammar is a system of surface analysis of which the basic unit is tagmeme which, according to Washburn (1975), is the correlation of a function, or a slot, with the class of mutually substitutable items that fill that slot. Thus, a tagmeme is a correlative which simultaneously and explicitly names both its function (grammatical meaning) and form (Washburn 1975:9). Tagmemes form constructions which contain two or more tagmemes, or one obligatory and one optional unit. These construction are referred to as syntagmemes which are arranged in a hierarchy, from high to low, sentence, clause, phrase, word, and morpheme level. Moreover, they are defined in terms of the grammatical level where they occur and their constituent tagmemes. Thus, a transitive clause syntagmeme is characterized as having a predicate tagmeme with a transitive verb as its filler and an object tagmeme (optional), occurring at the clause level (cf. Washburn 1975). A clause in English contains one and only one predicate or predicate-like tagmeme which is in turn the only obligatory unit therein. Accordingly, there are three basic clause types in English: a) intransitive clause which has a noun phrase as its subject, an intransitive verb as its predicate; b) transitive clause which contains a noun phrase
as its subject, a transitive verb as its predicate and a noun phrase as its object; c) equational clause which possesses a noun phrase as its subject, an equational verb as its predicate and a noun phrase or an adjective or an adverb as its predicate-attribute. Syntagmemes of the lower level are the typical fillers of the functional slot of the tagmemes in the higher level (cf Washburn 1975:10).

Having brought case grammar and Chafian grammar into her tagmemic analysis, Washburn (1975) proposes several principles of her framework, e.g. semantic structures are deep structures with the verb as its center; attach deep structure case symbols to tagmemic surface structure subject and object slots; classify verbs by their case frames. In addition, Washburn's (1975) system of analyzing Chinese clauses has three parts: components of the grammar which includes surface and deep structure descriptions of a clause, realization rules and classification of verbs. Since our focus is on the semantic relations between processes and participants, primary attention will be paid to her treatment of semantic roles and verb classifications, rather than the surface syntactic and transformational components.

According to Washburn (1975) who follows Pike's system, there are three types of verbs in Chinese: intransitive, transitive and equational, which form three types of clauses with the same names. Washburn (1975) also incorporates Chafe's (1970) categorization of verbs into three basic types:
state, process and action, and some derived types: action-process, action and action-completable. Moreover, she (Washburn 1975) adopts Fillmore's (1971) case system to specify the surface noun phrases and argues that semantic cases which are directly related to, or required, by the verb are propositional cases, as shown below:

(50)  

a. OBJECT, required by the selectional features STATE, PROCESS, and COMPLETABLE.

b. AGENT, required by the selectional unit ACTION.

c. EXPERIENCER, required by the selectional feature EXPERIENTIAL.

d. BENEFICIARY, required by the selectional feature BENEFACTIVE.

e. LOCATION, required by the selectional feature LOCATIVE.

Consequently, a verb must first acquire one (a STATE or a PROCESS) or two (a combination of a PROCESS and an ACTION, or an ACTION and a COMPLETABLE) selectional units. In addition, it may acquire one and only one of three other selectional units (EXPERIENTIAL, BENEFACTIVE, or LOCATIVE). These selectional units control the occurrence of the noun cases in the sentences.

With the three systems combined, Washburn (1975) goes on to analyze the simple-complete-statement clauses in Chinese. She (Washburn 1975:67) claims that the three basic clause types in Chinese can be further categorized in accordance with the selectional units. Thus, an equational clause may contain
a BENEFACTIVE-STATE or a LOCATIVE-PROCESS verb, etc. as shown in (51):

(51) a. Gǔdŏng shūyú bái tàitai
  antique belong Mrs. Bai
  'The antique belongs to Mrs. Bai.'
  Os   B
  S:   P:    PA:
  n   lv   n

  b. Shū (bǔ) zài zhuōzi shàng le³
  book not exist table top become
  O  NEG   L
  S: Neg: P:  PA:     Asp:
  n  neg  lv  N   pc
  'The book is now on the table.'
  'The book is no longer on the table.'

According to her, (51a) has the surface structure +Sos:n +P:lv +PAb:n which reads: the affirmative BENEFACTIVE-STATE equational clause is composed of a SUBJECT slot filled by a noun with an OBJECT case, a Predicate slot filled by a BS-linking verb, and a Predicate Attribute slot filled by a noun with a BENEFICIARY case in the deep structure of the clause, while (51b) has the surface structure +So:n +Neg:bu +P:lv +PAl:N +Asp:le which reads: the equational clause containing the inchoatively derived LOCATIVE-PROCESS verb zài le are composed of a SUBJECT slot filled by an O-noun, an optional Negative slot filled by the negative word bǔ, a Predicate slot filled by the inchoatively derived LP-linking verb zài, a PA slot filled by a noun phrase with the L-case, and an Aspect slot filled by the IN-particle le. Apparently, Washburn (1975) treats nouns as inherently having deep cases and STATE verbs with the aspect marker le as one unit in the deep structure, hence constituting an independent class of STATE
verbs, while at the same time regarding le as the aspect particle. Thus, 13 types of equational clauses can be identified in Chinese in accordance with the selectional units of the verb which are made up of either STATE or PROCESS, a selectional feature (BENEFACTIVE or LOCATIVE), and a derived feature IN (inchoative, i.e. linking verb with le), LZ (locativizer, i.e. linking verb with zài), PZ (predicativizer, i.e. noun as predicate-attribute with optional shì), or NZ (nominalizer, i.e. noun phrase as predicate-attribute made of a verb or a VO and de).

In the case of intransitive clauses, there are 10 types which depend on three groups of parameters: a) a basic verb type STATE or PROCESS, or derived type ACTION-PROCESS; b) a selectional feature, i.e. BENEFACTIVE, EXPERIENTIAL, or LOCATIVE; c) derived semantic feature INS (instant, e.g. sì), DE (deactivitive, e.g. kāi as in xiāngzi kāi le 'the trunk is opened' which contains a Subject with the OBJECT role in the deep structure), or CU (causative, e.g. gū as in bái tāitai qù chèzhàn le 'Mrs. Bai went to the station'). As examples, consider the following:

\[(52)\]

\begin{align*}
a. \ & Yù \ (bù) \ piányi \\
& \text{fish not inexpensive} \\
& Os \ \text{NEG} \\
& S: \ \text{Neg: P:} \\
& n \ \text{neg sv} \\
& \text{Fish is (not) inexpensive.'} \\
\end{align*}

\begin{align*}
b. \ & Bái \ tāitai \ yǒu \ qián \\
& \text{Mrs. Bai have money} \\
& Bs \ \text{O*} \\
& S: \ \text{P:} \\
& n \ \text{sv} \\
\end{align*}
'Mrs. Báì is wealthy.'

According to Washburn (1975), (52a) is a STATE intransitive clause, whereas (52b) is a BENEFACTIVE-STATE intransitive clause.

In a similar way, 10 types of transitive clauses can be derived. For example, an ACTION verb takes a factitive object to form a ACTION-COMPLETABLE transitive clause:

(53) Mími xiě (xīn)3 (le)
     A     O
S: P: O: Asp:
n  tv  n  pc
'Mími writes (a letter).'
'Mími now writes (a letter).'

Moreover, a transitive verb may have a derived feature ACTION-PROCESS plus a selectional unit like BENEFACTIVE, yielding a clause which Washburn (1975) refers to as BENEFACTIVE-ACTION-PROCESS transitive clause:

(54) Mími gěi (le) (háiži) (qián) (le)
     A   B   O
Mími give le child money le
S: P: Asp: IO: DO: Asp:
n  tv  pc  n    n  pc
'Mími gives (money) (to the child).'
'Mími now gives (money (to the child).'
'Mími gave (money) (to the child).'

Having discussed all the types of clauses in terms of their deep and surface structure and the realization rules that connect the two, Washburn (1975) finally provides a classification of Chinese verbs. It is based on the type of clause in which a verb occurs. That is to say, there are roughly as many types of verbs as there are clauses. Owing to the lack of space here, they will not be listed verbatim since
all of them can be derived from the categories, selectional units and derived features provided above.

3.3 Summary

As shown above, there have been a number of different major approaches to the relationships between verbs and nouns (in our model, better described in terms of processes and participants) and some important studies on verb-noun or case relations in Chinese. They have contributed to the understanding of the relationships each in its own way. However, none of them adopted the approach outlined in the previous chapter, i.e. the cognitive approach, which focuses on modeling the knowledge of the speakers and studying the conceptual structure of processes and participants, and their relationships. Most of the theories did not distinguish conceptual processes and participants from their lexical realizations, i.e. verbs and nouns. Using a connectionist theory, cognitive linguistics, on the other hand, believes that conceptual processes and participants are at a higher level and are connected with the lexical items at a lower level. However, the correspondence between the two levels is not one-to-one. In addition, most of the earlier approaches did not take into account how people actually deal with categorizations since they were mostly interested in working out a formal and elegant system. For example, the thematic relations in generative grammar are based on a set of binary features as primitives and operate in a mathematical manner.
But cognitive linguistics contends that the cognitive processes, linguistic or otherwise, of human beings should show prototype effects although they operate on categorizations. Some of the theories treat the semantic-conceptual relationships of processes to participants as a secondary phenomenon derived from syntactic structures. For instance, the thematic relations are regarded in generative grammar as part of the semantic component to interpret the syntactic structures. The valency theory focuses on the syntactic structures in which a verb can occur and adds the roles of the syntactic elements as a function label. In cognitive linguistics, syntax functions as the means to express meaning, and therefore, is regarded only as an epiphenomenon of the semantic-conceptual structure (See Lamb 1991a). Some of the theories like case grammar attempt to establish a set of universal roles across-languages and assign general frames for verbs. Cognitive linguistics, though not opposed to universals, maintains that case roles are derived from the relationships between processes and participants and that these relationships vary from process to process. Although some general roles can be set up, they are categories on the top of the hierarchy (Lamb 1991a). Based on the actual use of processes by Chinese speakers, we find that different frames can be established for the same process and its participant(s) may play a different role. Finally, most of the previous approaches did not focus on the conceptual
categories of processes and the categories of their presupposed participants, and their conceptual relationships, based on a large number of verbs. Halliday's (1985) systemic grammar has to some extent explored some semantic-conceptual properties of processes and the conceptual roles of their participants. It does not, however, explicitly adopt a cognitive approach. Therefore, it can be used as our basis to start. But we will go beyond it.

Previous studies of Chinese resemble what we have seen above. Chao (1968) did not explain why the diversity of relations existed between verbs and nouns in Chinese although he listed many interesting examples. Li's (1972) study exactly followed case grammar and was only concerned with assigning deep cases and the rules of deriving the surface structure. Teng's (1975) study concentrated on the identification semantic roles in Chinese and their cooccurrence with different types of verbs. He did not touch on the conceptual structure of processes and participants, but rather treating the roles as the means for assigning deep structures. Washburn (1975) was mainly concerned with the syntactic structures of Chinese clauses.

Although some classifications of processes have been attempted, they have been limited in scope or based on a non-cognitive approach. For example, Teng (1975) included more several dozens of lexical verbs. He adopted Chafe's (1970) model which divides verbs into three major categories: action,
process and state. Washburn (1975) classifies verbs according to the types of clauses in which they occur. Li (1972) follows Chao (1968) and Wang (1964) who use transitive and intransitive as the major categories of verbs. A cognitive approach will, therefore, provide a way of looking at the area of study from a new perspective. Moreover, the inclusion of 300 verbs will also furnish a more solid and comprehensive basis of the study.
Notes to Chapter 3

1. 'verb' and 'noun' are syntactic terms. In this study, we are concerned with the conceptual structure of Chinese processes and participants. In the view of cognitive linguistics (Lamb 1991a), they are the lexical realizations of process and participant.

2. According to Washburn (1975), Os stands for 'the Theme of state'.

3. This sentence sounds odd to Mandarin speakers.
Chapter 4

KNOWLEDGE OF PROCESSES AND PARTICIPANTS

In Chapter 2 and 3, the principles of cognitive linguistics have been outlined and compared with other approaches. Some theoretical and practical considerations has been given to the representation of knowledge in a Chinese conceptual dictionary. In this chapter, we will look into the types of knowledge about the relationships between processes and participants in Chinese which are being coped with in this study.

As explained in Chapter 2, one of the major objectives of cognitive linguistics is to model the knowledge of the speakers of a language. In order to study the relationships between processes and participants in Chinese with the cognitive approach, we will first look at the knowledge which Chinese speakers have about them. Based on our data, we find that there are basically three types of knowledge that are important for Chinese speakers to comprehend the relationships between processes and participants: knowledge about the world, linguistic knowledge and pragmatic knowledge.

4.1 Knowledge about the World

Human beings perceive the world through their cognitive apparatus. They tend to construe the universe as having discrete objects and categories according to their experience although there are no clear-cut boundaries among them. The results of those categorizations have been referred to as
folk taxonomies, which, according to Tyler (1969:26), are the descriptions of conceptual categories. Taxonomic models are common in cognition and they are built into languages throughout the world. Moreover, taxonomies are among the most common means that human beings use to make sense of their experience (Lakoff 1987:119). We believe that there are two major types of conceptual categories in the speaker's cognitive system: Process and Participant. Here we follow Halliday's (1968:209) assumption that the system of Process and Participant provides a conceptual framework for the encoding of experience. However, we add that this conceptual framework is also responsible for the decoding of second-hand experience which human beings get from hearsay. That is to say, human beings do not have to acquire experience with the world by themselves. They can always learn from the experience of others.

We consider Process and Participant the primary components of the conceptual representations of clauses, the units which the speakers produce and comprehend during linguistic processing. At the morpho-syntactic level, their realizations are prototypically marked as nominal and verbal phrases, respectively (Hopper and Thompson 1984; Halliday 1985). In other words, Process and Participant are two distinct types of entities in the cognitive system of human beings. They are typically realized by or decoded from, the verbal phrase and the nominal phrase.
Process and Participant are subcategorized according to human beings' knowledge about the world as reflected in their languages. For example, participants can be grouped on the basis of whether they are animate, human, etc. Each such subcategory can be further subclassified by other criteria. For instance, among concrete objects, we may have stationery, cooking utensils, furniture, etc. The criteria for classification may be formal, semantic, cultural or functional (cf. Conklin 1969, Labov 1973).¹ Again, the subcategories can be further divided into still smaller classes. The bottom-line is that each class may contain a small number or even just one individual participant, depending on how far the analyst wants to go and what purposes he has. A tentative partial classification of participants in Chinese is given in Appendix 1.

Folk taxonomies have complicated structures. Although they have hierarchies, some elements of one category may belong simultaneously to several distinct hierarchical structures. According to Conklin (1969:50), subhierarchies may be interarticulated in numerous ways and there is always the potentiality of partial inclusion or domain overlap. Furthermore, the terminal categories of one taxonomy may become the nonterminal categories of another taxonomy.² Finally, not all folk categories, as Conklin (1969:50) points out, are directly related by class inclusion or contrast within the range of a particular superordinate category.
Thus, part-of (part-whole) relations are often complicated by ambiguities not encountered in the analysis of kind-of (class inclusion) relations. He (Conklin 1969:50) states that the segregates plant, stem, sap are not related taxonomically like plant, tree, elm. In our model, we should take these problems into account.

Moreover, we find that these folk taxonomies may not be unified. For some people, qī'é 'penguin' is a kind of bird because it has feathers and wings. For others, it is not a bird since it does not fly. The categorization of processes and participants by human beings may vary with individual cognitive systems. For example, an illiterate person may think that jīngyú 'whale' is a type of fish. But an educated individual knows that it is a mammal. In the present study, the speakers are assumed to be typical, educated and adult Chinese users who have competent knowledge about their language, common sense of the world and knowledge about the pragmatic aspects of communication.

In the case of processes, they are normally classified in many different ways. One plausible way is to categorize them according to their temporal properties. The reason given is that a verb\(^3\) presupposes and involves the notion of time (Vendler 1967:97). For example, Vendler (1967) divides verbs into four classes: states, activities, achievements and accomplishments, according to their compatibility with tenses, logical entailments and temporal adverbial phrases. These
labels are purely semantic, but the criteria for classifying them are not. According to Vendler, for example, states and activities can be distinguished by the criterion of whether they possess continuous tenses. From activities, accomplishments can be separated by asking the question 'For how long did he ...?', for they fail the test. Furthermore, achievements can be told apart from accomplishments by asking the question 'At what time did you ...?'. The examples of his classifications are shown in Figure 1:

<table>
<thead>
<tr>
<th>States</th>
<th>Activities</th>
<th>Accomplishments</th>
<th>Achievements</th>
</tr>
</thead>
<tbody>
<tr>
<td>know</td>
<td>run</td>
<td>paint a picture</td>
<td>recognize</td>
</tr>
<tr>
<td>believe</td>
<td>walk</td>
<td>make a chair</td>
<td>spot</td>
</tr>
<tr>
<td>have</td>
<td>swim</td>
<td>deliver a sermon</td>
<td>find</td>
</tr>
<tr>
<td>desire</td>
<td>push a cart</td>
<td>draw a circle</td>
<td>lose</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1

Obviously, some categories of Vendler's verbs contain both processes and participants in our sense. This suggests that the temporal properties of verbs are not determined by the verbs only, but also by the objects they take.

Following Vendler (1967), Dowty (1979) devised a larger set of refined criteria for distinguishing the four types of verbs. He retains some of Vendler's diagnostic devices, e.g. nonstatives occur in the progressive. But, he also created his own tests, e.g. only nonstatives can occur as imperatives. To distinguish between activities and accomplishments, Dowty (1979:56) adds the test of in or for-adverbial, that is activities only take adverbials with for, while accomplishments take adverbials with in. According to Dowty
(1979), achievements differ from accomplishments in that they do not occur as the complements of verbs like stop and finish. We find that some of his criteria are tenable, while others are not. For example, achievements, according to Dowty's tests, can occur as imperatives. However, verbs like spot, recognize, etc. which Dowty and Vendler regard as achievements can hardly occur as imperatives. Moreover, Dowty (1979) admits that some activity verbs may occur as accomplishments if they take a locative of destination or an adverb of extent, e.g. 'John walked to the park' can be the complement of the verb finish: 'John finished walking to the park'. Thus, the whole verb phrase must be taken into account in order to maintain those distinctions, or even the whole sentences. Finally, Dowty (1979) subcategorized the four groups of verbs according both syntactic and semantic features. For example, under statives, he includes intransitive adjectives (e.g. be tall, big, green, etc.), intransitive verbs (e.g. exist, be rumored, etc.), transitive and two-place phrasal adjectives (e.g. like, similar, proud of, etc.), transitive verbs (e.g. love, hate, resemble, be, know, etc.), and two-place phrasal verbs (e.g. be in, sit, flow, be pleased, etc.). Moreover, the stative-transitive verbs have, among other things, the semantic categories of physical perception verbs (e.g. see, hear, etc.), cognitive verbs (e.g. understand, believe, etc.), and psych-movement verbs (e.g. dismay, worry, surprise, etc.). In addition, Dowty (1979) also allows some verbs to belong to
more than one category simultaneously. For instance, feel, smell, etc. are both statives and activities.

Davis (1983) proposes to categorize English verbs with the semantic parameter PERIODICITY. According to him, English verbs can be arranged along the scale of periodicity, with active verbs at the end of short periodicity and the stative verbs at the end of long periodicity. Following Davis (1983), Huang (1985) presents a different approach to the temporal properties of Chinese verbs. She advocates a way to classify Chinese verbs according to the semantic concepts of periodicity, ATOMICITY and VENUEHOOD. Huang (1985:3) states that periodicity involves the period of time required for a recurrence of an event. This period varies from verb to verb. Based on the variation, Chinese verbs can be treated as having short, mid- or long periodicity. Her classifications are shown in Figure 2:

<table>
<thead>
<tr>
<th>short PERIOD</th>
<th>mid-PERIOD</th>
<th>long PERIOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>sǐ 'die'</td>
<td>pǎo 'escape'</td>
<td>zhídào 'know'</td>
</tr>
<tr>
<td>pǎo 'escape'</td>
<td>kū 'cry'</td>
<td>liǎojiě 'understand'</td>
</tr>
<tr>
<td>tiào 'jump'</td>
<td>chuān 'wear'</td>
<td>hǎo 'good'</td>
</tr>
<tr>
<td>dǎ 'hit'</td>
<td>tǎng 'lie'</td>
<td>zài 'be at/in'</td>
</tr>
</tbody>
</table>

Figure 2

She notes that short-periodicity verbs can be divided into at least two types: the ATOMIC like sǐ which is unrepeatitive and the UNATOMIC like tiào and dǎ which are potentially repeatable. Thus, the former occur only with the perfective aspect marker le, whereas the latter are compatible with both le and the imperfective marker zài/zhe. The mid-periodicity
verbs, too, can be subgrouped, e.g. one group is ACTIVE like kū and chi. The other group which contains verbs like chuān and tāng has an ambivalent status, that is, it is both ACTIVE and STATIVE. Finally, Huang (1985) says that Chinese verbs can also be categorized with the VENUEHOOD feature which determines their compatibility with the resultative locative, e.g. those occur with the resultative locative are treated as [+venue], the rest are [-venue]. Thus, shuāi 'fall down' and tiào 'jump' fall into the [+venue] group, while sǐ 'die' and yǎo 'bite' come under the [-venue] group. As is evident from the examples, Huang's criteria are neither purely temporal nor purely syntactic. Moreover, the criteria here are relative, not absolute. There is also overlapping. Accordingly, these categories form a continuum rather than discrete elements (For details, see Huang 1985).

Another alternative is to classify verbs according to both syntactic and semantic features. For example, Anderson (1971) distinguishes four basic types of verbs: State, Process and Action [+reflexive] and Action [-reflexive]. His method reminds us of Vendler (1967) and Dowty (1979), e.g. state and non-state are distinguished by whether they occur in the progressive. The difference is that Anderson does not use the tests of adverbials and entailments. Moreover, Anderson (1971) is more consistent by using only syntactic terms for dividing the main groups. However, the derived categories of each type are specified on semantic grounds in conjunction
with the semantic roles they presuppose. For example, adding abstract location to state verbs yields state experiential verbs which contain cognitive verbs, emotional verbs, sensation verbs, etc.

There are some Chinese linguists who have made similar attempts. They all use the approaches adopted in traditional grammar. For example, Wang (1964) divides Chinese verbs into transitive and transitive and subclassifies them according to their semantic features. Among intransitive verbs, he distinguishes between action, e.g. lái 'come' and status such as bìng 'ill'. In contrast, transitive verbs have more subgroups: quality, e.g. pà 'be afraid', classificatory, e.g. shí 'be', perceptual, e.g. kàn 'look', quotative, e.g. shuō 'say', etc. in addition to action and status. Chao (1968) holds a similar view. However, he has fewer subgroups for transitive verbs and adds quality verbs like dà 'big' to intransitive. As shown in 2.2, Li (1972) combines Wang's and Chao's schemes. The only difference is that Li employs action and quality-status as the basic distinction, then the intransitive and transitive bifurcation, and finally the semantic and syntactic subcategorization (For details, see 2.2).

The third alternative is to classify the verbs on their case frames. For example, Fillmore (1968) arranges the basic verb types according to their case frames, e.g. state verbs make use only of the 0 case, while action verbs take the A
case alone or both A and O. Other types are derived in terms of their compatibility with cases like I, D or L. Chafe (1979) organizes the English verbs in a similar way although his categories are little different. He bases his classification on a binary system, viz. verbs can be either states or events which include process, action and action-process as subclasses. According to Chafe (1970), states and processes require a Patient, actions require an Agent, and action-processes require both Agent and Patient. Teng (1975) follows Chafe's (1970) taxonomy. However, Teng adds locative to some types of verbs since he believe some Chinese verbs presuppose Location.

As shown earlier, Halliday also (1985) defines his categories partially in semantic terms. For example, material processes are processes of 'doing' which express that some entity 'does' something; mental processes are processes of 'sensing'; and relational processes are processes of 'being'. The minor categories like behavioral and verbal are characterized in a similar fashion. However, he also depends on some syntactic diagnostics. According to Halliday (1985) the probes for material processes are questions like 'what did X do?' or 'what did X do to Y?'. Prototypically, material processes require an actor or an actor and a goal. On the other hand, mental processes fail the tests for material processes. Moreover, one of the participants of mental processes is prototypically human and the other is very broad
in semantic scope, i.e. it virtually includes every thing in the universe. Halliday adds that the unmarked present tense for mental processes is the simple present, as in Mary likes Bill, whereas the unmarked present tense for material processes is the present in present, as in John is hitting Bill. In addition, most mental processes are represented in the English language as two-way processes, e.g. 'I like it' = 'it pleases me'.

At this point, questions are in order as to whether we should categorize processes in one of the ways discussed above and also how we do it. Let us first recall the objectives of this study. We have made it clear in the previous chapter that one of our tasks is to find out how the knowledge of Chinese speakers is structured at the conceptual level. We have argued that processes are one type of concepts therein which are realized as verbs or adjectival verbs at the lexicosyntactic level. Like participants, they have categories and hierarchies as shown in those studies discussed above. Moreover, our purpose is find out the correlations between different groups of processes and their relationships to participants. Therefore, we need a taxonomy of processes. In addition, we have demonstrated in 2.5 that the users acquire their knowledge using analogy, based on the similarity between or among things. Accordingly, they tend to group related things together. This further justifies the categorization of
processes. The remaining question is how we can accomplish the task. Which way to choose?

Our commitment to cognitive linguistics requires that we find a way that is cognitively realistic, that is, it must conform to the way Chinese speakers construe reality. The afore-mentioned approaches all have their strengths and weaknesses. Vendler (1967) and Dowty (1979), though rightly pointing out that all processes are anchored in time, are only concerned with the semantics of aspectual properties of linguistic elements so that they blur the distinction between processes and participants. Moreover, their tests are numerous and heterogenous. Therefore, the utility of their criteria is not amenable to our cognitive approach. The system presented by Fillmore (1968) and Chafe (1970) is based on the case frames of the verbs. But we believe that case roles are just derived from the relationships between processes and participants which are in turn determined by the semantic categories of processes and participants. So the semantic features of the processes and participants involved in a frame is more basic. Accordingly, Davis's (1983), Huang's (1985) and Halliday's (1985) semantic characterizations of verbs or processes are more representative of the speakers' knowledge of their language. Therefore, we follow Vendler's and Dowty's assumption that verbs involve the notion of time. But we will not use their complex system of tests. Then, we employ Halliday's term
'processes' instead of 'verbs' since it better expresses the idea that processes are at the conceptual level, while verbs are their lexical realizations. Moreover, he defines his categories of processes in connection with categories of participants. This conforms to our findings that categories of processes correlate with categories of participants (see Chapter 7 for details). At the top of the taxonomy, however, we adopt Davis's (1983) and Huang's (1985) semantic feature 'periodicity' and the cooccurrence of processes with aspectual markers since Chinese does not have a morphological tense system. In addition, these criteria, we believe, more compatible with processes in Chinese although Halliday's (1985) syntactic diagnostics are useful for English, but not for Chinese. More importantly, Chinese speakers have knowledge about the prototypical length of time involved in a process. Thus, our approach here is a synthesis of several theories. However, our scheme is different from Huang's in that we add one more basic category; that is, the mid-long periodicity between long and mid-, for processes like bìng 'ill' and ài 'love', though presupposing a longer period of time than pāo 'run' and ku 'cry', requires a shorter period of time than gāo 'tall' and hǎo 'good'. Thus, on the continuum of periodicity, we have four groups ranging from short to long, as in Figure 3:
<table>
<thead>
<tr>
<th>Event</th>
<th>Action</th>
<th>Status</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>short</td>
<td>mid-short</td>
<td>mid-long</td>
<td>long</td>
</tr>
<tr>
<td>sì 'die'</td>
<td>kāi 'open'</td>
<td>máng 'busy'</td>
<td>gāo 'tall'</td>
</tr>
<tr>
<td>dào 'fall'</td>
<td>tī 'kick'</td>
<td>hén 'hate'</td>
<td>cháng 'long'</td>
</tr>
<tr>
<td>pò 'break'</td>
<td>rēng 'throw'</td>
<td>pà 'afraid'</td>
<td>xìng 'named'</td>
</tr>
<tr>
<td>tíng 'stop'</td>
<td>guān 'close'</td>
<td>xiàng 'hope'</td>
<td>xiàng 'like'</td>
</tr>
</tbody>
</table>

Figure 3

Moreover, we would like to give semantic labels to these classes for convenience's sake. The two on the left are traditionally referred to as actions, whereas the two on the right are called states. For processes with short periodicity, however, we use Halliday's term EVENT. To mid-short processes, the traditional term ACTION is applied. The mid-long ones are referred to as STATUS. Finally, we also employ the traditional label STATE for the long processes.

The categorization here correlates with some grammatical features in Chinese. The event group normally does not occur with the progressive aspectual markers zài/zhe, but with the perfective marker le. The action group can take any of them. The status group are usually compatible with one of them: zhe. The last group, i.e. States, mostly cooccur with only le. Moreover, there is also a difference in the conceptaul roles of the participants which these groups require. The event group typically takes only one participant which is usually inanimate. In the action group, some take one participant, others take two, and still others take three. The first participant is usually animate, while the second is usually inanimate if there are two participants. If there are three
participants, the first two are human whereas the third is inanimate. The status group can have one or two participants, with the first one being human and the second one being virtually anything. The state group typically requires one participant and its conceptual category is open (See Chapter 7 for details).

Furthermore, there are subcategories for each basic type of process based on semantic features of the processes or the semantic relationships of processes to participants. For those subcategories, we also use some semantic labels taken from the theories discussed earlier, e.g. Halliday (1985) and Dowty (1979), in addition to our own terms. Thus, for example, the category EXPERIENCE has physical and mental as its subcategories. In turn, the subcategories may have their own subcategories. For instance, the mental experience may have as its subcategories emotional, perceptual, cognitive, etc. The more detailed categorization of processes in Chinese is shown in Appendix 2.

Once again, we should remember that the classifications of processes and participants we have proposed are just approximations. There are always overlapping cases since we are dealing with unbounded aggregates rather than discrete categories. In addition, human beings regard things as interrelated and tend to associate one category with another that shares some similarity. To be realistic, therefore, our
model should also allow cross-classifications of processes and participants. For example, *xihongshi* 'tomato' is both a kind of vegetable and a kind of fruit for Chinese speakers. *xuexiao* 'school' is an institution as well as a place. Some participants may belong to more than two categories, e.g. *cha* 'tea' is either a commodity or a beverage or a plant, etc. In the same way, a lexicval verb may be assigned to more than one conceptual category, e.g. *qi* 'anger' is a state verb as well as a causative verb, as shown in the following sentences:

(1) a. Tā qi de gōuqiàng
    he anger DER a lot
    'He was very angry.'

    b. Tā qi wǒ le
    he anger I LE
    'He made me angry.'

According to our categorizations, *qi* in (1a) expresses a kind of experience, hence having longer periodicity, while the *qi* in (2b) normally stands for a causation, a process that lasts a shorter period of time.

In addition, our model should also take into account the fact that there are actually no clear-cut boundaries among categories. That is, there are always borderline cases which are difficult to decide. If the process *chang* 'sing', for example, is an action, is *tang* 'lie (on)' an action? The case is not so obvious because it presupposes longer period of time. In this case, we have some formal criteria, e.g. the aspectual markers. However, these criteria may not be completely applicable to some cases. For example, event
processes normally do not take either zài or zhe. Yet, the
process xiè 'wither' can take zài, but not zhe. Is it still
an event or something else? To deal with these cases, as
suggested in Chapter 2, we follow Rosch's theory of
prototypicality which has been shown to be a realistic model
of human cognition. Accordingly, we envisage our categories
as containing both prototypical members and non-prototypical
members. In the case xiè, it is a non-prototypical event
process. As further examples in Chinese, máqué 'sparrow',
yànzi 'swallow', etc. will be the prototypical members of the
category niǎo 'bird', while gě'é 'penguin' will be a non-
prototypical member of niǎo.

Human beings do not just categorize things. Through
experience, direct or indirect, they seek to understand the
relationships among them, especially, the relationships
between processes and participants. For example, when the
speakers of Chinese see or are told that a bird flies in the
sky, they establish the relationship between the participant
niǎo 'bird' and the process fēi 'fly'. Using our analogy in
2.6, a connection is built in the speaker's conceptual
structure to connect them together. This connection serves as
the conceptual frame for the process fēi.

As argued also in 2.6, the building of connections is
continuing and dynamic. That is, the conceptual frame for a
process may be revised and modified at any time as new
knowledge is added. Let us now return to the same example.
When the speakers learn that an aeroplane and a kite can also fly, connections are built between fēijī 'aeroplane' and fēi, and between fēngzhēng 'kite' and fēi. As a result, the conceptual frame for fēi will be modified. An ideal model of language using processes of human beings should reflect this flexibility of the conceptual structure. For our purposes in the present study, therefore, it suffices to assume that the knowledge of the speakers is not perfect and it can be revised or modified. Thus, new knowledge can be added at any time.

Viewed from this perspective, the conceptual frames are just constructs of the human cognitive system. In other words, human beings are prone to building mental models of the world (Johnson-Laird 1985). In particular, for any state of affairs or event in the world, human beings normally conceptualize it as involving two types of entities: the reported event and the participants (Hopper and Thompson 1984). Conversely, they tend to code an event with the two basic categories. For example, the event of John's going to the park yesterday will be coded both in English and Chinese with two participants (an agent and a location) and an event (going) although the English version has an overt marker preceding the location:

(2) Chinese: Yuēhàn zuótiān qù gōngyuán le
    John yesterday go park LE
    John went to the park yesterday

This is cross-linguistic and universal. It reflects the cognitive strategies of human beings in perceiving and
cognizing the world. In this connection, we agree with Dirven and Taylor's (1988:382) claim that linguistic categorization is merely an aspect of human categorization in general.

4.2 Linguistic Knowledge

Linguistic knowledge enables speakers of a language to operate with the specific linguistic structures of their language. It includes information about what linguists traditionally refer to as word order, lexical field, etc. By word order, we mean that the speakers of Chinese know the unmarked and marked sequences of process and participants of a process, given the relationships between process and participants. It is different from the usual sense linguists have attached to it, viz. the order of syntactic units like subject and object. In our model, word order is the information which the speakers have in their lexical structure for arranging the realizations of processes and participants in appropriate sequences. As discussed in 1.1, word order in Chinese partially expresses the semantic roles of the participants, and together with the semantic categories of participants, it determines the relationships between processes and participants. This kind of knowledge is learned through direct acquisition of specific combinations, extended by analogy, i.e. the speakers acquire the information by storing massive numbers of exemplars (For details about learning through analogy, see 2.5).
In this section, we will closely examine what Chinese speakers know about word order and how it determines their understanding of the relationships between processes and participants. First of all, we believe that the knowledge about word order is language-specific. For example, Chinese speakers know that the event of John's hitting Bill is expressed unmarkedly in the sequence Participant (hitter) + Process + Participant (hittee):

(3) Ṭuēhàn dâ le Bī'ēr.
John hit LE Bill
'John hit Bill.'

whereas the order of its counterpart in Austronesian languages like Ilocano, as known to its speakers, would be different, as shown below:

(4) k-in-abil ni Hwan ni Pedru
hit det Juan det Pedro
Process Participant Participant
hitter hittee

Li and Thompson (1974 and 1975) propose that Mandarin Chinese has been undergoing a change from SVO to SOV as a result of grammaticalization of serial verb constructions. Their major argument is that definite nouns, whether subject or object, tend to be placed before the verb, whereas indefinite nouns tend to follow the verb (Li and Thompson 1975:165). Givón and Sun (1985:330) contend that neither Li and Thompson's studies nor those which have followed them with either approbation or dissent, are based on the study of text, but from isolated, out of context examples, most often thought up by the linguists themselves. They therefore argue that,
based on their quantitative study of both written and spoken Mandarin texts, Mandarin is as rigid a VO language as, say English or Biblical Hebrew, and there has been no drift from SVO to SOV (Givón and Sun 1985:344). Their findings show that both written and spoken texts use VO overwhelmingly, 94% for the written language and 92% for the spoken language, and among them, the definite objects exhibit 90% VO for the written form and close to 90% for the spoken form (Givón and Sun 1985:336). They conclude that the functional distribution of OV is an emphatic/contrastive discourse device, having little to do with the contrast between definite and indefinite objects (329). Wang (1987) also presents the results of his quantitative study of VO/OV variation. He agrees with Givón and Sun that in terms of text distribution Mandarin is an SVO language and that there has been no diachronic drift from SVO to SOV (Wang 1987:100). However, he contends that the correlation between definite/indefinite and OV/VO does exists in Chinese and that the bable-constructions should be distinguished from and considered less contrastive/emphatic than other OV constructions (120). None of them specifically use the term 'unmarked order', but they all seem to have suggested that the unmarked word order occurs in greater frequency, as can be seen from Li and Thompson's employment of the word 'tend', and Givón and Sun's statistics.

We agree with Givón and Sun(1985), and Wang (1987) that Chinese word order is SVO. However, we approach this matter
from a different angle. We propose that SVO is the unmarked word order in Chinese. That is, for any process and its participants there are always the unmarked order and the marked order(s). The users switch orders for different discourse or communicative purposes. This issue can be talked about in terms of markedness. Although it is still controversial what constitutes markedness, the unmarked word order in Chinese, as we see it, is the one with the one which is neutral in meaning. It follows that the marked word order has additional semantic features. For example, there are four possible sequences of (3) if in marked order:

(5)  

a. ?Yuēhàn Bǐ'ěr dǎ le
    John Bill hit LE
    'As for John, Bill hit (him).'</n    'As for John, he hit Bill.'</n
b. ?Bǐ'ěr Yuēhàn dǎ le
    Bill John hit LE
    'As for Bill, John hit (him).'</n    'As for Bill, he hit John.'</n
c. Yuēhàn bā Bǐ'ěr dǎ le
    John BA Bill hit LE
    'John hit Bill.'</n
d. Bǐ'ěr bā Yuēhàn dǎ le
    Bill BA John hit LE
    'Bill hit John.'</n
In (5a) and (5b), no participant is formally more marked, but the order is different form (3), i.e. the two participants are both placed before the process. To Chinese speakers, whichever participant comes first in (5a) is the topic. But which is the hitter is not clear since both participants are human as shown by the ambiguous English translations; hence
they are accepted with difficulty as good Chinese sentences. Although both participants are definite, the fronting of the second results in confusion. In this case, the marker bā has to be used to indicate the hittee. For example, in (5c) and (5d), both participants also come in front of the process, but the one preceded by the marker bā is the hittee, hence formally more marked.

According to Givón and Sun (1985), participants with bā also have contrastive/emphatic meaning. Wang (1987) argues that bā-constructions are less contrastive/emphatic and the definite/indefinite distinction does exist between OV/VO. We disagree with Wang (1987) since the participants following the processes can also be definite as shown in 1.1 and by Givón and Sun. As argued in 1.1 preverbal nouns can also be indefinite when there is negation. Even if we exclude negation from our discussion, we can only say that preverbal nouns tend to be definite, but there is no definite/indefinite distinction between OV and VO. In the case of bā, it is not clear what Wang (1987) means when he declares that bā-constructions are less contrastive/emphatic. Is there still some contrast/emphasis? In our view, participants preceded by bā are in fact definite in most cases. However, bā is not present to render the participant that follows it definite because any preverbal participant without bā can also be definite. It does not sit there idling, doing nothing, either. Moreover, it does not perform the
contrastive/ emphatic function that Givón and Sun (1985) suggest. We argue that the bǎ-constructions actually emphasize the process rather than the participants. This is exemplified by the fact that only the bǎ-construction can be used when questions like 'what did you do to X?' are asked in Chinese. For example, the following sentence can be used as a question that has an answer like (3):

(6) Yuēhàn bǎ Bǐ'ěr zěnme le
    John bā Bill how LE
    'What did John do to Bill?'

Evidently, bǎ-constructions are the only candidates for emphasizing the process. In this case, they are also semantically more marked (cf. Hopper and Thompson 1980).

The distinctions between the unmarked and the marked orders can also be talked about in terms of asymmetry. The unmarked order is symmetrical because its postverbal position allows both definite and indefinite noun phrases:

(7) a. Yuēhàn kàn le wǒ de shū
    John read LE I DE book
    'John read my book.'

   b. Yuēhàn kàn le yī běn shū
    John read LE one CL book
    'John read a book.'

In contrast, the preverbal positions in the marked order admit only definite nouns:

(8) a. wǒ de shū Yuēhàn kàn le
    I DE book John read LE
    'My book, John read (it).'

   b. *yī běn shū Yuēhàn kàn le
    one CL book John read LE
c. Yuēhàn wǒ de shū kàn le
   John I DE book read LE
   'John read my book.'

d. *Yuēhàn yī běn shū kàn le
   John one CL book read LE

Clearly, the marked order is asymmetrical since it is more restrictive with respect to the distribution of noun phrases. To put it another way, the marked order is designed to perform special functions which the unmarked order is not capable of.

Comrie (1986:86) proposes that the construction type which is least marked formally is also least marked in terms of properties of the real world, or more accurately in terms of people's conception of the world. His observation is applicable to (5c) and (5d), but not (5a) and (5b) which are not more formally marked than (3) and, however, have extra meanings. Consequently, Chinese speakers depend for their knowledge about the relationships between processes and participants and only partially on formal markings. For example, as in (5c) and (5d), the marker bā always denotes the hittee when the hitter and the hittee are both placed before the process dā. In the case of (5a) and (5b), the speakers cannot rely on formal markings, but only on the word order, for part of their knowledge about the relationships between processes and participants. That is, the speakers understand that if the two participants, i.e. the hitter and the hittee, both precede the process and there is no formal marking, then the one that comes first is the topic and the second one has the contrastive/emphatic meaning. The knowledge about word
order only works partially since the hitter and the hittee cannot be told apart unless the context is clear. Therefore, it is only the unmarked order as shown in (3) that will not result in any ambiguity. That is one reason why we should pay our attention first to the unmarked order of processes and participants. This knowledge about word order depends partially on the semantic categories of the participants. That is, different participants occurring with the same process may require different word order restrictions. For instance, the process māi 'buy' has the unmarked order buyer + process + buyee, as shown below:

(9)  Yuēhàn māi le shū  
     John buy LE book  
     'John bought the book.'

The marker bā can only precede the buyee which in turn must directly precede the process when it is fronted:

(10) a. Yuēhàn bā shū māi le  
     John BA book buy LE  
     'John bought the book.'

b. *shū bā Yuēhàn māi le  
   book BA John buy LE

c. *bā Yuēhàn shū māi le  
   BA John book buy LE

d. *bā shu Yuēhàn māi le  
   BA book John buy LE

This is because the user knows that only Yuēhàn can be the buyer if Yuēhàn and shū are present, and the buyee with bā cannot precede the buyer. If the buyer and the buyee both precede the process and no bā is present, only Yuēhàn can be interpreted as the buyer since a book cannot buy a person:
(11) a. shū Yuēhàn māi le
    book John buy LE
    'As for the book, John bought (it).'

b. Yuēhàn shū māi le
    John book buy LE
    'John bought the book, (not the pen).'

Obviously, the semantic categories of the participants play a role here in determining the relationships between the participants involved. This shows the importance of the unmarked order and the semantic categories of the participants.

As demonstrated above, the speakers' knowledge about the relationships between processes and participants is related to word order, formal markings, and the semantic categories of the participants. In most cases, the unmarked order and the semantic categories of the participants, play a crucial role in allowing the hearer to determine the semantic roles of the participants. Therefore, word order should be included as part of the information which Chinese speakers use in producing and comprehending Chinese sentences in specific contexts. In our dictionary, only the unmarked order will specified in the conceptual frames of processes. Marked orders are fairly regular and therefore, only merit general statements. For example, a rule can be formalated stating that if the second participant of the process is placed at the clause-initial positon in the lexical realization, it becomes the topic of the clause.
As shown before, a sentence with an unmarked order contains no formal marking and no expected meaning apart from those of the process and participants. Consequently, conceptual frames are built from data that have the unmarked order. In the conceptual entries, moreover, the order of lexical realizations is specified according to the sequence. For example, a conceptual frame can be constructed for *chī* from the following data:

(12)  a. Yuēhàn chī píngguǒ
John eat apple
'John eats apples.'

b. Niú chī cǎo
cow eat grass
'Cows eat grass.'

Since John is human and cow is animal, they belong to a higher category of animate, so the first participant of *chī* should be specified as animate, whereas the second participant can be fruit and plant. But this is not enough because there are, as the data in the dictionaries show, many other things that can follow *chī*, medicine, food, etc. They do not belong to the same higher category. They have to be listed separately to show that the second participant can be any of the categories. Thus, one of the conceptual frames for *chī* will be like the following:

(13) EAT <ANIMATE:X (PLANT,FOOD, MEDICINE, ...):Y>
R(X) chī R(Y)
Although all human beings categorize the world in certain ways, the results of their categorization of the reality are not congruent, i.e. they tend to vary from language to language. Berlin and Kay (1969) have shown that the basic color terms of different languages reveal their varied segmentations of the color spectrum, which is actually continuous, not discrete. In a similar fashion, people cut other aspects of reality into fragments. Langacker (1975) is correct in pointing out that categories are linguistic in character in that they are to a certain degree language-specific. Therefore, he (1975:354) argues, they may differ in precisely where along the the continuum they make divisions and how the categories are marked and interact with grammatical phenomena, while languages probably agree universally in imposing some kind of categorization. This process of categorization results in lexical fields whose members, are semantically related lexemes (Lyons 1977). We shall not go into the details of lexical fields here. It suffices to make two points on this issue. On the one hand, the speakers of a language know that the lexical items, (in our model, the participants and processes) are related in a field, which is exhibited in the conceptual structures as the hierarchies of categories. On the other hand, the speaker must learn how much an area each concept of a lexical field covers on the continuum since this information is only language specific.
Following Lyons (1977), we propose that there are two major types of lexical field, more precisely conceptual field. One is the part-whole relation (See Lyons 1977 for details). For instance, in English, the lexeme arm covers an area from the wrist to the shoulder. But limb covers the area from hand to shoulder. Thus, the relation between arm and limb is part-whole. The other type is subordination. For example, zhuōzi is only a kind of jiājū 'furniture' and shūjià 'bookshelf' is another type of jiājū, but they are not components of jiājū, hence zhuōzi and shūjià are subordinate to jiājū and jiājū is superordinate to both zhuōzi and shūjià.

These types of relation are not restricted merely to participants. They also exist among processes. For instance, the part-whole relation is found between chī 'eat' and jiăo 'chew' or wăn 'swallow'. Thus, Chinese speakers are cognizant of the fact that jiăo and wăn are components of chī. In contrast, Chinese speakers know that dīng 'stare' is just a special type of kàn 'look at'. Accordingly, the relation between them is that of subordination. That is to say, dīng is subordinate while kàn is superordinate.

Another type of knowledge that depends on the structure of Chinese is the traditionally called collocational restriction, that is, a process has a definite pattern of combining with participants. We refer to this pattern as conceptual frame. In our view, this kind of knowledge is to some extent language-specific since different languages may
have different collocational restrictions. For example, a person or a tree or a building is tall while a mountain is high in English, but all of them can combine with gāo 'high' in Chinese. Conversely, a person or a table is āi 'short/low' or āi 'short/low' in Chinese whereas a person is short and a table is low in English. Furthermore, this knowledge does not have to do with the knowledge about the world. But it may reflect the way in which the world is interpreted by the speakers of the language. For instance, in English we can say either 'John married Mary' or 'Mary married John'. In contrast, Chinese has three different words that mean marry. Each of them has a different conceptual frame. For example, jiēhūn 'marry' only takes one human participant that precedes it:

(14)  Yuēhān jiēhūn le  
       John marry LE  
       'John got married.'

whereas gū and jià require two human participants. The difference between them is that gū takes a male as its first participant and a female as its second participant, while jià does the other way round: its first participant should be female and second participant male:

(15)  a. Yuēhān gū le Mālì  
       John marry LE Mary  
       'John married Mary.'

b. *Mālì gū le Yuēhān  
       Mary marry LE John

c. Mālì jià le Yuēhān  
       Mary marry LE John  
       'Mary married John.'
4.3 Pragmatic Knowledge

In our study, pragmatic knowledge denotes the information which enables speakers of a language to use the language appropriately in particular contexts which include both social and cultural contexts. Accordingly, it is different from the knowledge about the context of situation, which tells the speaker what has happened earlier (cf. Li and Thompson 1978). In particular, pragmatic knowledge in our model is related to the correct use of processes in Chinese. Basically, it involves: a) the use of processes which have the same conceptual import, but different social and cultural functions; b) the use of different conceptual frames of the same process to serve different communicative purposes.

Let us first look at processes of the same meaning with different social-cultural implications. In 1.1, we have shown that xìng 'surnamed' and guìxìng 'surnamed' have the same semantic import, and the difference between them is that the former is generally used for informal purposes, while the latter signals the respect or honorification on the part of the speaker. So guìxìng is only used on formal occasions and, conceivably, it only appears in questions asking someone's surname since the speaker normally does not honor himself. A further example of this kind of pragmatic knowledge is the distinction between xīn and xīnli. They mean exactly the same thing, except that the former is used for general purposes,
whereas the latter is only employed in the formal style of Chinese. The same distinction applies to zhì 'cure' and zhīliào 'cure', sòng 'give (as gift)' and zèng 'give (as gift)', kāi 'drive' and jiàshī 'drive', etc.

A process in Chinese may have more than one conceptual frame. In this case, different conceptual frames of the same process may perform distinct communicative functions. In 1.1, it is shown that the process sǐ 'die' has two different conceptual frames: DIE <ANIMATE:X> and DIE <HUMAN:X HUMAN:_FAMILY-MEMBER:Y>. The second participant dies in the two-participant frame. The former indicates that the user only makes a neutral statement of what has happened. In contrast, the latter signals the sympathy on the part of the user. This type of information is not treated as the distinction between the marked and unmarked orders because it does not fall into either kind. This is due to the fact that the sympathetic version does not have either the topic or the emphatic/contrastive meaning as conveyed by the marked orders in Chinese. In our study, this kind of information is also included in the conceptual frames of processes whenever necessary.
Notes to Chapter 4

1. For example, Conklin (1969) lists 'formal', 'cultural' and 'functional' as possible types of criteria for categorization. By 'formal' he means morphological form (See Note 2). Labov, on the other hand, uses 'formal' as the shape of cups and 'functional' as the utility of cups. In our system, we consider 'functional', the semantic-conceptual properties of processes and participants, the major criteria, while the formal (syntactic) is treated as incidental properties.

2. Conklin's (1969) example is the morphologically distinguished kinds of floral segregates vs. functional categories of plant as food cultigens, medicines, ornamentals, etc.

3. The problem with using the term 'verb' (as Vendler 1967 does) is that verbs are just the lexical realizations of conceptual processes. A lexical verb may be the realization of several processes which may belong to different categories of processes (See 5.3).

4. In this study, events are treated as the instances of processes.
Chapter 5

THE ORGANIZATION OF THE KNOWLEDGE

In Chapter 4, some types of knowledge which Chinese users have about the use of processes has been explored. It has been shown that, in order to produce and understand Chinese, Chinese speakers must know the relationships between processes and participants which can be described by means of categories and conceptual frames. Moreover, the realizations of these frames are also constrained by the linguistic structure of Chinese. Finally, the use of processes is also motivated by some pragmatic factors. This chapter is concerned with the representation of such knowledge. In particular, attention will be paid to constructing a user-based conceptual dictionary which contains the knowledge of Chinese speakers about individual processes.

5.1 The Organization of Information about Participants

As shown in 4.1, the conceptual structures of processes and participants have categories and hierarchies which can be organized at the conceptual level in the form of tree-like structures in graphic representations. Since there are overlapping and cross-classifications, the structures are not really trees but networks with intertwining of subcategories. Using a cognitive approach, they can be said to be made up of sections, components of networks. As pointed out in 2.3, graphic notations are inconvenient for representing large quantities of information of the type found at the conceptual
level, but formulaic notations can be employed to provide a more readable account. In what follows, it will be shown how conceptual structures of participants can be organized and structured in the form of a conceptual dictionary in a formulaic notation.

There are no clear-cut boundaries between categories, and borderline cases are very common. The users, however, know what the prototypical instances of a category and what the non-prototypical instances of a category are. This information about prototypicality is not amenable to direct representation in graphic notation. In this case, the information has to be organized and structured to show the prototypical effects. The problem of prototypicality will be dealt with in this section.

First, the category to which a participant or process belongs can be specified right in the lexicon, viz. the conceptual dictionary. For example, in the dictionary of Chinese, the entry for the concept TABLE has the label FURNITURE for its category since it is one type of furniture. Likewise, all other concepts, e.g. CHAIR, BED, etc. that are types of FURNITURE will be specified. In turn, the entry for concept FURNITURE will have a specification of its category HOUSEHOLD-ITEM, alongside with other concepts of the same category like APPLIANCE, CLOTHING, COOKING-UTENSIL, etc. Again, HOUSEHOLD-ITEM, INSTITUTION, etc. constitute the category ARTIFACT which in turn is the a subcategory of NON-
LIVING. This series goes on until we reach the highest category THING which has CONCRETE and ABSTRACT as its immediate subcategories. Moreover, the whole dictionary can be arranged following the order of the hierarchies. The conceptual categories can be directly attached to the conceptual entries. Thus, a portion of the conceptual dictionary for Chinese can be structured like the following:

THING
CL: shìwù 'thing'

CONCRETE
CL: jùtīshìwù (THING)

ABSTRACT
CL: chōuxiàngshìwù (THING)

NON-LIVING
CL: fēishēngwù (CONCRETE)

LIVING
CL: shēngwù (CONCRETE)

HOUSEHOLD-ITEMS
CL: shēnghuóyòngpǐn (NON-LIVING)

CELESTIAL
CL: tiāntǐ (NON-LIVING)

INSTITUTION
CL: jīgòng (NON-LIVING)
...

FURNITURE
CL: jiājù (HOUSEHOLD-ITEM)

CLOTHING
CL: yīwù (HOUSEHOLD-ITEM)

COOKING-UTENSIL
CL: chūfāngyòngjù (HOUSEHOLD-ITEM)

APPLIANCE
CL: diànqì (HOUSEHOLD-ITEM)
...
TABLE
CL: zhuōzi (FURNITURE)

CHAIR
CL: yīzi (FURNITURE)

BED
CL: chuáng (FURNITURE)
...

As shown above, the hierarchical structure could be described just by including in each entry the category to which the concept belongs, without mentioning subcategories, but the type of organization would not be easy for the human reader to understand, because the representation would be too concise. It would be difficult for human readers to keep track of all the supercategories and subcategories. An alternative is to have some specification of the subcategories along with supercategories of each concept. In our system, a conceptual entry is designed to contain information about both its supercategories and subcategories, even though this design involves some redundancy. Thus, a portion of the Chinese conceptual dictionary will be structured like the following:

THING
SUB: CONCRETE, ABSTRACT
CL: shìwù

CONCRETE
SUP: THING
SUB: LIVING, NON-LIVING
CL: jùtīshìwù
...

NON-LIVING
SUP: CONCRETE
SUB: HOUSEHOLD-ITEMS, CELESTIAL-BODY, INSTITUTION,...
CL: fēishēngwù
...
Obviously, this kind of presentation of the information about hierarchies facilitates the reader's understanding of the inter-relationships among categories and the order of hierarchies although it looks somewhat redundant. Using this notation, it is not necessary to group the entries of the same category together in one place. Thus, the entries can just be arranged according their alphabetical order since the hierarchical structures of participants can be traced by checking both their supercategories and their subcategories spelt out in the dictionary.

Furthermore, the phenomenon of cross-classifications can easily be captured by this type of specification. In this case, a concept can have more than one supercategory. It has been pointed out that the concept TOMATO can be either a type of fruit or a type of vegetable for Chinese speakers. This information can be provided by having both FRUIT and VEGETABLE as its supercategories:

TOMATO
SUP: FRUIT, VEGETABLE
CL: xīhóngshì

In addition to information about super- and subcategories, knowledge about part-whole relations can also be specified in a similar fashion. For example, HAND has FINGER, PALM, etc. as its components, while HAND itself is part of UPPER-LIMB which is in turn a part of HUMAN-BODY in Chinese. The type of relations can be represented as below:

UPPER-LIMB
CONSTITUTE: HUMAN-BODY
COMPONENTS: HAND, ARM, ...
CL: shàngzhì
...
HAND
CONSTITUTE: UPPER-LIMB
COMPONENTS: FINGER, PALM, ...
CL: shǒu

If a category is specified in the conceptual frame for a process, it includes all the subcategories and all of their subcategories and so on. In other words, all the subcategories inherit properties of their parents. Accordingly, all instances of the descendent subcategories can be the participant presupposed by the process. In contrast, if a subcategory is specified, it does not include other subcategories of the same category; i.e. only the specified category and its descendent subcategories can function as the participant required. For example, if a participant of a process is specified as FURNITURE, then it encompasses all kinds of furniture. However, if a subcategory of furniture such as TABLE is specified, then it does not embrace other
subcategories of furniture like CHAIR and BED, but itself and its subcategories like DINNER-TABLE and WRITING-DESK.

However, as Rosch (1973) shows, members of a category contains both prototypes and non-prototypes, viz. people tend to treat certain members of a category as more representative of the category than other members (cf. Lakoff 1987). The notion of prototypicality is important in dealing with the conceptual relationships between processes and participants since the conceptual frames of processes specify the categories of their presupposed participants. Only by regarding the categories as prototypes or as containing prototypical members can we solve the problem of metaphorical uses. Moreover, prototype theory can account for the phenomenon that birds fly does not preclude the fact that penguins do not fly since they are the non-prototypical members of BIRD (See 6.4 for details).

In order to show the prototype effects of human cognition, information should be organized in such a way that the prototypical instances and non-prototypical instances are distinguished although they form a continuum, with no boundaries in-between. In the dictionary of Chinese, the prototypical instances of a category can be arranged at the top of the entries of the category, while the non-prototypical ones can be placed further away from the prototypical ones, i.e. at the bottom, with the intermediate cases in-between. For instance, the category BIRD in Chinese has such
prototypical instances as SPARROW, SWALLOW, CROW, MAGPIE, etc. The non-prototypical instances of BIRD are PENGUIN, BAT, etc. Somewhere in-between there are instances like CHICKEN, DUCK, and so on. However, this would be in conflict with what has been asserted before, that is, entries with specification of both supercategories and subcategories can be arranged alphabetically. The alternative would be to use a symbol to mark each non-prototypical member of the category. Thus, part of the dictionary that is concerned with category of BIRD would be as follows:

BIRD
SUP: ANIMAL, ...
SUB: SPARROW, SWALLOW, ...
CL: nǐāo
...
SPARROW
SUP: BIRD
CL: máquè

SWALLOW
SUP: BIRD
CL: yànzi
...

CHICKEN
SUP: BIRD
CL: jī

DUCK
SUP: BIRD
CL: yā
...

PENGUIN
SUP: BIRD(Non-P)
CL: qī'ér

BAT
SUP: BIRD(Non-P)
CL: bānfü
Finally, new information can be added to this formulation at any time to reflect the dynamic nature of linguistic knowledge, if this system is stored in a flexible medium such as computer. For example, if a participant is found to be related to another category, this new relation can be shown by adding a new supercategory to the entry of the participant. Moreover, new entries of participants can be entered with specifications of their supercategories and subcategories. In some cases where the part-whole relation is applicable, the constituent and components of a participants are also displayed. The formulaic notions thus facilitate the updating of information in the Chinese conceptual dictionary.

Even when the system does not contain information about a participant, if it is implemented on a computer, it can ask the user to provide such information. For instance, if a concept denoting a participant BOOK is not found in the dictionary, the system can ask 'is BOOK a participant or a process?'. After it is given the information that BOOK is a participant, the system will then ask about its supercategories and subcategories. Consequently, an entry representing a notion and its relationships to other categories is built for a particular participant. Clearly, information organized this way has some advantage in keeping the system open to any modification and adaptation of the knowledge represented therein.

5.2 The Organization of Information about Processes
The general structure of the dictionary for the categories and hierarchies of processes in Chinese is similar to that of participants. However, owing to the peculiarities of processes, there are several prominent differences which need to be spelt out. On the one hand, details of their usage can be specified along with their conceptual frames, which include information about their co-occurrence with participants. As discussed in 4.1, processes can be divided into four major classes. These major categories can be further subclassified according to some semantic-conceptual criteria, e.g. the processes of State prototypically comprise subcategories such as Relational, Quality, Existential, Possession, etc. For example, Existential processes express the idea that something exists, and the Mental Status processes signal the mental status of human beings, while mental Action processes signify mental activities. In addition, the subcategories may indicate the conceptual relationships between processes and participants. For instance, Causation Event processes have as first participant the causer and as second participant the causee. For the Affective Action processes, the first participant is the performer of the action, while the second participant is affected by the action. Theoretically, this subcategorization can go still further and results in smaller groups of processes. However, the number of levels as shown in Appendix 2 are sufficient to display the conceptual differences between
different groups in general and the conceptual similarity within a group in particular since more delicate and subtle distinctions among the processes of a group can be demonstrated by the conceptual frames attached to the processes.

Unlike participants, processes less often have lexemic realizations of some categories at higher levels, although at lower levels, most processes have both lexemic realizations and subcategories. In spite of the fact that the process DO can be said to be the highest category of Action processes, it is not clear whether the subcategories of Action processes have simple verbs as realizations. For example, EAT is a process and at the same time a supercategory of DEVOUR which denotes a special type of eating. Moreover, EAT itself is a subcategory of INGEST which can serve as the name of the supercategory as well as a process. However, it is difficult to find a supercategory for INGEST. The group in which INGEST belongs has the name Affective which is not a process in Chinese. Therefore, entries for processes are arranged in groups with a semantic label attached to the front. Thus, information about processes is organized in such a way that the supercategories and subcategories will be provided, whenever they are explicit. If processes do not have an explicit supercategory or subcategory, then the supercategories and subcategories will not be specified in the entries. In addition, as discussed before, EAT has CHEW and
SWALLOW, etc. as its components and there is a part-whole relation existing among them. This type of information is also provided in the entries for processes. Thus, part of the dictionary for Action processes is as follows:

Affective:

... 

tī 'to kick'
SUP: DO

shèrù 'to ingest'
SUB: EAT, DRINK, ...

chī 'to eat'
SUP: INGEST
SUB: DEVOUR
COMPONENTS: CHEW, SWALLOW

jiāo 'to chew'
CONSTITUTE: EAT

yàn 'to swallow'
CONSTITUTE: EAT

hē 'to drink'
SUP: INGEST
SUB: SIP

mǐn 'to sip'
SUP: DRINK

Furthermore, conceptual frames which indicate the type of participants that processes presuppose and the unmarked order of their actual realization at the lexicemic level are provided in the entries of processes. The reason is two-fold. For one thing, there are, in any language, a lot more participants than processes. Consequently, it is not practically feasible to specify the processes in the entries of participants although in theory participants can contain information about
what processes they cooccur with since they are dependent of
each other. For example, a human participant in Chinese like
GUEST can occur as the participant of most processes. Thus,
it is more tedious to list all the processes which this
participant requires in its entry in the dictionary. In
contrast, the placement of the conceptual frames in the
processes reduces the amount of specification without losing
the necessary information since what is provided is the
categories of participants. For instance, the process EAT
requires the first participant to be almost any participant
that falls into the Animate category and the second
participant to be any participant which belongs the
categories: Living, Food, Medicine, etc. Thus, it is more
practical to include the information in the conceptual frame
of EAT than attach EAT to all the participants that fit those
categories.

For another thing, the meaning of processes is, in
general, not as explicit as that of participants. That is, a
participant by itself has a meaning more concrete than a
process does. Thus, the speakers of Chinese understand a
participant without looking at the processes they occur in.
However, they cannot fully understand a process without taking
the participants which it presupposes into consideration. For
example, Chinese users know what huǒ 'fire' and háizi 'child'
mean. But they may not know what exactly SAVE signals until
they are presented with the information about the participants
that follow SAVE. When FIRE follows SAVE, the combination means 'to relieve or put out a fire', whereas if CHILD follows SAVE, the whole unit means 'to save the life of the child'.

Furthermore, Gruber (1965) and Chafe (1970), as shown in 2.1, all assert that verb is the central element that determines the noun-verb relations. Gruber does not explicitly give reasons for this. Chafe offers three reasons: a) the verb is present semantically in all sentences; b) the verb determines what nouns will accompany it, for instance, in the sentence 'the chair laughed', the verb requires that the noun be interpreted as the actor of laughing; 3) inflectional units, like Past, which are added to the verb, are added simultaneously to the entire sentence (Chafe 1970:96). Teng (1975) follows Chafe's line of reasoning by arguing that the generation of semantic structures has to be controlled by verbs. Obviously, these arguments are not psychological evidence for their claims. Thus, they may have arrived at a correct conclusion, but only through non-cognitive evidence. In our view, verbs are only the morphological forms or lexemic realizations of concepts which signal processes at the conceptual level. A morphological or lexemic verb may be the realization of several different conceptual processes. What process the verb actually realizes depends on the participants that cooccur with the process. Accordingly, conceptual frames which indicate the required participants of a processes are
provided in the entries of processes rather than in the entries of participants.

With all the information about the conceptual frames, part of the dictionary for Action processes which has been discussed earlier in this section would have the following structure:

**Affective:**

...  

\[ \text{tī 'to kick'} \]
\[ \text{KICK <ANIMATE:X CONCRETE:Y>} \]
\[ \text{R(X) tī R(Y)} \]
\[ \text{SUP: DO} \]

\[ \text{shèqū 'to take in'} \]
\[ \text{TAKE - IN / INGEST < ANIMATE : (FOOD, MEDICINE, MATERIAL):Y>} \]
\[ \text{R(X) shèqū R(Y)} \]
\[ \text{SUB: EAT, DRINK, ...} \]

\[ \text{chī 'to eat'} \]
\[ \text{EAT <ANIMATE:X (PLANT, ANIMAL, FOOD, MEDICINE):Y>} \]
\[ \text{R(X) chī R(Y)} \]
\[ \text{SUP: INGEST} \]
\[ \text{SUB: DEVOUR} \]
\[ \text{COMPONENTS: CHEW, SWALLOW} \]

\[ \text{jiáó 'to chew'} \]
\[ \text{CHEW -- EAT} \]
\[ \text{CONSTITUTE: EAT} \]

\[ \text{yàn 'to swallow'} \]
\[ \text{SWALLOW -- EAT} \]
\[ \text{CONSTITUTE: EAT} \]

\[ \text{tūn 'to devour'} \]
\[ \text{DEVOUR -- EAT} \]
\[ \text{SUP: EAT} \]

\[ \text{hē 'to drink'} \]
\[ \text{DRINK < ANIMATE: X} \]
\[ \text{((WATER/shuí), SOUP, BEVERAGE, WINE):Y>} \]
\[ \text{R(X) hē R(Y)} \]
\[ \text{SUP: INGEST} \]
\[ \text{SUB: SIP} \]
5.3 The Lexical Entries of Processes

As shown in the previous section, it is better to put information about participants presupposed in the entries of processes. This information exists in the form of conceptual frames of the processes. entries for processes contain more than the conceptual frames. In fact, the lexical entries of processes also indicate the word order of the lexical realization of both processes and participants. In addition, analogical and pragmatic information are also provided. In this sense, an entry in the conceptual dictionary for participants and processes represents, according to our metaphor, a notion which is exhibited by the form and meaning of a process or participant, and its connections with other notions which are exemplified by the categories, hierarchies and conceptual frames.

The categories and hierarchies of processes and participants have been already discussed at length in the previous sections. Consequently, information which is conveyed by the conceptual frames will be examined exclusively in this section. First, the conceptual frames reveal the kinds of participants a process presupposes. Some processes like BE-TIRED and COLLAPSE requires only one participants. Others like HIT and GIVE need two or more participants. What
is given in the conceptual frames is, however, the categories of participants since the instances of the categories are too numerous to list. For example, the natural behavior process FALL takes dàyuǐ 'heavy rain', xiǎoyǔ 'small rain', máomaoyuǐ 'drizzle', léizhènyǔ 'thunderstorm', or zhènyǔ 'shower' as its participant. In addition, it also cooccurs with any instance of SNOW, FOG, FROST and HAILSTONE. Consequently, it is practically not feasible to include all the instances, but the categories. In the case of FALL, its conceptual frame contains only five categories rather than a huge number of instances, as shown below:

xià 'to fall'
FALL <(RAIN,SNOW,FOG,FROST,HAILSTONE):X>

As discussed in 4.2, Chinese speakers have knowledge about the marked and the unmarked order of the lexical realizations of the process and participant(s) in a clause. This information about the unmarked order is also reflected in the lexical entry of a process. Since the marked order is derived from the unmarked and is quite regular, it is not included in the conceptual frames, but in the form of some general rules in the grammar. The symbol 'R' is employed to indicate the linguistic realization of the instance of the semantic concept, i.e. the participant. For example, the unmarked order for BORROW starts with R(X), which means the first participant is an instance of either Human or Institution. It could be Yuēhān 'John', tā de lǎoshi 'his teacher', zhèngfǔ 'the government' or wǒ de gōngsī 'my
company'. The process in lower case indicates its morphological realization, which means the process that has the semantic import 'BORROW' is morphologically realized as jiè in Chinese. Following jiè is R(Y) which signals that the second participant can be the linguistic realization of any of the semantic categories under CONCRETE except instances of CELESTIAL-BODY. Thus, part of the lexical entry for BORROW which shows the unmarked order is one more line added to the entry:

R(X) jiè R(Y)

In 4.3, it is argued that Chinese users also know the proper cultural or social context in which a process is used. The information about such contexts is, in this study, referred to as the pragmatic knowledge which is also represented in the lexical entry of processes. There are several parameters used to indicate such contexts: Formal, Honorific, Sympathetic, Polite, etc. The list is actually open for expansion whenever necessary. Actually, the processes with these marks are the marked ones, that is, they occur only in these special contexts. In contrast, those which are of general use without special pragmatic functions are not marked. These parameters in the entries of processes are preceded by the reverse slash '\' which stands for 'in the context of'. As an example, consider:

kāi 'to drive/run'
DRIVE/ RUN <HUMAN:X (MACHINE, VEHICLE):Y>
R(X) kāi R(Y)
jiàshǐ 'to drive'
DRIVE <HUMAN:X VEHICLES:Y>\Formal
R(X) jiàshǐ R(Y)

In addition to their difference in the categories of participant they take, kāi 'to drive/run' and jiàshǐ 'to drive' also differ in that the former can appear in any type of text, while the latter is restricted to formal register only.

Furthermore, Chinese speakers do not obtain the knowledge about the language through memorizing all the detailed information of every entry of processes and participants. As argued in 2.6, human beings learn things through analogy, i.e. they tend to look for the similarity between things and apply knowledge about one process to another based on their similarity. Therefore, it is likely that Chinese speakers acquire the information about the conceptual frame of one process by looking at a similar process. For example, if the user already knows the conceptual frame of BORROW, he will find RETURN is very similar to BORROW. Then, the information about RETURN in the speaker's conceptual system is structured in the same way as BORROW. Thus, a relation between BORROW and RETURN can be established. Likewise, the speaker possesses the knowledge that BUY has more or less the same conceptual frame as SELL. In this case, the symbol '->' which means 'having the same categories of participants as' is used. Accordingly, the entries for BUY, SELL, BORROW and RETURN will be constructed as below:
Transaction:

... 

mǎi 'to buy'
BUY <(HUMAN, INSTITUTION):X CONCRETE:Y>
R(X) mǎi R(Y)

mài 'to sell'
SELL --> BUY 

...

Transfer:

...

jiè 'to borrow'
BORROW <(HUMAN, INSTITUTION):X CONCRETE!CELESTIAL+
SPOKEN-DISCOURSE:Y>
R(X) jiè R(Y)

huán 'to return'
RETURN --> BORROW

...

5.4 Multiple Frames

A problem facing the construction of the conceptual dictionary for Chinese is that many lexical verbs can represent more than one conceptual process, e.g. tui can signal RETREAT, QUIT, 'REFUND', 'RECEDE', 'CANCEL', etc. Conversely, a conceptual process can have more than one lexical form, e.g. dīng, zhūshì, níngshì, etc. can all signify GAZE. These phenomena are traditionally treated as homonymy and polysemy by linguists and lexicographers. According to Lyons (1977), homonymy means that two or more lexical items have the same morphological or graphic shape but different senses, e.g. 'port' (harbor) and 'port' (kind of fortified wine). In contrast, polysemy designates the fact that one
lexeme with several different senses, as in 'mouth' (organ of body) and 'mouth' (entrance of cave). To distinguish the two types, the criterion of relatedness in meaning is often invoked. The problem with this criterion, as Lyons (1977:552) points out, is that relatedness appears to be a matter of degree. The latter phenomenon is conventionally regarded as synonymy which means that lexical items of different shape have the same or similar meaning. The problem with the latter is that most synonyms are just similar in meaning but not the same. Moreover, they tend to occur in different contexts. We will not get into the debate here, but will attempt to treat these phenomena with the cognitive approach as defined in our study.

Recall that cognitive linguistics treats a linguistic system as having multiple layers, at least three strata: phonemic, lexical and conceptual (Lamb 1991a). The relationships between a higher level and a lower one is that of realization. Thus, lexemes, in this line of reasoning, are just realizations of concepts, or vice versa, concepts are realized by lexemes. Accordingly, it is meaningless, in the view of cognitive linguistics, to talk about homonymy and polysemy without looking at the relationships between the two strata: lexical and conceptual. Consequently, homonymy is the phenomenon in which more than one concept is realized by a single lexical form, while polysemy is one in which a concept is metaphorically extended. Following Lyons (1977), cognitive
linguistic also regards the difference as a matter of degree since it is hard to draw the line between a metaphor and a different concept. However, it is at least more explicit to account for the problems mentioned at the beginning of this section with the realization theory. In the case of tui, it is a lexical unit which is the realization of more than one concept. On the other hand, the concept GAZE in Chinese has more than one realization: ding, zhushi, ningshi, etc.

Although it has been argued that the mapping between concepts and lexemes is not a one-to-one correspondence and the best way to account for it is to invoke the notion of realization, there are still some practical problems when one starts to construct the conceptual frames for processes in Chinese. First, when a lexical verb represents more than one process, the meaning, i.e. the concept at the conceptual level, of processes are in fact determined by the participant(s) they take. Let us take tui as the example. When it takes only one participant and the participant falls into the semantic category of Human, it is the realization of the concept RETREAT:

(1) Dirén tui le
    enemy retreat LE
    'The enemies retreated.'

But if the participant is a nonliving thing, it is the realization of the concept RECEDE/EBB:

(2) Dháoshuǐ tui le
    tide recede LE
    'The tide ebbed.'
Clearly, the relatedness between the concepts 'retreat' and 'recede' can still be traced since both of them involve the meaning of 'moving back'. It may be said that one is the metaphorical extension of the other. However, other cases are not so obvious. For example, when the process has two participants, with the first one being Human and the second Object, it means 'to give back or to refund':

(3) Tā tui le huǒchē piào
    he refund LE train ticket
    'He refunded his ticket.'

But when the second participant is ENGAGEMENT, ORDER OF GOODS etc, tui means 'to cancel':

(4) Tā tui hūn le
    he cancel marriage LE
    'He broke off his engagement.'

Are CANCEL and REFUND still related to RETREAT and RECEDE? The extent to which they differ is so great that the relatedness has become unclear in spite of the fact that they may be related in some way. Thus, it is difficult to treat tui as the realization of one concept.

In our effort to construct a conceptual dictionary for Chinese the above-mentioned factors are taken into consideration. In practice, any semantic information should be included despite of the fact that there is some relatedness between concepts since our model centers on the knowledge of the speakers. The semantic difference between concepts which are realized by the same lexical verb are reflected by assigning more than one conceptual frame to it, that is, some
entries of lexical verbs have multiple conceptual frames. The criterion for determining whether a lexical verb has multi-frames is whether the processes realized by the verb are synonymous given that the participants have the same conceptual categories. If the realization of processes satisfies the criterion, the lexical verb will not be treated as having multiple conceptual frames. For instance, the concept DEVOUR has the following frame:

(5) tūn 'to devour/gulp down'
    DEVO U R / G U L P - D O W N < A N I M A T E : X
    (LIVING, FOOD, MEDICINE):Y>
    R(X) tūn R(Y)

No matter what participant of the same conceptual categories it takes, the concepts it realizes remain the same, i.e. 'to devour' or 'to gulp down':

(6) a. Dà yú tūn xiǎo yú
    big fish devour small fish
    'Big fish devour small fish.'

    b. Tā tūn zhōngyàowán
    he devour Chinese medicine pills
    'He gulps down pills of Chinese medicine.'

Thus, tūn is not considered the realization of two concepts, i.e. two different processes, since the concepts it realizes are synonymous and the conceptual categories of the participants are the same.

If a different category of participants in a conceptual frame for a process results in a different concept which is not synonymous, a separate entry is set up for the lexical verb, as in the case of tui where five different conceptual frames are established:
(7)  

a. tui-1 'to retreat'
RETREAT <HUMAN:X>
R(X) tui

b. tui-2 'to recede/ebb'
RECEDE/EBB <TIDE,FLOOD,FEVER, COLOR):X>
R(X) tui

c. tui-3 'to quit/leave'
QUIT <HUMAN:X INSTITUTION:Y>
R(X) tui R(Y)

d. tui-4 'to refund'
REFUND <HUMAN:X OBJECT:Y>
R(X) tui R(Y)

e. tui-5 'to cancel/break off'
CANCEL/BREAKOFF <HUMAN:X (ENGAGEMENT, ORDER):Y>
R(X) tui R(Y)

The order here resembles the way in which the entries of lexical verbs are usually treated in a dictionary, viz. the foremost in the list is the one that is most frequently used, the ones in the middle are less frequently used, and the hindmost is the least frequently used.

In so doing, we assign different numbers of entries to lexical verbs which are realizations of conceptual processes. Consequently, some may have only one entry, as in GIVE-BIRTH-TO and DRIVE-OUT. Others may have more than one entry, as in ning-1 'to pinch' and ning-2 'to twist'. Still others may have more than ten entries. For instance, the lexical verb dā has as many as 15 entries each of which is a realization of a conceptual process that requires a different conceptual frame. Historically, these different frames of a lexical verb may be related. But here, we focus on the knowledge of the speakers in using them. We believe that they know the categories of
participants involved in different frames and the different concepts which a lexical verb realizes. Accordingly, multiple frames should be established to reflect their knowledge.

The different entries of a lexical verb may belong to various conceptual categories of processes according to the concepts they realize. For example, the first entry of *tùi* is the realization of the process RETREAT, hence coming under the category of human dynamic behavior of the Action group. In contrast, the third entry of *tùi* realizes the concept of QUIT which is classified as one of the cessation processes in the Event group. Moreover, different entries of the same lexical verb, on the other hand, sometimes may fall into the same category. As an example, consider the following sentences which contain the lexical verb dă:

(8)  

a. dă-11 'to engage in'  
   ENGAGE-IN <HUMAN:X ABSTRACT:Y>  
   R(X) dă R(Y)  

b. dă-12 'to play'  
   PLAY <HUMAN:X (GAME,SPORT,MARTIAL-ART):Y>  
   R(X) dă R(Y)  

c. dă-13 'to do'  
   DO <HUMAN:X HUMAN-BEHAVIOR:Y>  
   R(X) dă R(Y)  

All the conceptual frames in (8) have the first participant as human performer of the action, and the second participant specifying the range of activities performed by the first, but not directly acted upon by the performer. Furthermore, all three entries are realizations of a process which expresses an action. Accordingly, they fall into the Goal Action group.
In the case of a process which is realized by more than one lexical form, all the lexical forms will be listed in the same conceptual category of processes. For example, the conceptual process COLLAPSE can be realized by several Chinese lexical verbs:

(9)  

a. Qiáo tā le  
bridge collapse LE  
'The bridge collapsed.'

b. Qiáng yào kuǎ le  
wall will collapse LE  
'The wall is going to collapse.'

c. Dírén wánquán běngkui le  
enemy completely collapse LE  
'The enemy completely collapsed.'

Evidently, tā, kuǎ and běngkui are all realizations of the process 'to collapse'. However, they have conceptual frames which presuppose different categories of participants:

(10)

Event

Occurrence:

tā 'to collapse'  
COLLAPSE <BUILDING:X>  
R(X) tā

kuǎ 'to collapse'  
COLLAPSE <(BUILDING,HUMAN,INSTITUTION,ABSTRACT):X>  
R(X) kuǎ

běngkui 'to collapse'  
COLLAPSE <(HUMAN,ABSTRACT):X>  
R(X) běngkui

Thus, the conceptual frames of the lexical verbs reveal their difference in use. This shows that, for some processes in
Chinese, the speakers have particular information in their conceptual structure to distinguish them.

In addition, different lexical realizations of the same process can be differentiated on the basis of pragmatic knowledge. For example, bēngkuì is only used in formal style, while tā and kuā are employed neutrally. Thus, one purpose of adding pragmatic information is in a measure to tell apart the different lexical realizations of the same conceptual process. Since the specification of pragmatic information has already been discussed in the previous section, we will not repeat it here. The point that needs to be accentuated is that the redundancy, i.e. one process versus multiple lexical realizations, is, as shown above, pragmatically motivated.
Notes to Chapter 5

1. CL stands for 'Chinese lexeme'. But in English glosses of Chinese clauses, it means Classifier (See Abbreviations).

2. The abbreviation 'Non-p' stands for 'Non-prototypical instance'.
Chapter 6

PROTOTYPICALITY AND PARTICIPANTS

In the previous chapters, we have discussed the knowledge which Chinese speakers have about the relationships between processes and participants and the ways in which this knowledge can be structured and organized in the form of a conceptual dictionary. Furthermore, we have also examined the types of information provided in the lexical entries of processes and the necessity of multiple conceptual entries for some lexical verbs in Chinese.

In this chapter, attempts will be made to investigate the specification of participants within the conceptual frames. Particular attention will be paid to the questions of what constitutes a participant and how the participants should be specified in the conceptual frames. The pertinence of the notion of prototypicality will be explored when dealing with the different frames for some processes and the various degrees of restrictedness of participants in conceptual frames.

6.1 What Is a Participant?

When specifying the participants of a conceptual frame, we are faced with the problem of what constitutes the participant(s) of a process. Opinions of most linguists seem to be converging as to what counts as a participant although they tend to use different terminologies. For example, Halliday (1967) first correlates participants with certain
syntactic categories: for transitive verbs, the participants are realized as the subject and the complement; for intransitive verbs, the participant is the subject. In addition, there are attributes and circumstances which function as complements, but not participants. But, syntactic parameters are not sufficient to differentiate participants from attributes and circumstances. Halliday (1967) thus introduces semantic roles as additional criteria. According to him, if a transitive verb has a subject with a semantic role of 'actor' and an object with a semantic role of 'goal', then they are considered the participants. Moreover, the subject of a causative clause like the sergeant marched the soldiers plays the role of initiator, and is hence a participant. He adds that the semantic roles of beneficiary and range also define participants. This seems to suggest that indirect object also reflects a participant. Later (1985), he points out that the subject and object of some clauses semantically function as behaver, senser, sayer, target, existent, etc. Thus, they are all participants of some processes.

In a similar fashion, Dixon (1979) examines the 'semantico-syntactic roles' across languages though he does not use the term 'participant', but 'argument' instead. According to him (1979:), there are four major types of such roles: A, O, S\(_a\) and S\(_o\), which are associated with arguments. He defines A as the most agent-like argument and O as the next
agent-like argument. S includes all the unique core arguments of single-argument clauses. He states that $S_a$ arguments are those S arguments which exercise volition and control over the event expressed by the verb, e.g. 'John' in John ran. In contrast, the $S_o$ arguments do not exert such volition and control, e.g. 'John' in John died (cf. Payne 1985).

Hopper and Thompson (1980) declare that they follow Dixon (1979), but with the term 'participant' instead of 'argument'. For instance, they argue that a sentence may have a subject or both a subject and an object, with the subject being the agent of the action and the object the patient (receiver) of the action. Accordingly, the subject and the object comprise the participants of the event expressed by the action. However, they do not talk about semantic roles such as beneficiary and instrument, etc.¹

Payne (1985:22), also using the term 'participant' instead of 'argument', states that the former emphasizes the concepts communicated by language rather than the form of linguistic descriptions of those concepts. Payne (1985:21) explicates Dixon's assumptions. He says that the terms A, O, $S_a$ and $S_o$ lay stress on the assumption that the syntactic clause is the relevant unit of structure within which linguistic primes can be isolated. Thus, this assumption is consistent with the view that the clause is the concrete linguistic expression of the discourse scene (cf. Fillmore 1977). Furthermore, Payne claims that these terms presuppose
that clauses have core arguments\textsuperscript{2} and peripheral arguments. He believes that his claim is consistent with the notion that a language user can only attend to a very limited amount of information at a time (cf. Chafe 1980). He goes on to assert that many participants may be on stage, but it is an empirical observation across languages that at most three participants can be in perspective at once (1985:21). According to him, core arguments are traditionally termed subjects, objects and indirect objects, while peripheral arguments are in the oblique cases. Finally, he (1985:21) concludes that Dixon's terms assume the existence of two prototypical clause types, those with one core argument and those with more than one core argument, traditionally referred to as intransitive and transitive, respectively.

Davis (1991) also associates participants with 'roles' and syntactic categories such as 'subject' and 'object'. He claims that the roles are event-participant relations. According to him (1991:219), all languages will identify some participants as filling 'roles' and at the same time will identify some as not filling roles. However, the ways various languages do so vary. For example, the number of the event-participant relations varies from language to language as does their character, but every language exhibits at least two. Moreover, all languages will select one of the participants filling one of the roles for special treatment since it is more central to the event, hence joining with it as the
nucleus of the proposition. He goes on to demonstrate that if a language, e.g. Tongan which is a typical ergative language, has a minimum of two types of event-participant relation, it tends to distinguish between the executor and the experiencer by the ergative case marking, with the executor always being the subject of a clause, whether transitive or intransitive, while the experiencer may be the subject of an intransitive clause or the object of a transitive clause. Other languages with three-term system like Japanese, i.e. executor vs. non-executor vs. experiencer, may have more variation on the 'goal' or 'object' side than on the 'agent' or 'subject' side. Some languages will take the direct object as the experiencer, while others take the indirect object as the experiencer (Davis 1991:246).

Langacker (1987b) advances what he calls a cognitive model of clause structure. According to him (1987b:383), the participant interactions of a canonical action assume the form of an action chain leading from an agentive source, through a possible intermediary with instrumental function, to an energy sink which undergoes a resultant change of state. This characterization is very similar to Hopper and Thompson's (1980) description of a typical transitive clause. Furthermore, Langacker (1987b:384) claims that a finite clause prototypically profiles an action construed as constituting an event, with the agentive source coded as the clausal subject, and the energy sink as direct object. Thus, the agent and
patient roles serve as prototypes for these central grammatical relations. In contrast, locations and non-central participants (e.g. instruments) are generally coded by noun phrases explicitly marked as oblique. However, as he notes, not every situation described by a finite clause conforms to the archetype; that is, a situation need not to be construed or coded linguistically in the maximally unmarked fashion. For example, in English the subject can be an instrument or an inanimate force rather than an agent, while the object is allowed to be a mover or an experiencer rather than a patient undergoing a change of state (Langacker 1987b:384):

(1)  
   a. This knife won't cut the salami  
   b. The wind blew the leaves about  
   c. Tommy tickled his new secretary

To accommodate these prototypical and non-prototypical instances, Langacker (1987b) proposes to characterize a subject as the head and a direct object as the tail in an action chain, hence the subject is the participant farthest upstream in the flow of energy, whereas a direct object is the participant farthest downstream.

As shown above, participants have been characterized on the basis of two parameters: syntactic functions and semantic roles. On the one hand, the major participants of a process are realized as some syntactic units, e.g. Subject, Object, Indirect Object, etc. On the other hand, they fill conceptual roles which indicate the event-participant relations, e.g. Agent, Goal, Executor, Experiencer, Beneficiary, etc.
Moreover, most of the linguists accentuate that languages tend to treat no more than three participants as the central syntactic elements in a clause at a time. The major difference among them is that some linguists like Halliday (1985) do not regard instrument and the like, which are normally realized by a prepositional phrase, i.e. it is in the oblique case as a participant. Others like Langacker (1987b) and Payne (1987) believe that things like instrument constitute participants, though not central ones. Furthermore, different languages may resort to different ways of treating participants in their grammar. For example, as Davis (1991) explicitly demonstrates, Tongan syntactically does not allow the indirect object but instead expresses the beneficiary participant by a prepositional phrase, while other languages like Bella Coola do not grammatically recognize the indirect object and the direct object in the same clause. If ever both the patient and the beneficiary are to be expressed, the former has to be realized in the form of a prepositional phrase.

Following the theories outlined above, we begin to examine the Chinese data collected for this study. It is found that Chinese does not behave like either Tongan or Bella Coola, i.e. it includes up to three participants as the elements of a clause marked by position only. In other words, if the patient and the beneficiary or recipient are present, Chinese sometimes syntactically recognizes them as
the indirect object and the direct object, i.e. without coding them with prepositional phrases:

(2) a. Tā gěi wǒ yì běn shū
   he give I one CL book
   'He gave me a book.'

   b. Zhāngsān jiè Lǐsī yì běn shū
   Z.S. borrow L.S. one CL book
   'Z.S. borrowed a book from L.S.'

However, as with other languages which allow up to three positionally marked participants, this is restricted to a limited number of processes. For example, Chinese does not syntactically recognize the indirect object in clauses which contain the lexical realizations of processes like BUY and SELL; for them, the beneficiary has to be coded with prepositional phrases:

(3) a. Tā gěi wǒ mǎi le yì běn shū
   he for I buy LE one CL book
   'He bought me a book.'

   b. Xiǎo Wáng mài gěi wǒ yǐ liàng chē
   X.W. sell to I one CL car
   'X.W. sold me a car.'

Conversely, English, as the gloss in (3) shows, can treat the beneficiary as a positionally marked component, not realized by a prepositional phrase. From these examples, it can be concluded that as a general theory only those positionally marked participants are important as the components of the conceptual frames in that they provide vital information about the relationships between the processes and the participants. What needs to be specified in the conceptual frames are just the central participants presupposed by a process, and the
relationships between processes and the peripheral participants are explicitly expressed by the markers, in the case of Chinese, by prepositions. Usually, therefore, the participants presupposed as central are the ones marked by position. But this is not always so. For example, the process BUY inherently requires at least five participants: the buyer, the thing bought, the beneficiary, the money spent and the location. But Chinese syntactically only recognizes the buyer and the thing bought, that is to say, they are the positionally marked participants, while all other participants are realized as overtly marked elements, i.e. with prepositions:

(4) Tā zài Houston huā sān kuài qián gěi tā
he in Houston for three CL money to he
mǎi le yī běn shū
buy LE one CL book
'He bought him a book for three dollars in Houston.'

Since only the buyer and the thing bought are positionally marked, we need to specify them in the conceptual frame for BUY in Chinese. Other participants can be treated as the peripheral participants because their roles, i.e. the seller, the money spent and the location, are indicated by the prepositions huā, gěi and zài, respectively.

In the case of clauses where three participants are syntactically recognized, as shown in (2), the beneficiary can sometimes be marked with prepositions, too. However, the discourse function performed by this marked participant is
different from that performed by the unmarked beneficiary. As an example, consider:

(5) Tā gěi le yī běn shū gěi wǒ
he give LE one CL book to I
'He gave a book to me.'

Clearly, (5) with a marked beneficiary emphasizes the person who received the book since the corresponding question for (5) is (6a), while (2a) with an unmarked beneficiary stresses on the thing that was given since the corresponding question for (2a) is (6b):

(6) a. Tā gěi le yī běn shū gěi shéi
he give LE one CL book to who
'He gave a book to whom?'

b. Tā gěi le nǐ shěmme
he give LE you what
'What did he give you?'

Evidently, the unmarked beneficiary in (2a) only serves as the old information that is given in the discourse, whereas the marked beneficiary in (5) functions as the new information which is not known in the context.

In a similar way, prepositions like bèi 'by' and bǎ mark the agent and the patient of the process, respectively. However, the discourse functions of nominals marked by bèi and bǎ are different from that by gěi. For example, the function of a bèi phrase is to denote the demoted agent and put the patient in focus, hence the prototypical marker of a passive construction.6 In contrast, the discourse function of the phrase marked by bǎ is to signal that the patient is the given
information and the process is the new information (See 1.1 and 4.2 for details). Compare:

(7)  
   a. Tā bèi Zhan san dǎ le  
       he by Z.S. hit LE  
       'He was hit by Z.S.'

   b. Tā bā Zhan san dǎ le  
       he BA Z.S. hit LE  
       'He hit Z.S.'

Note that the agent marked by bèi in (7a) can be the new information since the patient has been preposed as the given information, while the patient marked by bā in (7b) becomes the given information since the new information is dǎ. On the other hand, the unmarked version of (7) is (8) in which the new information is Zhangsan or dǎ le Zhangsan, i.e. the processes and/or the patient:

(8)  
    Tā dǎ le Zhangsan  
    he hit LE Z.S.  
    'He hit Zhangsan.'

Following this line of reasoning, we believe that only the positionally marked participants need to be provided in the conceptual frames as part of the knowledge of Chinese speakers since the roles of marked participants are demonstrated by the prepositions and the conceptual structure of prepositions is included in the conceptual dictionary of Chinese (See 3.2 and Li 1972 for his treatment of Chinese prepositions as case markers). In this connection, prepositions presuppose participants, too. Their function is to relate peripheral participants to the process, or in addition to signal the discourse functions of those
participants, as shown above. Thus, in the lexicon, a separate section should be devoted to prepositions. In the Chinese dictionary which we set out to construct, prepositions should be grouped according to the participant roles which they mark and the discourse functions which the marked participants may perform, as shown in Figure 1 (See Part II of this study for more detailed information about Chinese prepositions).

AT/IN <Location:PLACE:X>
   zài R(X)

WITH <Instrument:CONCRETE:X>
   vòng R(X)

WITH <Instrument:(TIME,MONEY):X>\n   huā R(X)

BY <Agent:THING:X>/Demoted
   bèi R(X)

<Patient:THING:X>/Given
   bǎ R(X)

FOR <Beneficiary:THING:X>
   wèi R(X)
   gěi --> wèi

FROM <Source:(HUMAN,INSTITUTION,PLACE):X>
   cóng R(X)

TO <Recipient:HUMAN:X>
   gěi R(X)

WITH <Accompaniment:HUMAN:X>
   hé R(X)
   tóng --> hé

Figure 1
The Conceptual Structure of Chinese Prepositions

Having differentiated the positionally marked participants from the ones marked by prepositions, we are in a
better position to decide what type of information about the participants needs to be provided in the conceptual frames for Chinese processes. It is clear that the semantic roles and discourse functions of those prepositionally marked participants of processes are in part evident through the use of prepositions. Thus, Chinese speakers can rely on their knowledge of prepositions to understand the relations of marked participants to processes. In other words, only the positionally marked participants of a process need to be specified in a conceptual frame. Accordingly, there are three types of conceptual frames on the basis of the number of positionally marked participants: the conceptual frames of some processes contain three positionally marked participants; some contain just two positionally marked participants; others contain just one positionally marked participants.

6.2 Circumstantials and Participants
As noted in 2.1 and above, Halliday (1985) is ambivalent in maintaining the distinction between the participants and the circumstantial elements of a clause, for there is no simple diagnostic criterion for deciding the cases. Actually, this issue remains controversial since the line between circumstantial and participant is not sharp. Some solutions have been proposed. For example, Halliday (1985) characterizes circumstantial elements as being realized by adverbials or prepositional phrases. However, he finds some exceptions, i.e. some prepositional phrases serve as
participants rather than circumstancials, particularly those preceded by to, by, for, on and in, as in:

(9) a. The children were frightened by a ghost
(mental:Phenomenon)
b. Charge it to the firm
(relation:Beneficiary)

Note that Halliday has to rely on the semantic roles to determine whether a prepositional phrase is a participant or circumstantial. Thus, the criterion is not so much formal as semantic. According to Halliday (1985:), only directly and indirectly involved elements can be the participants of a process. They include actor, goal, behaver, senser, phenomenon, sayer, token, value, existent, beneficiary, range, etc. Halliday here seems to suggest that processes that are realized by intransitive verbs have one directly involved participant, while those realized by transitive verbs take two directly involved participants. Accordingly, in Halliday's (1985) system, things like location, time, instrument, and so on are not considered participants, but circumstancials which are believed to be optional.

There are at least two remaining problems with Halliday's solution. For one thing, an instrument is indirectly involved if not directly involved, as in He was killed with a gun, but he does not consider it as a participant. For another thing, circumstancials are not optional in some cases, as in She is in Australia. The prepositional phrase in Australia signals a location. Nevertheless, it is a necessary component since the clause would not have any meaning without it. To rescue
this exception, Halliday (1985:120) notes that in this case, the circumstance takes the form of a relationship between two identities: one entity is being related to the another by a feature of time or place or manner, hence the circumstance can be a participant. If, however, we are to examine a clause like *The cat is lying on the mat*, we would find that although *lie* is not a relational process, it still relates one entity *cat* to the *mat* which is a place. We are not sure if the *mat* is indirectly or directly involved and if the phrase on the *mat* is optional, that is, it may be optional syntactically, but not optional in this context.

Halliday (1985) notices another type of exception which exists in phrasal verbs like *wait for* and *look at*. The nominal group following them is not a circumstantial but a participant, as in *I was waiting for the boat*. In contrast, the clause *I was waiting on the shore* contains a circumstantial. Halliday (1985:143) employs cleft, pseudo-cleft and topicalization as diagnostic devices for determining the participant:

(10) a. I was waiting on the shore
    i) It was on the shore that I was waiting
    ii) On the shore I was waiting all day
    iii) Where I was waiting was on the shore

b. I was waiting for the boat
    i) It was the boat that I was waiting for
    ii) The boat I was waiting for all day
    iii) What I was waiting for was the boat

However, the prepositional phrases in both can be left out, hence optional according to Halliday's (1985) definition.
Accordingly, they both ought to be circumstantial. Yet Halliday (1985) treats the boat as a participant since wait for semantically behaves like one unit and consequently (10b) behaves differently in those tests. Furthermore, clauses like He works for me and He looks for me would behave differently in the tests:

(11) a. He works for me
   i) It is for me that he works

b. He looks for me
   i) It is me that he looks for

Thus, according to Example (10), for me in (11a) should be a circumstantial while me in (11b) should be a participant. However, the pronoun me in (11) designates semantically either an indirectly involved element, i.e. beneficiary or a directly involved element, i.e. goal, hence a participant. If, on the other hand, the optional criterion is maintained, me in (11a) would be a circumstantial whereas me in (11b) would be a participant. These examples show that it is very difficult to distinguish between participants and circumstantial. Therefore, Halliday (1985:144) states that the distinction between participants and circumstances is becoming increasingly blurred in modern English. Clearly, the problem with Halliday's characterization is that he tries to form a general rule to distinguish circumstantial from participants. However, individual processes tend to have different requirements of participants. Some processes do presuppose circumstantial as their participants, e.g. the process RETURN
in Chinese takes a location as its second participant. Thus, the conceptual frames of individual processes vary, which conforms to our assumption that each concept has its own syntax of combining with its participants.

Langacker (1987b) holds a similar view to that of Halliday (1985). For example, as shown in the previous section, he seems to include the instrument as a participant, without using the term 'circumstance', but 'setting' and 'location'. In his system, any canonical action is cognitively construed as involving the energetic interaction of discrete, mobile participants within a stable and inclusive setting, any fragment of which can be regarded as a location. Participants not only occupy locations, but they interact with each other through physical contact and the consequent transmission of energy (Langacker 1978b:383). In the unmarked coding of a canonical action, location and non-central participants like instruments are marked as oblique by prepositions. However, he (1987b:386) argues that the distinction between setting and participants is not imposed by objective factors, but depends instead on how a speaker conceives and portrays a given situation. For example, a speaker can treat the counter either as a location or a participant (Langacker 1987b:386):

(13) a. He sliced a salami on the counter. (Location)
    b. The sharp knife marred the counter. (Participant)

(14) a. Everything is peaceful in the countryside. (Setting)
b. The napalm bombs scorched the countryside.
(Participant)

Nevertheless, he notes (1987b:385) that a direct object must be construed as a participant rather than a setting or location. This seems to be contradictory to his earlier claim that there is no objective criterion. Furthermore, he argues (1987b:387) that there is no reason to expect that a location will invariably be marked as oblique, especially when its non-participant character is readily apparent. Since only participants qualify as direct objects, it is possible for a clause with two non-oblique nominal complements to be intransitive, as illustrated by the following example in Classical Nahuatl (Langacker 1987b:388):

(15) ne?waatl in aaltepeetl ni-ya-?
    I ART town I-go-PAST
  'I went to (the) town.'

Langacker notes that in aaltepeetl is not marked as oblique. Yet the clause is clearly intransitive: if in aaltepeetl were a direct object, it would be cross-referenced by an object prefix on the verb.

Putting aside the question of the validity of Langacker's (1987b) characterization of participants and setting/location, we find that his approach is not amenable to Chinese since Chinese does not have things like object prefixes. Moreover, Langacker does not touch upon the time element of a clause. We believe that any plausible approach to the division of participants and circumstances (or 'setting' in Langacker's term) should, as does Halliday's (1985), include the temporal
aspect of an event. Like Halliday, Langacker is not consistent in defining participants and settings although he points out, rightly, that the distinction between participants and settings depends on how a speaker conceives and portrays a situation. However, he is ambivalent since he sometimes looks at participants and settings as syntactic entities, e.g. he at one place says that a location is marked as the oblique, and sometimes treats them as semantic concepts, e.g. at another place he says a location may not be marked as oblique, hence only semantically determined.

We think that any language can, if it needs to, provide a consistent way of treating participants and circumstances though, as Davis (1991) demonstrates, it may vary from language to language. In the case of Chinese, we do not treat temporal elements as participants since they in most cases function as modifiers of the event which is the realization of a process. That is to say, any event can cooccur with a temporal expression. Thus, it is a general property of all processes. It does not need to be specified in the conceptual frames of individual processes. Our claim here can be justified by the grammatical phenomena in Chinese. For example, an adverbial of time can occur in the initial, pre-verbal and post-verbal positions. However, temporal elements, cannot be marked with prepositions in any of the positions:

(16) a. Qùnián tā lái guò wǒ jiā
    last year he come GUO my home
    'Last year, he came to my place.'
b. Tā qùnìán lái guó wǒ jiā
   'He came to my place last year.'

   (17) Tā kàn le sān ge xiǎoshí diànyǐng
       'He watched the movie for three hours.'

   The time adverbial in (17) cannot be moved or marked with a
   preposition. In the case of locations, they are typically
   marked with prepositions and occur pre-verbally although some
   exceptions occur.\(^8\) They are not marked with prepositions and
   occur post-verbally only when some processes of movement are
   present or in the context of some processes that presuppose
   both the agent and patient, but the patient is missing, hence
   non-prototypical uses of the processes (Refer to the next
   section for details of non-prototypical frames of processes).

   Compare:

   (18) a. Tā zài Zhōngguó xué Zhōngwén
       'He is learning Chinese in China.'
b. Tā qù Zhōngguó le
   he  go  China   LE
   'He went to China.'

c. Tā chī shītáng
   he  eat  canteen
   'He eats at the canteen.'

Observe that (18a) shows the normal position of the spatial expression in a Chinese clause, i.e. between the subject and the verb. Sentence (18b) contains a process of movement, hence the direction of the movement can occur post-verbally. However, the location can also occur pre-verbally, but marked with a preposition:

   (19) Tā dào Zhōngguó qù le
       he  to  China  go   LE
       'He went to China.'

The process EAT in Chinese prototypically requires two participants, the agent realized by the subject and the patient realized as the object. But a location may be realized as an object when the patient is not present, for if the patient occurs, the location must be preverbal and marked with a preposition:

   (20) Tā zài shītáng chī fàn
       he  at  canteen  eat  food
       'He eats his meal at the canteen.'

Clearly, a location in Chinese is prototypically marked with a preposition. It is not marked with a proposition only for processes of motion or when the process is used non-prototypically. Thus, in cases as shown in (18b) and (18c), the location will be treated as a participant since it is
presupposed by the process, hence no longer an optional element.

As discussed in 6.1, the agent, the patient, the recipient and the beneficiary (for some processes only) normally are not marked with prepositions. If they are, they perform some discourse functions (Refer to 6.1 for details). Therefore, they are central participants. In contrast, the peripheral participants like instrument, location, etc. are normally marked with prepositions. When they are not, they occur in the non-prototypical frames of processes, that is, non-prototypical uses of processes (See next section). On the other hand, temporal expressions in Chinese are in most cases not marked with prepositions no matter what discourse functions they perform. It may be concluded that temporal elements are usually not treated as participants in Chinese since they do not usually occur in non-prototypical uses of processes. The beneficiary is treated sometimes as a peripheral participant (i.e. marked with a preposition) and sometimes as a central participant (i.e. not marked with a preposition (Refer to 6.1 for details). This shows that it is difficult to formulate a general rule to distinguish between circumstantial and participants. The distinction in fact depends on individual processes. That is, some processes require location or temporal elements to be participants, while others may take them as circumstantial. That is the reason why Halliday's and Langacker's attempts have not been
so successful. In our study, we will only focus on the positionally marked participants of some individual processes because they are presupposed in their conceptual frames.

6.3 Prototypical and Non-prototypical Frames

As mentioned in 6.1, Langacker (1987b) proposes a what he calls 'cognitive model' for clause structure. He notes that a prototypical transitive clause involves a subject and an object, with the former being semantically the agent of the event and the latter the patient of the event. However, the actual coding of the clauses describing different situations may not always conform to the prototype, i.e. the subject may denote an instrument or inanimate force, while the object may be an experiencer. Langacker thus refers to this type of non-prototypical instances as 'marked' finite clauses.

After examining the data in Chinese, we find that non-prototypical uses of processes can be identified for many processes in Chinese. This is the reason why Chao (1968) and Zhu (1982) claim that the relations between verbs and their objects in Chinese are not so restricted as in other languages. For example, the prototypical frame for WASH in Chinese is represented as follows:

(21) xǐ 'to wash'
WASH <HUMAN:X (BODY-PART,OBJECT):Y>
R(X) xǐ R(Y)

The first participant usually fills the semantic role of an agent and the second participant semantically functions as the patient that undergoes the event, as shown below:
(22) Tā xǐ yīfu
he wash clothes
'He washes clothes.'

However, the second participant sometimes does not play a role of the patient. Consider:

(23) a. Tā měitiān xǐ liángshuǐ
he every day wash cold water
'He washes (with) cold water every day.'

b. Tā chángchāng xǐ lǐnyù
he often wash shower
'He often takes a shower.'

Clearly, the second participant in both of (23) do not function as either patient or experiencer, but rather as the instrument because the agent does not wash either cold water or shower, but washes himself with cold water or a shower. Thus, the clauses in (23) constitute a non-prototypical use of the process xǐ in Chinese. Unlike Langacker (1987b), we use the term 'non-prototypical' to characterize this type of frames.

Viewed in this perspective, the diversity of relations between processes and participants as suggested by Chao (1968) and Zhu (1982) is described as the non-prototypical uses of processes. Specifically, they are mostly found in the Action processes and occur when the patient is absent or the prototypical frame of the process involves the agent only. As examples, consider:

(24) a. Zāngsān xǐ máobi
Z.S. write brush-pen
'Z.S. writes (with) a brush-pen.'
b. Zhangsan shuí shāfā
  Z.S.      sleep sofa
  'Z.S. sleeps (on) the sofa.'

The process WRITE in (24a) normally requires a patient which has the conceptual category of WRITTEN-DISCOURSE. But here, the second participant is an instrument, hence a non-prototypical use of the process. Accordingly, a non-prototypical frame can be constructed on its basis. On the other hand, the process SLEEP in Chinese prototypically takes one positionally marked participant, i.e. the agent. However, when it has a location as an object, it is a non-prototypical use.

The multiple frames of a process are different from the multiple frames of a lexical verb. The former specify different subprocesses with the difference of one participant role. But, the latter refers to the phenomenon that a lexical verb is the realization of more than one conceptual process. For example, the lexical verb chī in Chinese can be the realization of the concept EAT which prototypically takes two participants, with the first playing the agent role and the second the patient role. This is the prototypical frame for EAT. However, the process EAT can also have some non-prototypical uses, e.g. the second participant can be an instrument or a location, as shown in Chao's (1968) examples in 1.1, repeated here:

(25) a. Tā chī xiǎo wǎn
    he    eat    small bowl
    'He eats (with) the small bowl.'
b. Chī guănzi
   eat restaurant
   'eat (at) a restaurant'

Thus, clauses in (25) warrant non-prototypical frames since their process-participant relationships are different from the prototypical use. In contrast, the multiple frames for a lexical verb do not necessarily involve a difference of participant role on the second participant, but a different conceptual processes. For instance, the lexical verb chī in Chinese can be the realization of several processes such as SUFFER, EAT, ANNIHILATE, etc. correlating with the category of the second participant, as illustrated below:

(26)  a. Tā chī le hěnduō píngguǒ
       he eat LE a lot apple
       'He ate a lot of apples.'

     b. Tā chī le hěnduō kūtou
        he eat LE a lot hardship
        'He suffered a lot.'

     c. Tā chī le wǒ de jū
        he eat LE I DE chariot(one of the pieces in Chinese chess)
        'He took my chariot.'

Observe that different conceptual processes realized by chī have different presupposed patient categories. For example, if chī realizes the process EAT, the patient is FOOD; if chī realizes the process SUFFER, the patient is HARDSHIP; if chī realizes the process WIPE-OUT, the patient is OPPONENT. In all of these cases, the role of the second participant is the patient. This situation contrasts with that of non-prototypical uses of the same process.
Unlike the multiple frames for different processes of a lexical verb, non-prototypical frames are arranged in the same place where its prototypical frame is located. In contrast, multiple frames of a lexical verb may not only belong to different processes but to different categories of processes. Also, the multiple frames of a lexical verb are numbered, whereas different frames of the same process do not have separate numbers. Thus, part of the entries for the lexical verb chi in will be like the following:

\[ (27) \]
\[ \text{chi-1 'to eat'} \]
\[ \text{EAT} <\text{ANIMATE}:X \ (\text{FOOD, PLANT, FRUIT, ANIMAL}):Y> \]
\[ \text{R}(X) \text{ chi } \text{R}(Y) \]

\[ \text{chi-1 'to eat at'} \]
\[ \text{EAT-AT} <\text{HUMAN}:X \ \text{PLACE}:Y> \]
\[ \text{R}(X) \text{ chi } \text{R}(Y) \]

\[ \text{chi-1 'to eat with'} \]
\[ \text{EAT-WITH} <\text{HUMAN}:X \ \text{KITCHEN UTENSILS}:Y> \]
\[ \text{R}(X) \text{ chi } \text{R}(Y) \]

\[ \text{chi-2 'to suffer'} \]
\[ \text{SUFFER} <\text{HUMAN}:X \ \text{HARDSHIP}:Y> \]
\[ \text{R}(X) \text{ chi } \text{R}(Y) \]

\[ \text{chi-3 'to wipe out'} \]
\[ \text{WIPE-OUT} <\text{HUMAN}:X \ \text{OPPONENT}:Y> \]
\[ \text{R}(X) \text{ chi } \text{R}(Y) \]

6.4 Prototypes and Participants

So far, the identification of participants and circumstances, and the non-prototypical uses of processes have been discussed. However, there are still some problems with the specification of participants in the conceptual frames. In 5.3, it is argued that participants of a process can only be specified according to the categories to which the concepts
belong since the numbers of the categories are too numerous to list. The categories specified can be lower or higher on the taxonomic hierarchy. The remaining problem with this approach is that, for most of the processes examined in this study, the specifications are just approximations. In other words, some instances of a category specified may not occur with a given process, while some instances of a category not specified in a frame may occur with a process. For example, the categories of the second participant in the conceptual frame for the process ENTERTAIN is HUMAN. However, dírén 'enemy' which is an instance of HUMAN generally does not occur as the second participant of ENTERTAIN:

(28) Tāmen zhāodài dírén
they entertain enemy
'They entertain the enemy.'

Furthermore, the second participant of the process WORSHIP is specified as having the category HUMAN. But, jīngqián 'money', which is an instance of PROPERTY and does not belong to the category given in the conceptual frame of WORSHIP, can nevertheless occur as the second participant of WORSHIP:

(29) Tāmen chóngbài jīngqián
they worship money
'They worship money.'

Obviously, this is a metaphorical expression. But for a cognitive study of processes and participants, we should take this kind of phenomenon into account.
To account for examples (28) and (29), we again turn to the notion of prototypicality. That is, in the conceptual frames of most processes we treat the categories of participants as the prototypical categories. Accordingly, exceptions and metaphors are allowed in our system. In this way, metaphors are looked at as the expansion of the categories of participants in a conceptual frame. Thus, the categories are moved higher on the taxonomic hierarchy. In fact, there is no boundary between where one can start and where one should stop. It is a matter of degree rather than clear-cut lines.

In addition, viewing the categories of participants as prototypes allows us to account for the cases where non-prototypical instances of a category result in semantic anomalies. For example, the participant specified for the process FLY in Chinese has categories such as BIRD, INSECT, AEROPLANE, etc. However, qǐ'ér 'penguin' which an instance of BIRD, is conceptually implausible as agent of FLY:

(30)  a. Niǎo fēi le
      bird fly LE
      'The bird flew away.'

       b. ??Qǐ'ér fēi le
          penguin fly LE
          'The penguin flew away.'

In this case, the concept of prototypicality plays a role again. Therefore, it can be said that the categories of participants provided in most of the conceptual frames denote the prototypical instances of the category, not necessarily
the non-prototypical instances. So the non-prototypical instances may or may not fit into some conceptual frames since they are assimilated into the category on the basis of their being similar to the prototype in some aspects. In the case of gǐ'ér, it is treated like a bird because it has feathers, wings, a beak, etc. But it lacks the feature of 'able to fly'. This explains the anomaly of (30b).

Accordingly, our dictionary will mark the categories of participants in most of the conceptual frames as those of the prototypical participants. The categories of participants in the conceptual frames of most processes will be interpreted as those of the prototypical instances unless indicated otherwise. In this way, the knowledge of Chinese speakers can be shown to have prototype effects when dealing with categorization. As a result, example (14) in 1.1, which is repeated below, can be fully accounted for:

(31)  

a. Tā xiào wǒ  
he laugh I  
'He laughs at me.'

b. Tā xiào nà zhī gǒu  
he laugh that CL dog  
'He laughs at that dog.'

c. *Tā xiào nà běn shū  
he laugh that CL book  
'He laughs at that book.'

The conceptual frame for the process LAUGH-AT in Chinese is as follows:

(32)  

xiào-2 'to laugh at'  
LAUGH-AT <HUMAN:X HUMAN:Y>  
R(X) xiào R(Y)
(32) shows that the second participant of LAUGH-AT is prototypically a human being. But, gǒu, which is an instance of ANIMAL, can be assimilated to some extent because there are similarities between human beings and animals. On the other hand, shu, which is an instance of WRITTEN-DISCUOURSE, shows little similarity to human beings. Therefore, (32b) is totally rejected by Chinese speakers.

6.5 Default Participants

By default participants, we mean that the categories of participants for processes are not limited. However, if the second participant is not present, the speakers knows what is the default one. For example, the second participant of EAT is prototypically FOOD, MEDICINE, PLANT, ANIMAL, etc. If ever the speaker for some reason doe not mention the second participant, the listener is able to supply the omitted participant according to his knowledge of the conceptual frames. In this case, the missing participant is fàn 'meal'. If the listener hears the following sentence:

(33) Tā hái méi chī ne
he still not eat MP
'He has eaten yet.'

he will infer that the thing that is eaten is fàn, not any instance of medicine, plant or animal. Therefore, this type of default participant is different from contextually understood participant, whose existence can be illustrated by the following exchange:
(34)  a. Tā chī yào le ma
   he eat medicine LE MA
   'Has he taken the medicine?'

   b. Tā chī le
   he eat LE
   'He has.'

The first speaker has already mentioned the second participant
earlier in the context. So the second speaker thinks that it
is not necessary to repeat it since it is present in currently
active conceptual connections.

This kind of default participant is included in the
conceptual frames and marked with the symbol '{()}. Thus, the
prototypical conceptual frame for EAT has the following form:

(35)  chī-1 'to eat'
EAT <ANIMATE:X
(FOOD,PLANT,MEDICINE,ANIMAL,(MEAL/fàn)):Y>
R(X) chī R(Y)

6.6 Cognate Deletable Participants

Cognate deletable participants can be either present or
absent with their process. If ever there is the second
participant, it must be the one specified. For example, the
process FALL takes either FALL/jiāo or nothing as its second
participant. If the second participant ever occurs, it must
be jiāo. Other similar processes are WALK, GASP, and so on.
The cognate deletable participants for WALK and GASP are
WAY/lù and AIR/qì, respectively. Cognate deletable
participants are indicated by the symbol '[]'. Thus, the
conceptual frames for FALL-DOWN, GASP and WALK are like the
following:
(36)  shuāi-1 'to fall down'
      FALL-DOWN <HUMAN:X [jiāo]>
      R(X) shuāi [jiāo]

      chuǎn 'to gasp'
      GASP <ANIMATE:X [qì]>
      R(X) chuǎn [qì]

      zǒu-1 'to walk'
      WALK <ANIMATE [lù]>
      R(X) zǒu [lù]

6.7 Cognate Participants

Cognate participants are those the categories of which are very much restricted. Generally speaking, they are basic-level categories. Thus, they have many fewer subcategories than those non-basic-level categories. For instance, the category TABLE has many fewer subcategories than its supercategory FURNITURE which is a non-basic-level category. Consequently, we say that categories of participant of this nature are restricted. As an example, consider the conceptual frame for the process BREW/MAKE:

(37)  niàng 'to brew/make'
      BREW/MAKE <(HUMAN,BEE):X (WINE,HONEY):Y>
      R(X) niàng R(Y)

Note that, according to Rosch's (1976) theory, BEE, WINE and HONEY are basic-level categories since they are the highest level at which category members have similarly perceived overall shapes. The categories of cognate participants are signaled. Thus, the conceptual frames for some processes which require cognate participants are shown as below:

(38)  dào-2 'to back'
      BACK <HUMAN:X 'CAR':Y>
      R(X) dào R(Y)
shēng 'to grow'
GROW <HUMAN:X 'ANGRY':Y>
R(X) shēngqi R(Y)

dèng 'to glare'
GLARE <ANIMATE:X 'EYE':Y>
R(X) dèng R(Y)

6.8 Idiomatic Expressions

The second participants in idiomatic expressions are so fixed that they cannot be left out except contextually. Moreover, the second participant does not constitute a category, that is, it is just an instance of some category. Moreover, the meaning of idiomatic expressions can be analyzed from their component morphemes. For instance, the process BECOME-JEALOUS is realized by the lexical form chīcù the first part of which means 'to eat' and the second part means 'vinegar'. In discourse, the second part can be omitted only when the user answers a question:

(37) a. Tā chīcù le ma
    he get-jealous LE MA
    'Did he become jealous?'

    b. Chī le
    get LE
    'He did.'

Moreover, the second participant of some idiomatic expressions normally may not even be separable from the process by aspectual particles, except personal pronouns:

(38) a. *Tā chī zhe cù
    he get ZHE jealous
    'He is getting angry.'

    b. Tā shēng wǒ de qì
    he get my DE angry
    'He is angry with me.'
Therefore, idiomatic expressions are treated as single units, i.e. they only take one participant, rather than processes that presuppose two participants. Thus, the conceptual frames for some idiomatic expressions are as follows:

(39)  

chīcū 'to become jealous' (literally means 'eat vinegar')
BECOME-JEALOUS <HUMAN:X>
R:X chīcū

chuīniū 'to boast' (literally means 'blow cows')
BOAST <HUMAN:X>
R:X chuīniū
Notes to Chapter 6

1. This is probably because their focus is on the transitivity of clauses, i.e. the action carried from the subject to the object.


3. In our system, it is process-participant relationship since we regard event as realizations of processes.

4. That is, they are not marked by prepositions.

5. Some Chinese prepositions like zài and yòng can also be used as verbs. Accordingly, they are referred to as 'coverbs' in Li and Thompson (1981).

6. In Chinese passive constructions, the agent can also be marked by ràng and jiào.

7. huā is also a coverb.

Chapter 7

THE CONCEPTUAL RELATIONSHIPS BETWEEN PROCESSES AND PARTICIPANTS

In the previous chapters, the categories of processes and participants have been established. Their structure and organization have also been explored. In addition, the types of participants and their relevancy to conceptual frames were examined at length. It was argued that prepositions also play a role in relating peripheral participants to processes. In this chapter, the relationships between processes and their central participants, and the relationships among the central participants are investigated.

7.1 Knowledge of the Relationships

In addition to categories and hierarchies of processes and participants, Chinese speakers also know how a participant is related to a process. In other words, they know what type of role it plays. Of course, this knowledge is based on the categories of processes and participants. For example, the process HIT, which is realized by the lexical verb 打, belongs to the category of Affective Action. Accordingly, Chinese speakers know that its conceptual frame contains two central participants. Prototypically, the first and the second both have the semantic category of HUMAN. Moreover, Chinese users have in their conceptual structure the information about the conceptual relationships between the process HIT and its participants, i.e. HIT takes a performer of the action and an undergoer of the action. Finally,
besides the conceptual frame the lexical entry of process also includes information about the unmarked order of the realization of the process and its participants, viz, the realization of the performer precedes that of the process, while that of the undergoer follows that of the process.

Generally speaking, participant roles are indefinite in number because the roles of individual participants are defined by each individual process. As Lamb (1991a) points out, the more one investigates the relationships, the more one finds that further distinctions are needed. This is what Halliday (1985) has tried to do, but has stopped short of going beyond a fairly limited number of roles for some reason, probably because if the analysis is carried to the extreme, there will be at least as many participant roles as there are processes, or even more since some processes presuppose more than one participant. For example, the conceptual process EAT takes an Eater as its first participant and an Eateree as its second participant. In the case of BUY, on the other hand, there are a Buyer and a Buyee (the object bought).

However, as Lamb (1991a) suggests, there is always a need to classify roles into a small number of categories, as has been done by many linguists (Refer to Chapter 2 for details). The reason is probably that the speakers of a language tend to group participants with similar roles together. Although the diversity of relationships between processes and participants are practically indefinite, some basic similarities can be
found (cf. Davis 1991). Furthermore, languages have various kinds of device to distinguish them on the basis of the similarities. For example, Indo-European and Uralic languages use case endings to indicate the high-level categories of participants (Lamb 1991:110). In the case of Chinese, the categories of processes and, as shown in 6.1, the positions of the realizations, and the prepositions used can signal the roles of participants although there are no case endings (See 7.4 for the correlations between the categories of processes and the semantic roles of their participants).

In addition, the categories of the participant roles also have a hierarchical structure. On the top, there are at most three categories. That is, P1 designates the first or the only participant (e.g. some processes like máng 'busy' require only one unmarked) for all processes; P2 is the second participant for some processes; P3 is the third central participant for a small number of processes. At the bottom of the hierarchy, there are innumerable many participant roles defined by the individual processes. Since these relationships at the bottom are evident in the environment of their respective processes, e.g. the process KICK has a Kicker and a Kickee (cf. Lamb 1991:110), we do not need to specify roles of the lowest level of the hierarchy. Thus, what is needed is to sort out the categories and correlations at the intermediate levels.
The conceptual roles of participants at the intermediate level correlate with the categories of processes. That is, the prototypical roles of the participants vary from group to group. For example, the prototypical role of P1 for State processes, in particular Relational processes, is Token, while P2 is Value, as shown by the following sentences:

(1)  
  a. Tā xìng Wáng  
      he be-surnamed Wang  
      'He is surnamed Wang.'

  b. Tā shì jiàoshòu  
      he is professor  
      'He is a professor.'

In the conceptual structure of Chinese speakers, both of the processes in (1) presuppose two participants: P1, the thing to which some value is attributed and P2, the attributed value (cf. Halliday 1985).

On the other hand, an Action process prototypically takes an Agent and a Patient as its two participants. That is, their roles are conceptually different from those in (1), as shown below:

(2)  
  a. Tā tī nà zhī gǒu  
      he kick that CL dog  
      'He kicks that dog.'

  b. Tā qiē le cài  
      he cut LE vegetable  
      'He cut the vegetable.'

Clearly, Agent is the participant that performs the action, whereas Patient denotes the participant that is being acted upon.
In a similar way, conceptual roles can be assigned to the participants of other groups of processes like Status and Event. Thus, the correlations between the categories of processes and the prototypical participant roles can be described as in Figure 1:

<table>
<thead>
<tr>
<th></th>
<th>Proto.</th>
<th>P1</th>
<th>P2</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE</td>
<td>2</td>
<td>TOKEN</td>
<td>VALUE</td>
</tr>
<tr>
<td>STATUS</td>
<td>1</td>
<td>EXPERIENCER</td>
<td></td>
</tr>
<tr>
<td>ACTION</td>
<td>2</td>
<td>AGENT</td>
<td>PATIENT</td>
</tr>
<tr>
<td>EVENT</td>
<td>1</td>
<td>ERGATUM</td>
<td></td>
</tr>
</tbody>
</table>

Figure 1
Correlations between the Categories of Processes and the Conceptual Roles

7.2 Roles and Relationships of processes to Participants

In most cases, the conceptual roles of participants depend on their relationships to processes. In this section, a closer examination of the correspondences will be carried out on the intermediate categories of the conceptual roles of participants presupposed by different groups of processes.

7.2.1 Status Processes

Status processes include several subgroups: Experience, Condition, etc. Semantically, Experience processes can be further divided into two major subcategories, physical and mental, the second of which can be further subgrouped as Emotional, Cognitive and Perceptual. Most Status processes
prototypically require only one unmarked participant except some Emotional processes and all the Cognitive and Perceptual processes, which take two positionally marked participants, as shown below:

(3)  
a. Tā lèi le  
   he tired LE  
   'He is tired.'

   b. Tā hěn gāoxìng  
      he very happy  
      'He is very happy.'

   c. Tā zhīdào zhè jiàn shì  
      he know this CL matter  
      'He knows the matter.'

   d. Tā kànjiàn le nèi liàng chē  
      he see LE that CL car  
      'He saw that car.'

Clearly, on the higher level of the taxonomy of roles, the conceptual relationships between the first participant and the process in (3) can be characterized as experiencing the condition or status. So Experiencer is a proper term for the conceptual role of the first participant at that level. On the lower level, roles such as Senser, Cognizer, Perceiver, etc. can be identified. But, they are all subcategories of Experiencer.

The second participant of some Status processes like Cognitive and Emotional, etc. is neither something attributed to the first nor something affected by the process. Moreover, it semantic category prototypically lies at the top of the taxonomic hierarchy of things, i.e. anything can occur as the second participant. Consider:
(4)  
   a. Tā xǐhuān zōngjiào  
       he like religion  
       'He likes religion.'
   
   b. Tā xǐhuān wǒ  
       he like I  
       'He likes me.'
   
   c. Tā xǐhuān zhè běn shū  
       he like this CL book  
       'He likes this book.'

The second participant in (4) can be an abstract idea, a human being or a concrete object. They are not in any sense physically affected by the process xǐhuān. They are not attributes to the first participant, either. So they cannot be captured by the term Value or Patient. Accordingly, Halliday's (1985) term Phenomenon is used here to signal their semantic role.

In the case of Condition processes, they prototypically require only one participant, which is conceptually like the Token in State processes because they are not animate, and thus cannot be the experiencer of the process. To maintain the distinction, the term Conditioned is used to indicate the semantic role of the unmarked participant of Condition processes. As examples, consider:

(5)  
   a. Shuǐ tài ràng le  
       water too hot LE  
       'The water is too hot.'
   
   b. Tā de shǒujiǎo bīngliáng  
       he DE hand foot ice cold  
       'His hands and feet are as cold as ice.'

The difference between State processes and Status processes lies in the fact that the former are generally permanent,
while the latter are temporary since the status they express can change in a short time.

7.2.2 Action Processes

As shown in 4.1, Action processes can be divided into two major classes: Behavior and Act. Each of them can be further divided into smaller groups on the basis of conceptual properties and types of participants. Thus, a partial classification of Action processes is shown in Figure 2.

| NATURE | PHYSICAL |
| BHAEAOR | VERBAL |
| HUMAN | PERCEPTUAL |
| | COGNITIVE |
| | EMOTIONAL |

| DYNAMIC |
| DIRECTIONAL |
| AFFECTIVE |
| STATIC |
| TRANSACTIONAL |
| TRANSFERRAL |
| CREATIVE |
| RANGE |
| GOAL |

Figure 2
A Partial Classification of Action Processes

Action Processes prototypically presuppose two participants: the performer of the action with control and volition, i.e. Agent, and the receiver of the action that is physically affected by the action, i.e. Patient. The prototypical situation described by Action processes is that some human being acts directly upon some concrete thing,
whether a human or object. As Langacker (1987b) puts it, the energy flows from the agent to the patient. In this connection, the Affective Act processes are the most prototypical Action processes since they all take an Agent and a Patient as their participants. As examples, consider the following:

(6) a. Tā zài tàng yīfu
    he ZAI iron clothes
    'He is ironing the clothes.'

   b. Tā qǐ zhe mǎ
    he ride ZHE horse
    'He is riding on the horse.'

Evidently, the first participant of both clauses is the performer of the action and the second participant of both sentences is directly affected by the action. Thus, they can be said to play the Agent and the Patient roles.

Goal processes differs from Affective processes in that the second participant which they take is not physically affected in the sense that it is either an abstract idea or the scope or range of the action, as shown below:

(7) a. Tāmen cāiqū le hěnduō cuòshī
    they adopt LE many measure
    'They have adopted many measures.'

   b. Zhāngsān měitiān shuō Yīngyǔ
    Z.S. every day speak English
    'Z.S. speaks English every day.'

The second participant in (7b) is the Range in Halliday (1985) and Teng (1975). However, the term Range is used only to refer to cognate participants in our system. So the term Goal is employed instead.
The rest of Act processes are less prototypical, viz. they either take just one participant or, take a non-Patient second participant, or presuppose more than two positionally marked participants, the second of which, however, is not a patient. Dynamic processes take only one unmarked participant, as in (8):

(8)  
   a. Tā zài tiào  
        he ZAI jump  
        'He is jumping.'

   b. Tā zài dì shàng pá  
        he at ground above crawl  
        'He is crawling on the ground.'

Although the first participant is the performer of the action, he does not act upon something else. So the patient is absent.

Directional and Static processes often take a second unmarked participant. However, this participant is not a patient, that is, it is not directly affected by the processes. Conceptually, the second participant is the destination, the source or the location of the process:

(9)  
   a. Tā qù xuéxiào le  
        he go school LE  
        'He went to school.'

   b. Tā líkāi Shànghǎi le  
        he leave Shanghai LE  
        'He left Shanghai.'

   c. Tā zuò yīzǐ  
        he sit chair  
        'He sits in a chair.'
The conceptual roles of Source and Destination can be established for (9a) and (9b). They are all considered the subcategories of Location.

Like Affective processes, Creative processes always require two participants. Although their second participant are directly affected by the processes, the things denoted by these participants do not come into being until the action is finished. Accordingly, they are the outcome of the processes. Observe:

(10)  a. Tā huà le yī ge quānr
      he draw LE one CL circle
      'He drew a circle."

          b. Tā zuò le hěnduō cài
             he cook LE many dish
             'He cooked many dishes."

The term Effect⁶ can be used to distinguish them from Patient. Conceptually, it is also a subgroup of Patient.

Unlike Creative processes, the second participant of transaction processes is physically affected by the processes in the sense that it has undergone a change of ownership, i.e. it has moved from one place to another. For example, the transaction process PAWN means that a person takes whatever belongs to him to a pawn shop for some money, as shown below:

(11)  Tā dàng le tā de yīfu
      he pawn LE he DE clothes
      'He pawned his clothes."

The things which he takes to the shop are signaled by the second participant. Moreover, there is also money that has
changed hands in the transaction the other way round. So this type of participant is termed Exchange.

Transfer processes are little different from transaction processes in that they involve only a one-way transaction, i.e. the first participant hands over something to the second participant not for something in return. In addition, transfer processes often take a positionally marked recipient or source. Consider:

(12)  a. Tā jiè wǒ yì běn shū
       he borrow I  one CL book
       'He borrowed a book from me.
       He lent me a book.'

       b. Tā sòng wǒ yī ge jièzhǐ
       he give I one CL ring
       'He gave me a ring.'

       c. Wǒ zū tā yī jiān fāng
       I rent he one CL room
       'I rent a room from him.
       I rent a room to him.'

Sometimes, the thing that is delivered is not a concrete object, but an abstract idea. For instance, the process jiāo 'to teach' only takes abstract participants, as illustrated in (13):

(13)  a. Tā jiāo wǒ xuéxi de fāngfǎ
       he teach i study DE method
       'He taught me methods of study.

       b. Zhāngsān gào su tā zhè ge xiāoxi
       Z.S. tell he this CL news
       'Z.S. told him the news.'

Obviously, both of the sentences involve imparting of information. Yet, the transfer of knowledge is still one-way, only to the recipient. Note that the transfer is
metaphorical, based on physical transfer, and thus present conceptually but not in the real world, as the information is still present in the sender who offers the metaphorical "transfer". In all of these cases, the second participant is named the Transferred.

The last type of Act processes are the Range processes, which are, according to Halliday (1985), the processes which have as second participant the range or scope of the process. Teng (1975) defines Range as a noun that does not undergo a certain kind of change of state. Neither of their definitions are not very explicit because the terms 'range' and 'change of state' are not clear themselves. They also claim that the basis of range is Cognate objects (See Halliday 1985 and Teng 1975 for details). However, they also include things that do not function as cognate objects. For example, Halliday (1985:134) says that cognate is not the necessary feature for range; most range elements in English are not cognate to the verb even if they are close in meaning, e.g. game and play. Teng (1975:96) suggests that effective patient be included since 'creation' is a type of change of state. Thus, the creative processes in our system fall into his Range. In this study, the term Range is restricted only to concepts cognate to the process. The reason is that if Mary climbed the mountain has mountain as the range (Halliday 1985:134), there in no reason why horse is not a range in he is riding a horse. Following his example, most affective processes come under the
range processes. Then, the distinction between patient (in Halliday's term, Goal) and range cannot be maintained for this type of situation. Our classification of Range processes fits neatly in the type of cognate participant discussed in the last chapter. In other words, cognate processes have a fixed second participant, as shown in the following examples:

(14)  

a. Tā chàng le yī shǒu gē  
he sing LE one CL song  
'He sang a song.'

b. Wǒ shuì le yī jiào  
I sleep LE one sleep  
'I had a sleep.'

c. Tā tiào le yī yè wǔ  
he jump LE one night dance  
'He danced the whole night.'

In any case, no other category of participant can be used to substitute for the one used. Moreover, we find that Teng's (1975:97) claim that Range can be definite, but cannot occur in the bā-construction, is a bit faulty. For example, all the sentences in (14) can be turned into bā-constructions if the verb has some additional element, e.g. resultative ending like wán. Compare:

(15)  

a. Ta bā gē chàng-wán le  
he BA song sing-finish LE  
'He finished singing.'

b. Tā bā jiào shuǐ-wán le  
he BA sleep sleep-finish LE  
'He finished sleeping.'

c. Tā bā wǔ tiào-wán le  
he BE dance jump-finish LE  
'He finished dancing.'
This test can be used to check if a process is an idiomatic expression since an idiomatic expression cannot occur in a bā-construction. This is due to the fact that the position of the second participant of an idiomatic process is fixed. Therefore, moving it around is not allowed:

(16)  
a. *Tā bā cù chī-(wán) le  
    he BA vinegar eat-(finish) LE  
    '*He finished being jealous.'  
    'He has eaten up the vinegar.'

b. *Tā bā niū chuī-(wán) le  
    he BA cow blow-(finish) LE  
    '*He has finished boasting.'  
    '?He has stopped blowing the cow.'

Behavioral processes, including natural and human ones, are less prototypical Action processes. For one thing, natural behavior processes normally take one participant. It is not an Agent because it has no control and volition. It is thus referred to as Actor in this study. Moreover, the actor does not occur in front of the process, but follows it:

(17)  
a. Guā fēng le  
    blow wind LE  
    'Wind is blowing.'

b. Dǎ léi le  
    strike thunder LE  
    'It is thundering.'

Still, Actor can be treated as a subcategory of Agent.

Human behavioral processes are non-prototypical Action processes since they take only one central participant or their second participant is not a Patient, that is, it is not physically affected by the process. For example, physical and
emotional behavioral processes presuppose only one participant which functions as the Agent of the process:

(18) a. Tā kěsòu le
    he cough LE
    'He is coughing.'

   b. Zhāngsān fāhuǒ le
      Z.S. lose temper LE
      'Z.S. lost his temper.'

Although perceptual, cognitive and Action processes require two positionally marked participants, the second one denotes something that is not directly affected by the processes:

(19) a. Tā tīng yīnyuè
    he listen music
    'He listens to music.'

   b. Tā zài kǎolù wèntí
      he ZAI consider question
      'He is thinking about the problem.'

In this case, we again use Goal, as distinguished from Patient.

7.2.3 Event Processes

Event processes prototypically presuppose only one participant which is prototypically inanimate. That is, it is not an Agent in our definition. As examples, consider:

(20) a. Chē tīng le
    car stop LE
    'The car stopped.'

   b. Qiáo tā le
      bridge collapse LE
      'The bridge collapsed.'

It is clear that the participant of both sentences in (20) is not an animate performer of an action, but a passive undergoer of some event. It has no control or volition even if the
participant is animate. For instance, the process sǐ 'die' typically takes one participant which has no control over the situation since death normally is not desired or controlled by human beings or animals. This type of participants is referred to as Ergatum⁷ in our system.

There are two types of event processes which presuppose two participants. The first type is derived from the one-participant type, that is, the same process can be used syntactically as a transitive verb. In this case, the first participant is a human and the second is an inanimate. For example, in the following sentences,

(21) a. Tàiyáng shēng qǐ lái le
sun rise up LE
'The sun rose up.'

b. Tāmen bā qízi shēng qǐ lái le
they BA flag raise up LE
'They raised the flag.'

the undergoer of the event is the only participant in (21a), while the undergoer of the event is the second participant in (21b). Therefore, the Ergatum in (21b) is qízi, not tāmen. Semantically, tāmen is the instigator of the event, i.e. the causer, whereas qízi is the causee. Therefore, sentences like (21b) constitute causative constructions in Chinese. Thus, the first participant of causative processes is called the Causer.

The second type of two-participant event processes are the Acquisition and Deprivation type of which the first participant is usually an ergatum since it does not have
control and volition. Moreover, the second participant of this kind of process is not acted upon, hence not physically affected. Observe:

(22)  a.  tā dé le yī liàng xī chē
     he get LE one CL new car
     'He got a new car.'

     b.  tā diū le yī liàng xīn chē
     he lose LE one CL new car
     'He lost a new car.'

Obviously, the first participant is not a performer of an action, but an ergatum. The second participant yī liàng xīn chē is not a patient that undergoes an action, but the Goal in our system.

Furthermore, there are some event processes that presuppose three participants, the third of which itself is a process. Syntactically, the realization of such processes constitutes a periphrastic causative construction in Chinese. For example, the process shǐ 'to cause' prototypically takes an instigator, i.e. causer, an experiencer and a process which is either a state or a status, as in (23):

(23)  a.  zhè ge hǎo xiāoxi shǐ tā hěn gāoxìng
       this CL good news cause he very happy
       'This good news made him very happy.'

     b.  tā shǐ zhāngsān fēicháng dānxīn
     he cause Z.S. very worried
     'He made Z.S. very worried.'

On the other hand, the third participant of ràng, jiào, etc. can also be an Action process. Thus, the second participant is the agent of the action, as shown below:
(24) a. Lǎoshī ràng tā bèisòng le kèwén
teacher let he recite LE text
'The teacher made him recite the text.'

b. Wǒ jiào tā fāhuǒ le
I call he lose temper LE
'I made him lose his temper.'

Note that the third participant bèisòng in (24a) itself takes a participant kèwén. However, kèwén cannot be treated as a participant of ràng. Thus, it can be said that this kind of event processes still takes three unmarked participants: causer, causee and a process.

7.3 The Relationships between Participants

In some cases, the conceptual roles of participants are more explicit if looked at in terms of the relationships between participants rather than process-participant relationships, as is the case in State processes. In addition, the conceptual roles of some Event processes also depend on the relationships between the participants involved.

7.3.1 State Processes

State processes are divided into four subcategories: relational, quality, existential and possessive, each of which requires one or two unmarked participants. Prototypical State processes like shì 'to be' and xìng 'be-surnamed', as shown in (2), take a Token as its first participant and a Value as its second participant. Quality processes are less prototypical because they take only one unmarked participant, as shown below:

(25) a. Tā hěn cōngmíng
he very smart
'He is very smart.'

b. Tā fēicháng lǎn
   he awfully lazy
   'He is awfully lazy.'

This is because the processes in (25) function both as the process and the Value although their first participant plays the role of Token.

Existential processes are even less prototypical since they take only one unmarked participant which conceptually is not the Token, but Existent. Although some of them also take a Location, it is omissible. Moreover, the two major Existential processes yǒu and zài are complementary with each other: the Existent of the former occurs preverbally since it is given information, where the Existent of the latter occurs post-verbally since it is new information. Compare:

(26) a. Shū zài zhūōzi shàng
    book at/in table above
    'The book is on the table.'

    b. Zhūōzi shàng yǒu yī běn shū
    table above have one CL book
    'There is a book on the table.'

Notice that the locations in both sentences are marked with a localizer, and are hence marked participants. However, zài sometimes takes a unmarked location, as shown below:

(27) Tā zài xuéxiào
    he be-at school
    'He is at school.'

In addition, the locations in a Existential clause can be left out when they are understood from the context. Observe:
From the gloss, it can be seen that when the location of *zài* is omitted, its interpretation depends on where the speaker is. And when the location of *yǒu* is not present and is not given in the discourse, it must be interpreted as 'here'.

The Possessive processes are more prototypical than Existential processes due to the fact that they presuppose two unmarked participants: a Possessor and a Possessed.\(^{10}\) According to Halliday (1985), the two unmarked participants can be treated as Token vs. Value on a higher level. Like Existential processes, Possessive processes also have a complementary pair, *yǒu* and *shūyū*, i.e. the first participant of *yǒu* is the Possessor and the second is the Possessed. Moreover, the Possessed of *yǒu* is generally indefinite, while the Possessed of *shūyū* is definite, as illustrated in (29):

(29)  

| a. Tā yǒu yī běn shū  
| he have one  CL book |
| 'He has a book.' |

| b. Nà běn shū shūyū tā  
| that CL book belong he |
| 'That book belongs to him.' |

To capture this complementarity, the order of the Possessor and the Possessed is spelt out in the conceptual frames. Compare:
(30)  yǒu-2 'to have/possess'  
HAVE/POSSESS <Possessor:THING:X Possessed:THING:Y>  
R:X you R:Y

shòuyǔ 'to belong to'  
BELONG-TO <Possessed:THING:X Possessor:THING:Y>  
R:X shuyu R:Y

7.3.2 Other Cases

Some event processes like DIE and GET-WOUNDED normally take one participant. In other words, the undergoer of the event serves as the first participant, as shown below:

(31)  a. Xiǎo Wáng sǐ le  
X. W. die LE  
'X. W. died.'

b. Tā de tuǐ shāng le  
he DE leg wound LE  
'His leg was wounded.'

But when they take two participants, their first participant is not in any sense part of the process. On the contrary, it is defined by its relation to the second participant which is the ergatum of the process. As examples, consider the following:

(32)  a. Xiǎo Wáng sǐ le fūqīn  
X. W. die LE father  
'X. W. had his father die on him.'

b. Tā shāng le tuǐ  
he wound LE leg  
'He had his leg wounded.'

Note that the first participant in both sentences is conceptually related to the second participant and only indirectly to the process, in a relationship similar to that of a beneficiary. Moreover, the second participant typically must be, in traditional terms, an inalienable part of the
first participant. In the case of DIE, the second participant should be a family member of the first participant. Thus, it is in a sense inalienable to the first participant. For lack of a better term, Possessor is used to indicate the first participant in both of (32). This is of course metaphorical 'possession', an expansion of material ownership. There are many processes of this type in Chinese. They all denote the fact that the first participant experiences some unfortunate consequence, i.e. adversity. Thus, the first participant of both sentences in (32) is conceptually the maleficiary and the possessor, as shown in the conceptual frames in (33):

\[
\begin{align*}
\text{(33)} & \quad \text{shāng 'to get wounded'} \\
& \quad \text{GET-WOUNDED} \ <\text{Ergatum:BODY-PART:X}> \\
& \quad R(X) \ \text{shāng}
\end{align*}
\]

\[
\begin{align*}
& \quad \text{shāng 'to get wounded on'} \\
& \quad \text{GET-WOUNDED-ON} \ <\text{(Possessor+Maleficiary):HUMAN:X}>
\end{align*}
\]

\[
\begin{align*}
& \quad \text{Ergatum:BODY-PART:Y}> \\
& \quad R(X) \ \text{shāng} \ R(Y)
\end{align*}
\]

\[
\begin{align*}
\text{sǐ 'to die'} \\
& \quad \text{DIE} \ <\text{Ergatum:LIVING:X}> \\
& \quad R(X) \ \text{sǐ}
\end{align*}
\]

\[
\begin{align*}
& \quad \text{sǐ 'to die on'} \\
& \quad \text{DIE-ON} \ <\text{(Possessor+Maleficiary:HUMAN:X}} \\
& \quad \text{Ergatum:HUMAN:Y}> \\
& \quad R(X) \ \text{sǐ} \ R(Y)
\end{align*}
\]

Furthermore, some other event processes like qǔ 'to marry' and jià 'to marry' presuppose two participants. In addition to the relationships between the process and its participants, e.g. the first participant is the Ergatum and the second is the Goal since it is not directly acted upon, and yet involves change of state, the relationships between
the two participants are also explicit to Chinese speakers. That is, they know that when ǒu is used, the first participant is male and the second is female. On the other hand, when jià is employed, the relationship is vice versa, that is, the first participant denotes a female, while the second signals a male. Compare:

(34)  
   a. Tā ǒu le yī ge riběn rén  
       he marry LE one CL Japan person  
       'He married a Japanese.'
   b. Tā jià le yī ge riběn rén  
       he marry LE one CL Japan person  
       'She married a Japanese.'

In our dictionary, this kind of knowledge is also included:

(35)  
   qū 'to marry'  
   R(X) qū R(Y)
   jià 'to marry'  
   R(X) jià R(Y)

7.4 The Hierarchy of the Conceptual Relationships

So far, it has been shown that in most cases different conceptual roles can be assigned to the participants of processes with different conceptual categories which are defined in part according to their PERIODICITY. In other words, difference in their periodicity results to some extent in the difference in their relationships to participants, which in turn determines the conceptual roles of participants. Moreover, most of the participant roles can be further divided on conceptual grounds. Thus, a conceptual role can have more than one subrole. In this connection, it can be said that the
relationships exemplified by the conceptual roles also have a hierarchical structure.

As argued in 7.1, on the top of the hierarchy, the first positionally marked participant is named P1. If there are two positionally marked participants, we have P1 and P2. In addition, P3 can be added if some processes presuppose three positionally marked participants. However, if one of the four major categories of processes is examined, it is found that a supercategory can be established for the different semantic roles therein. For example, the first participant of State processes can be Token, Existent, Possessor, etc. Yet, they can be designated with the label Identified since they are all something to which something else is attributed. Therefore, the second participant of this group which contains Value, Possessed, etc. can be characterized with the label Identifier.¹² Accordingly, the general conceptual properties of the participants and the different levels of conceptual roles can be indicated at the beginning of each major category of processes. For instance, State processes have the following outline specification:

(36) State: P1=Identified    P2=Identifier
    Token                   Value
    Existent(Existent)      Possessed
    Possessor

By the same token, the participants of Status processes can be said to include a Undergoer and a Phenomenon at the top level. However, Phenomenon does not have any subcategory.
Thus, the general frame and participant hierarchy is as shown below:

(37) Status: P1=Undergoer  P2=Phenomenon

\[\text{Senser} \quad \text{Cognizer} \quad \text{Perceiver}\]
\[\text{Undergoer} \quad \text{Experiencer} \quad \text{Conditioned}\]

Unlike the above two groups, Action processes have a more complex hierarchical structure since their second participant plays several different types of roles defined by its relationships to the processes. On the top of the hierarchy, the first participant is the performer of the action, while the second participant can be characterized as the bearer of the action. In addition, the third participant can only be either the recipient or source. Accordingly, it can be referred to as the Orientation of the action. As a result, the hierarchy of Action will be as follows:

(38) Action: P1=Performer  P2=Bearer  P3=Orientation

\[\text{Actor} \quad \text{Agent}\]
\[\text{Effect} \quad \text{Patient} \quad \text{Transferred}\]
\[\text{Bearer} \quad \text{Exchange} \quad \text{Goal}\]
\[\text{Location} \quad \text{Source} \quad \text{Destination}\]
\[\text{Orientation} \quad \text{Source} \quad \text{Recipient}\]
Finally, the first participant of event processes, as shown in 7.2, can have several different roles. Most event processes take an Ergatum as its first participant and, if there is a second participant, a Goal. Some one-participant processes can be used as causatives. In this case, the first participant is the causer and the second is the causee. Some processes serve as periphrastic causatives. Accordingly, they take three participants: the causer, the causee and the caused. In this connection, a general term for the first and the second participants of event processes is not available except for P1 and P2. The third one can designated by the term 'caused'. However, P3 can be used since P1 and P2 are employed. Thus, the hierarchical structure of the conceptual roles for event processes is like the following:

(39) Event:

```
  |--- Ergatum
P1  |--- Causer
     |--- Causee
P2  |--- Goal
     |--- State
        |--- Status
        |--- Action
        |--- Event
```

The roles of participants presupposed by all categories of processes can be summarized in Figure 2:
<table>
<thead>
<tr>
<th>Processes</th>
<th>Participants</th>
<th>P1</th>
<th>P2</th>
<th>P3</th>
</tr>
</thead>
<tbody>
<tr>
<td>STATE:</td>
<td>IDENTIFIED</td>
<td>IDENTIFIER</td>
<td>VALUE</td>
<td></td>
</tr>
<tr>
<td>Relational</td>
<td>TOKEN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Existential</td>
<td>EXISTENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quality</td>
<td>TOKEN</td>
<td></td>
<td>PHENOMENON</td>
<td></td>
</tr>
<tr>
<td>Possessive</td>
<td>POSSESSOR</td>
<td></td>
<td>POSSESSED</td>
<td></td>
</tr>
<tr>
<td>STATUS:</td>
<td>UNDERGOER</td>
<td></td>
<td>PHENOMENON</td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>EXPERIENCER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental</td>
<td>EXPERIENCER</td>
<td></td>
<td>PHENOMENON</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>CONDITIONED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ACTION:</td>
<td>PERFORMER</td>
<td></td>
<td>Bearer</td>
<td></td>
</tr>
<tr>
<td>Nature</td>
<td>ACTOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical</td>
<td>BEHAVIOR</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental</td>
<td>SENSER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Verbal</td>
<td>AGENT</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Emotional</td>
<td>AGENT</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Dynamic</td>
<td>AGENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directional</td>
<td>AGENT</td>
<td></td>
<td>(LOCATION)</td>
<td></td>
</tr>
<tr>
<td>Static</td>
<td>AGENT</td>
<td></td>
<td>(LOCATION)</td>
<td></td>
</tr>
<tr>
<td>Creative</td>
<td>AGENT</td>
<td></td>
<td>EFFECT</td>
<td></td>
</tr>
<tr>
<td>Affective</td>
<td>AGENT</td>
<td></td>
<td>PATIENT</td>
<td></td>
</tr>
<tr>
<td>Transaction</td>
<td>AGENT</td>
<td></td>
<td>EXCHANGE</td>
<td></td>
</tr>
<tr>
<td>Transfer</td>
<td>AGENT</td>
<td></td>
<td>ORIENTATION</td>
<td></td>
</tr>
<tr>
<td>Range</td>
<td>AGENT</td>
<td></td>
<td>RANGE</td>
<td>TRANSFERR</td>
</tr>
<tr>
<td>Goal</td>
<td>AGENT</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>EVENT:</td>
<td>ERGATUM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Occurrence</td>
<td>ERGATUM</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Inception</td>
<td>ERGATUM</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Cessation</td>
<td>ERGATUM</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Deprivation</td>
<td>ERGATUM</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Acquisition</td>
<td>ERGATUM</td>
<td></td>
<td>GOAL</td>
<td></td>
</tr>
<tr>
<td>Causation1</td>
<td>CAUSER</td>
<td></td>
<td>CAUSEE</td>
<td>CAUSED</td>
</tr>
<tr>
<td>Causation2</td>
<td>CAUSER</td>
<td></td>
<td>CAUSEE</td>
<td></td>
</tr>
</tbody>
</table>

Figure 2
Summary of Conceptual Roles
Notes to Chapter 7

1. 'token' and 'value' are adopted from Halliday (1985), where token is defined as the identified and value the identifier.

2. We consider 'agent' the performer of the action, which has control and volition, and 'patient' is the receiver of the action, which is physically affected.

3. Halliday (1985) uses 'senser' to indicate the first participant of Mental processes like see and feel.

4. In Halliday (1985), 'phenomenon' is used to denote the second participant of Mental processes, which correspond to our Mental Experiential processes. It is used in the same way in this study.

5. Halliday (1985) uses 'goal' in a broader sense, i.e. 'one to which the process is extended'. In Teng (1975), it is considered the opposite of 'source'.

6. Teng (1975) treats this type of participant as Range.

7. This term has been used in Ikegami (1970).

8. The term 'existent' is from Halliday (1985).


10. 'possessor' and 'possessed' are adopted from Halliday (1985).

11. I owe this the term 'maleficiary' to Professor Sydney Lamb.

12. According to Halliday (1985), 'identifier' is the second participant in an identifying clause. Here it is used in a broader sense, i.e. it designates the conceptual role of the second participant of all state processes which presuppose two participants.
Chapter 8

CONCLUSIONS

At the beginning of this thesis, we set our goal to be the exploration of the knowledge which Chinese speakers have about the processes, participants and their relationships. In Chapter 2, the theoretical background of this thesis was outlined. In Chapter 3, previous works concerning the semantic relationships between processes and participants were discussed and compared with our approach. In Chapter 4, the categories and hierarchies of processes and participants, and other related information at the conceptual level were explored. In chapter 5, the structure and organization of such information in a Chinese dictionary were examined. In chapter 6, the types of participants which need to be specified in the conceptual frames and their difference from circumstances were investigated. In chapter 7, additional knowledge of the semantic relationships of processes to participants and among participants were represented.

This is the first systematic study on conceptual categories of processes and participants, and their correlations, based on a considerable number (300) of Chinese verbs. In other words, there has not been a detailed study of such a large data before. Although Teng (1975) and Li (1972) have attempted to categorize Chinese verbs and study the relations between verbs and nouns, i.e. case relations, they did not include so many verbs, nor did they focus on the
conceptual structure of processes and participants. As shown in 2.2, the chief purpose of Teng's study was to identify the semantic roles of noun phrases and Li's goal was to establish the cases proposed by Fillmore (1968). Our goal of this study has been to investigate the knowledge of Chinese speakers about processes and participants, and the conceptual relationships that exist between different categories of processes and participants, in producing and understanding Chinese texts, in order to account for the fact that Chinese does not have morphological means to indicate the relationships, but Chinese speakers do not have any difficulty in processing Chinese sentences. In particular, efforts have been made to construct a conceptual dictionary of Chinese to represent such knowledge.

Unlike previous studies, a cognitive approach was adopted in this study, i.e. the basic principles of cognitive linguistics were employed as our guiding principles. Specifically, we followed the version of cognitive linguistics of Lamb (1991). Using his theories, we studied the information system that enables Chinese speakers to use the language. We argued that the linguistic information exists in the mind of the speakers in the form of conceptual structure which contains categories and hierarchies, which in turn correlate with the relationships between processes and participant. Adopting the connectionist point of view, we treated concepts as notions and the hierarchical structure
and the relationships of processes to participants as connections between sections.

We demonstrated that there were three types knowledge which are present when Chinese speakers use the language: knowledge about the world, linguistic knowledge and pragmatic knowledge. Based on the semantic parameter PERIODICITY, four major categories of processes were derived: State, Status, Action and Event. Applying some semantic-conceptual criteria, we divided them into smaller groups. Although some previous approaches were partially incorporated in sorting out the categories of processes, our model focused on the semantic-conceptual properties of processes. In other words, even though some syntactic features correlated with these categories, they were not the main criteria for our categorization. In addition, the relation of subordination and part-whole relation were explored. We found that, like participants, processes also had a hierarchical structure and part-whole relations, which conforms to Lakoff's (1987:47) observation. Furthermore, we treated word order as part of the knowledge, i.e. the speakers know the particular order in which a process and its participants are lexically realized. We also argued that pragmatic knowledge also played a role in enabling the speakers to use the language in appropriate contexts.

Using formulaic notation, we built a conceptual dictionary of Chinese, which was based the three types of
knowledge. In the dictionary, categories of processes and participants and their hierarchical structures were included. In addition, we treated the patterns of processes cooccurring with participants as the connections between notions of conceptual processes and participants. We used conceptual frames to represent such connections in the dictionary. It was shown that a verb could be the realization of more than one conceptual process, and one conceptual process could be realized by more than one lexical verb. Therefore, multiple entries were posited for some lexical verbs, whereas the multiple realizations of a single conceptual process were associated with some pragmatic factors.

In the conceptual frames, the participants specified were limited to the positionally marked participants (i.e. the ones that are syntactically recognized as central) since the peripheral participants of a process could be marked by the prepositions in Chinese. In other words, peripheral participants were related to the process by prepositions because the role of each type of peripheral participant was signaled by a certain type of preposition. Accordingly, the conceptual structure of prepositions in Chinese was included in the conceptual dictionary. Moreover, the distinction between circumstancials and participants was determined on the basis of individual processes. So there was no general rule that could be formulated. We accounted for the diversity of relations between verb and noun (which have generated disputes
among linguists) by differentiating prototypical uses and non-
prototypical uses of processes. We found that non-
prototypical uses of processes were restricted to some Action
processes.

As argued in 6.4, the categories of participants given in
most conceptual frames should be interpreted as the prototypes
in order to account for metaphorical uses and the fact that
non-prototypical instances of a category were excluded in
certain frames. For a small number of processes, their second
participant was not a prototype, but fixed to some extent.
The cognate participant of some processes was one of them. In
some frames, the cognate participant was optional. In the
idiomatic expressions, the second participant was not
separable from the process and its meaning was not analyzable.
Accordingly, they were treated as having only one participant.
Other processes like EAT and DRINK, etc. were shown to have
default participants, i.e. the speakers know what should be
the participant if it is not given.

In addition to the categories and hierarchies of
processes and participants, Chinese speakers also know the
conceptual relationships that exist between the process and
its participant(s) in a conceptual frame in order to
understand Chinese clauses. We have shown that the
prototypical conceptual relationships of processes to
participants found in one major category were different from
those in another. The conceptual roles of the participants
were, in fact, derived from their conceptual relationships to processes. Accordingly, some of the subcategories of the four major groups of processes were labeled with the name of the conceptual relationship in their frames. Moreover, it was argued that the users of Chinese also knew the conceptual relationships between participants in some cases, particularly in Relational processes and some Event processes. Some kind of a hierarchical structure was also posited for the conceptual roles.

The cognitive approach adopted in our study, i.e. information-based and user-based approach, has in fact enabled us to look at some aspects of processes and participants which have not been examined before, e.g. the hierarchical structure and part-whole relations of processes in Chinese. Moreover, it has also provided a new perspective on a much-disputed phenomenon in Chinese, e.g. the diversity of relations between verbs and nouns. By distinguishing prototypical uses and non-prototypical uses of processes, this phenomenon has been accounted for and treated as additional information in the conceptual frames of some processes.

In sorting out the categories and hierarchy of processes, this study has also incorporated the theories and findings of some previous studies. However, it concentrated on those aspects that were compatible with our cognitive approach. In addition, it went beyond them in its scope and analysis. As stated before, no one has systematically examined the
conceptual properties of as many as 300 verbs in Chinese. Moreover, we have arrived a different classification of Chinese processes than Huang (1985) although the same criterion of PERIODICITY was applied, e.g. she posited three groups of verbs along the scale of periodicity, while our model has posited four groups of processes along the same scale, which were found to correlate with their compatibility with Chinese aspectual markers and the prototypical conceptual roles of their presupposed participants. Furthermore, the cognitive approach has also furnished a unified way of treating various aspects of Chinese together. By modeling the knowledge of Chinese speakers and representing it in a conceptual dictionary, we have, in addition to the categories, hierarchies, part-whole relations of processes and relationships of processes to participants, incorporated the use of prepositions, the unmarked order of lexical realizations and pragmatic uses as part of the knowledge. Accordingly, our cognitive approach has been broader in scope than previous studies.

Finally, the cognitive approach will facilitate future studies on the conceptual structure of processes and participants in Chinese. Modeling the dynamic and the analogical nature of linguistic knowledge, it allows expansion at any time. In addition, new categorizations and analysis can be incorporated by allowing redundancy in the dictionary. One of the areas that needs further studies is the
hierarchical structure of processes and the part-whole relations among them. We believe that a better understanding of these will provide a more systematic way of dealing with things like feature inheritance, etc. in modeling the knowledge of the speakers.
PART II: THE CONCEPTUAL DICTIONARY OF CHINESE

Symbols:

[] cognate deletable
() default
'' cognate
() any of the categories
/ in the context of
<> presupposed prototypical participant(s)
--> having the same participant(s) as
+ and
| and/or
! except
^ or
A:X X is an instance of A
X,Y,Z,... variables
R(X) the realization of X
CL Chinese lexeme
SUP supercategory
SUB subcategory

I. CONCEPTUAL STRUCTURE OF PARTICIPANTS IN CHINESE

THING
SUB: CONCRETE, ABSTRACT
CL: shìwù

ABSTRACT
SUP: THING
SUB:
CL: chōuxiàngshìwù

CONCRETE
SUP: THING
SUB: LIVING, NON-LIVING
CL: jùtīshìwù

LIVING
SUP: CONCRETE
SUB: ANIMATE, PLANT
CL: shēngwù

NON-LIVING
SUP: CONCRETE
SUB:
CL: fēishēngwù
ANIMATE
SUP: LIVING
SUB: ANIMAL, HUMAN
CL: dòngwù

HUMAN
SUP: ANIMATE
SUB: PROFESSIONAL, KINSHIP, ...
CL: rén

PROFESSIONAL
SUP: HUMAN
SUB: LAWYER, DOCTOR, ...
CL: zhuānyèrén

LAWYER
SUP: PROFESSIONAL
CL: lùshì

DOCTOR
SUP: PROFESSIONAL
CL: yīshēng

KINSHIP
SUP: HUMAN
SUB: FAMILY-MEMBER, RELATIVE, ...
CL: qínshū

FAMILY-MEMBER
SUP: KINSHIP
SUB: FATHER, MOTHER, BROTHER, ...
CL: jiātìngchéngyuán

FATHER
SUP: FAMILY-MEMBER
CL: bàba

RELATIVE
SUP: KINSHIP
SUB: UNCLE, NIECE, ...
CL: qīngqī

UNCLE
SUP: RELATIVE
CL: shūshū

ANIMAL
SUP: ANIMATE
SUB: DOMESTIC, LIVESTOCK, WILD, ...
CL: chūshēng

WILD-ANIMAL
SUP: ANIMAL
SUB: TIGER, LION, ELEPHANT
CL: yéshēngdòngwù

TIGER
SUP: WILD-ANIMAL
CL: láohū

PLANT
SUP: LIVING
SUB: FLOWER, GRASS, SHRUB, ...
CL: zhíwù

FLOWER
SUP: PLANT
SUB: ROSE, AZALEA, PLUM,
CL: huā

AZALEA
SUP: FLOWER
CL: dùjuān

ROSE
SUP: FLOWER
CL: méiguī

ARTIFACT
SUP: NON-LIVING
SUB: OBJECT, INSTITUTION, BUILDING, ...
CL: réngōngshíwù

OBJECT
SUP: ARTIFACT
SUB: MACHINE, GOODS, TOOL, ...
CL: wùpǐn

FOOD
SUP: OBJECT
SUB: MEAT, BREAD, NOODLE, ...
CL: shípǐn

MEAT
SUP: FOOD
SUB: PORK, BEEF, FISH, ...
CL: ròu

BEEF
SUP: MEAT
CL: niúròu

BREAD
SUP: FOOD
CL: miànbāo

MACHINE
SUP: OBJECT
SUB: VEHICLE, APPLIANCE, ...
CL: jīqì

CAR
SUP: MACHINE
SUB: TOYOTA, HONDA, ...
CL: qīchē

TOOL
SUP: OBJECT
SUB: SAW, HAMMER, SCREWDRIVER, ...
CL: gōngjù

SAW
SUP: TOOL
CL: jùzi

HAMMER
SUP: TOOL
CL: lángtou

INSTITUTION
SUP: ARTIFACT
SUB: COMPANY, SCHOOL, BANK, ...
CL: jīgòu

COMPANY
SUP: INSTITUTION
CL: gōngsī

BANK
SUP: INSTITUTION
CL: yínháng

BUILDING
SUP: ARTIFACT
SUB: BRIDGE, HOUSE, TOWER, ...
CL: jiànzhù

BRIDGE
SUP: BUILDING
CL: qiáo

HOUSE
SUP: BUILDING
CL: fángzi

NATURAL
SUP: NON-LIVING
SUB: CELESTIAL, MATERIAL, ...
CL: tiānránwù

CELESTIAL
SUP: NATURAL
SUB: SUN, MOON, STAR, ...
CL: tiāntī

SUN
SUP: CELESTIAL
CL: tàiyáng

MOON
SUP: CELESTIAL
CL: yuèliàng

MATERIAL
SUP: NATURAL
SUB: OIL, MINERAL, GAS, ...
CL: yuánliào

OIL
SUP: MATERIAL
CL: shíyóu

MINERAL
SUP: MATERIAL
CL: kuàngwù

TIME
SUB: TODAY, AFTERNOON, ...
CL: shíjiān

TODAY
SUP: TIME
CL: jìntiān

AFTERNOON
SUP: TIME
CL: xiàwǔ

PLACE
SUP: CONCRETE
CL: dìdiān
II: CONCEPTUAL STRUCTURE OF PROCESSES IN CHINESE

1. STATE

Relational:

shi 'to be'
BE <Token:THING:X Value:THING:Y>
R(X) shì R(Y)

xing 'to be surnamed'
BE-SURNAMED <Token:HUMAN:X Value:SURNAME:Y>
R(X) xìng R(Y)

guixìng 'to be surnamed'
BE-SURNAMED <[ADDRESSEE]> /Polite Question
[nin] guixìng

xiàng 'to resemble'
RESEMBLE --> BE
děngyú 'to equal to'
EQUAL-TO --> BE

jiào-1 'to be named'
BE-NAMED <Token:HUMAN:X Value:NAME:Y>
R(X) jiào R(Y)

Existential:
zài 'to be at/in'
BE-IN/AT <Existent:THING:X Location:THING:Y>
R(X) zài R(Y)

cúnzài 'to exist'
EXIST <Existent:THING:X>

yǒu 'there is/are'
THERE-IS/ARE <Location:[PLACE:X]
Existent:THING:Y>
R(X) yǒu R(Y)

Quality:
dà 'to be big'
BE-BIG <Token:THING:X>
R(X) dà

zhòng 'to heavy'
BE-HEAVY <Token:CONCRETE:X>
R(X) zhòng

gāo 'to be high/tall'
BE-BIG/TALL <Token:THING:X>
R(X) gāo

cōngmíng 'to be intelligent'
BE-INTELLIGENT <Token:HUMAN:X>
R(X) cōngmíng

bèn 'to be stupid'
BE-STUPID --> BE-INTELLIGENT

shǎ 'to be foolish'
BE-FOOLISH --> BE-STUPID

lǎn 'to be lazy'
BE-LAZY <Token:ANIMATE:X>
R(X) lǎn

hǎo 'to be good'
BE-GOOD <Token:THING:X>
R(X) hǎo
huài 'to be bad'
BE-BAD --> BE-GOOD

gòu 'to be enough'
BE-ENOUGH --> BE-GOOD

zhí 'to be worth (money)'
BE-WORTH-MONEY --> BE-HEAVY

měi 'to be beautiful'
BE-BEAUTIFUL --> BE-HEAVY

Possession:
yǒu 'to have'
HAVE <Possessor:THING:X Possessed:THING:Y>
R(X) yǒu R(Y)

shùyǔ 'to belong to'
BELONG-TO <Possessed:THING:X
Possessor:(PLACE,HUMAN,INSTITUTION):Y>
R(X) shùyǔ R(Y)

2. STATUS

Experiential

Physical:
máng 'to be busy'
BE-BUSY <Experiencer:HUMAN:X>
R(X) máng

xǐng 'to be awake'
WAKE-UP <Experiencer:ANIMATE:X>
R(X) xǐng

chídào 'to be late'
BE-LATE --> BE-BUSY

téng-1 'to hurt'
HURT <Conditioned:BODY-PART:X>
R(X) téng

téng-2 'to feel pain'
FEEL-PAIN --> BE-BUSY
R(X) téng

lèi 'to be tired'
BE-TIRED <Experiencer:ANIMATE:X>
R(X) lèi

bǎo 'to have enough (food)'
HAVE-ENOUGH --> BE-TIRED

yǎng 'to itch'
ITCH --> HURT

suān 'to tingle'
TINGLE --> HURT

d 'to feel hungry'
FEEL-HUNGRY --> BE-TIRED

lěng-2 'to feel cold'
FEEL-COLD --> BE-TIRED
I:X lěng

rè-2 'to feel hot'
FEEL-HOT --> BE-TIRED

huó 'to be alive'
BE-ALIVE <Experiencer:LIVING:X>
R(X) huó

Mental:

shāngxīn 'to be sad'
BE-SAD <Experiencer:HUMAN:X>
R(X) shāngxīn

nánguò 'to feel sorry'
FEEL-SORRY --> BE-SAD

gāoxìng 'to be happy'
BE-HAPPY --> BE-SAD

jídōng 'to be excited'
BE-EXCITED --> BE-SAD

pà-1 'to be afraid'
BE-AFRAID --> BE-SAD

pà-2 'to fear'
FEAR <Experiencer:ANIMATE:X
Phenomenon:THING:Y>
R(X) pà R(Y)

chóu 'to be worried'
BE-WORRIED --> BE-SAD

chìcù 'to be jealous'
BE-JEALOUS --> BE-SAD

ài 'to love'
R(X) ài R(Y)

rè'ai 'to have affection for'
R(X) rè'ai R(Y)

hèn 'to hate'
HATE --> LOVE

xīhuān 'to like'
LIKE <Experiencer:HUMAN:X Phenomenon:THING:Y>
R(X) xīhuān R(Y)

pàn 'to long for'
LONG-FOR --> LOVE

tǎoyàn 'to dislike'
DISLIKE --> LIKE

xiǎng 'to miss'
MISS <Experiencer:HUMAN:X Phenomenon:(HUMAN,PLACE):Y>
R(X) xiǎng R(Y)

téng-3 'to be fond of'
BE-FOND-OF --> LOVE

diànji 'to be concerned about'
BE-CONCERNED-ABOUT --> LIKE

Cognitive

wàng 'to forget'
FORGET <Experiencer:HUMAN:X Phenomenon:THING:Y>
R(X) wàng R(Y)

jídé 'to remember'
REMEMBER --> FORGET

zhídào 'to know'
KNOW <Experiencer:HUMAN:X Phenomenon:(HUMAN,ABSTRACT):Y>
R(X) zhídào R(Y)

rènshì 'to know'
KNOW <Experiencer:HUMAN:X Phenomenon:(PLACE,HUMAN,STREET,ROAD):Y>
R(X) rènshi R(Y)

huáiyì 'to doubt'
DOUBT --> KNOW

xiāngxīn 'to believe'
BELIEVE --> KNOW

fāxiàn 'to discover/find'
DISCOVER/FIND --> FORGET

zài hu 'to care about'
CARE-ABOUT <Experiencer:HUMAN:X
Phenomenon:THING:Y>
R(X) zài hu R(Y)

Condition:

lěng-1 'to be cold'
BE-COLD <Conditioned:TIME|PLACE|WEATHER:X>
R(X) lěng

rè-1 'to be hot'
BE-COLD <Conditioned:NON-LIVING:X>
R(X)

liáng 'to be cold'
BE-COLD --> BE-HOT-1

cháo 'to be moist'
BE-MOIST --> BE-HOT-1

shī 'to be wet'
BE-WET --> BE-HOT-1

gān 'to be dry'
BE-DRY --> BE-HOT-1

lòu 'to leak'
LEAK --> BE-HOT-1

kuài 'to be fast'
FAST --> BE-HOT-1

3. ACTION

Behavioral

Nature:

xià 'to fall'
FALL <Actor:(SNOW,RAIN,FOG,FROST,HAILSTONE):X>
xià R(X)

guā 'to blow'
BLOW <Actor:(WIND, TYphoon, TORNADO):X>
guā R(X)

dā 'to strike'
STRIKE <Actor: THUNDER:X>
dā R(X)

shān 'to flash'
FLASH <Actor: LIGHTENING:X>
shān R(X)

Human:

Physical

xiào-1 'to smile/laugh'
SMILE/ LAUGH <Agent: HUMAN:X>

R(X) xiào

gōngzuò 'to work'
WORK --> LAUGH-1

xiào-2 'to laugh at'
LAUGH-AT <Agent: HUMAN:X Goal: HUMAN:Y>
R(X) xiào R(Y)

kū 'to cry/weep'
CRY/ WEEP --> LAUGH-1

kěsòu 'to cough'
COUGH --> LAUGH-1

tànqí 'to sigh'
SIGH --> LAUGH-1

zuòmèng 'to dream'
DREAM --> LAUGH-1

qìn 'to kiss'
KISS <Agent: HUMAN:X Patient: HUMAN:Y>
R(X) qìn R(Y)

wánr-1 'to play'
PLAY --> LAUGH-1

wánr-2 'to play with'
PLAY-WITH <Agent: HUMAN:X
Goal: (GAMES, ANIMALS, OBJECT):Y>
R(X) wánr R(Y)

cháó 'to quarrel'
QUARREL --> LAUGH-1

chuăn 'to gasp'
GASP <Agent:HUMAN:X Range:[qi]> R(X) chuăn

chuiniu 'to boast'
BOAST --> LAUGH-1

móceng 'to dawdle'
DAWDLE --> LAUGH-1

răng 'to shout'
SHOUT --> LAUGH-1

Perceptual

kán-1 'to look at/watch'
LOOK-AT/WATCH <Agent:HUMAN:X Goal:CONCRETE:Y>
R(X) kán R(Y)

kán-2 'to read'
READ <Agent:HUMAN:X Goal:WRITTEN-DISCOURSE:Y>
R(X) kán R(Y)

tíng 'to listen to'
LISTEN-TO <Agent:HUMAN:X Goal:(SPOKEN-DISCOURSE,MUSIC,MEDIA):Y>
R(X) tíng R(Y)

mó 'to touch'
TOUCH --> KISS

cháng 'to taste'
TASTE <Agent:HUMAN:X
Patient:(FOOD,FRUIT,BEVERAGE):Y>
R(X) cháng R(Y)

díng 'to stare at'
STARE-AT --> LOOK-AT

Verbal

shuō 'to say/speak'
SAY/SPEAK <Agent:HUMAN:X Goal:SPOKEN-DISCOURSE:Y>
R(X) shuō R(Y)

jiāng 'to say/speak'
SAY/SPEAK --> SAY/SPEAK

tán 'to talk about'
TALK-ABOUT <Agent:HUMAN:X Goal:THING:Y>
R(X) tán R(Y)

tíqǐ 'to mention'
MENTION --> TALK-ABOUT

mà 'to abuse'
ABUSE <Agent:HUMAN:X Goal:HUMAN:Y>
R(X) mà R(Y)

jiào-1 'to call'
CALL --> ABUSE

dú-1 'to read aloud'
READ-ALOUD --> READ

liáo 'to chat'
CHAT <Agent:HUMAN:X>
R(X) liáo

Emotion

shēngqì 'to get angry'
GET-ANGRY <Agent:HUMAN:X>
R(X) shēngqì

fāhuǒ 'to lose temper'
LOSE-TEMPER --> GET-ANGRY

Cognitive

cāi 'to guess'
GUESS <Agent:HUMAN:X Goal:RIDDLES:Y>
R(X) cāi R(Y)

guījì 'to estimate'
ESTIMATE <Agent:HUMAN:X Goal:ABSTRACT:Y>
R(X) guījì R(Y)

kǎolǜ 'to consider'
CONSIDER --> ESTIMATE

Act

Dynamic

pǎo 'to run'
RUN <Agent:ANIMATE:X>
R(X) pǎo

jiào-2 'to shout/cry'
SHOUT/CRY --> RUN

tiào 'to jump'
JUMP --> RUN

bèng 'to leap'
LEAP --> RUN

fēi 'to fly'
FLY <(Actor:BIRD, INSECT, PLANE, KITE):X>
R(X) fēi

dòng 'to move'
MOVE --> RUN

pá 'to crawl'
CROWL --> RUN

táo 'to escape/flee'
ESCAPE/FLEE --> RUN

fēnbié 'to part'
PART <Agent:HUMAN:X>
R(X) fēnbié

fú 'to float'
FLOAT <Actor:CONCRETE:Y>
R(X) fú

gǔzhǎng 'to applaud'
APPLAUD --> PART

gǔn 'to roll'
ROLL <(Agent, Actor): (HUMAN, OBJECT):X>
R(X) gǔn

jiào-2 'to cry'
CRY --> RUN

Direction

gù 'to go'
GO <Agent: ANIMATE: X [PLACE: Y]>
I:X gù I:Y

lái 'to come'
COME --> gù

dào 'to reach'
REACH --> gù
hui 'to return'
RETURN --> qù

chū 'to go out'
GO-OUT --> qù

jin 'to enter'
ENTER --> qù

likāi 'to leave'
LEAVE --> qù

shàng 'to go up'
GO-UP --> qù

xià 'to go down'
GO-DOWN --> qù

Static:

shuí-1 'to sleep'
SLEEP <Agent:ANIMATE:X>
I:X shuí

shuí-2 'to sleep on'
SLEEP-ON <Agent:HUMAN:X Location:FURNITURE:Y>
I:X shuí I:Y

tāng 'to lie down'
LIE-DOWN --> SLEEP-1

zuò-1 'to sit'
SIT <Agent:HUMAN:X>
I:X zuò

zuò-2 'to sit on'
SIT --> SLEEP-2

dūn 'to squat down'
SQUAT-DOWN --> SIT-1

cáng 'to hide'
HIDE --> shuí-1

kào 'to lean against'
LEAN-AGAINST <Agent:HUMAN:X Patient:CONCRETE:Y>
I:X kào I:Y

zhù 'to live/reside'
LIVE/RESIDE <Agent:HUMAN:X Location:[PLACE]:Y>
I:X zhù I:Y
dāi 'to stay'
STAY --> SIT-1

pā 'to lie on one's stomach'
LIE-ON-STOMACH --> SIT

Creative

zào 'to build'
BUILD <(Agent: HUMAN, INSTITUTION): X
   Effect: (VEHICLES, MACHINES): Y>
R(X) zào R(Y)

zuò 'to make'
MAKE <Agent: HUMAN: X
   Effect: (FOOD, FURNITURE, CLOTHING): Y>
R(X) zuò R(Y)

xiě 'to write'
WRITE <Agent: HUMAN: X
   Effect: ((CHARACTER), WRITTEN-DISCOURSE): Y>
R(X) xiě R(Y)

huà 'to draw/paint'
DRAW/PAINT <Agent: HUMAN: X Effect: CONCRETE: Y>
R(X) huà R(Y)

shēng 'to give birth to'
GIVE-BIRTH <Agent: HUMAN: X Effect: CHILDREN: Y>
R(X) shēng R(Y)

shēngchăn 'to produce'
PRODUCE <(Agent: HUMAN, INSTITUTION): X
   Effect: (GOODS, MACHINES): Y>
R(X) shēngchăn R(Y)

gài-3 'to build'
BUILD <Agent: (HUMAN, INSTITUTION): X
   Effect: BUILDING: Y>
R(X) gài (Y)

niàng 'to brew/make'
BREW/MAKE <(Agent: HUMAN, BEE)
   Effect: (WINE, HONEY): Y>
R(X) niàng R(Y)

Affective

dǎ-1 'to hit'
HIT <Agent: HUMAN: X Patient: CONCRETE: Y>
R(X) dǎ R(Y)
tī 'to kick'
KICK <Agent:ANIMATE:X Patient:CONCRETE:Y>
R(X) tī R(Y)

kàn-2 'to visit'
VISIT <Agent:HUMAN:X Patient:HUMAN:Y>
R(X) kàn R(Y)

kān 'to look after'
LOOK-AFTER <Agent:ANIMATE:X Patient:CONCRETE:Y>
R(X) kān R(Y)

shèrù 'to ingest'
SUB: EAT
INGEST <Agent:ANIMATE:X Patient:CONCRETE:Y>

chī-1 'to eat'
SUP: INGEST
SUB: DEVOUR
COMPONENT: CHEW, SWALLOW
EAT <Agent:ANIMATE:X Patient:(FOOD, PLANT, FRUIT, ANIMAL, MEDICINE):Y>
R(X) chī R(Y)

chī-1 'to eat at'
EAT-AT <Agent:HUMAN:X Location:PLACE:Y>
R(X) chī R(Y)

chī-1 'to eat with'
EAT-WITH <Agent:HUMAN:X KITCHEN-UTENSIL:Y>
R(X) chī R(Y)

chī-2 'to suffer'
SUFFER <Agent:HUMAN:X Patient:HARDSHIP:Y>
R(X) chī R(Y)

chī-3 'to wipe out'
WIPE-OUT <Agent:HUMAN:X Patient:OPPONENT:Y>
R(X) chī R(Y)

yǎo 'to bite'
BITE <Agent:ANIMATE:X Patient:(ANIMATE, OBJECT):Y>
R(X) yǎo R(Y)

jiāo 'to turn in'
TURN-IN --> BITE

gāi-1 'to cover'
COVER <Agent:HUMAN:X Patient:OBJECT:Y>
R(X) gài R(Y)

gài-2 'to cover with'
COVER-WITH <Agent:HUMAN:X Instrument:OBJECT:Y>
R(X) gài R(Y)

hē 'to drink'
SUP: INGEST
SUB: SIP
DRINK <Agent:ANIMATE:X
Patient: ((WATER), BEVERAGE):Y>
R(X) hē R(Y)

mǐn 'to sip'
SUP: DRINK
SIP --> DRINK

jiáo 'to chew'
CONSTITUTE: EAT
CHEW --> EAT-1

yàn 'to swallow'
CONSTITUTE: EAT
SWALLOW --> EAT-1

tūn 'to devour'
SUP: EAT
DEVOUR --> EAT-1

lā 'to pull'
PULL <Agent:HUMAN:X Patient:OBJECT:Y>
R(X) lā R(Y)

zāi 'to plant'
PLANT <Agent:HUMAN:X Patient:PLANT:Y>
R(X) zāi R(Y)

xiū 'to repair'
REPAIR <Agent:HUMAN:X
Patient: (MACHINES, APPLIANCES, SHOES):Y>
R(X) xiū R(Y)

bān 'to move'
MOVE <Agent:HUMAN:X
Patient: ((FAMILY), OBJECT):Y>
R(X) bān R(Y)

tànɡ 'to iron'
IRON <Agent:HUMAN:X Patient:CLOTHING:Y>
R(X) tànɡ R(Y)

yún 'to iron'
IRON --> tàng

qiăng 'to rob'
ROB <Agent:HUMAN:X
Patient:(INSTITUTION,PROPERTIES):Y>
R(X) qiăng R(Y)

ná 'to take'
TAKE <Agent:HUMAN:X Patient:OBJECT:Y>
R(X) ná R(Y)

shuāi-2 'to throw onto the floor/ground'
THROW --> TAKE

xǐ-1 'to wash'
WASH <Agent:HUMAN:X Patient:(BODY-PART,OBJECT):Y>
R(X) xǐ R(Y)

zhuī 'to chase'
CHASE <Agent:ANIMATE:X Patient:ANIMATE:Y>
R(X) zhuī R(Y)

qí 'to ride'
RIDE <Agent:HUMAN:X Patient:(ANIMAL,BIKE):Y>
R(X) qí R(Y)

wā 'to dig'
DIG <Agent:ANIMATE:X Patient:NATURE:Y>
R(X) wā R(Y)

shā 'to kill'
KILL <Agent:HUMAN:X Patient:ANIMATE:Y>
R(X) shā R(Y)

zāi 'to slaughter/butcher'
SLAUGHTER/BUTCHER <Agent:HUMAN:X
Patient:ANIMAL:Y>
R(X) zāi R(Y)

shāo 'to burn'
BURN <Agent:HUMAN:Fire:X
Patient:NONLIVING:Y>
R(X) shāo R(Y)

kāng 'to carry on shoulder'
CARRY-ON-SHOULDER <Agent:HUMAN:X Patient:OBJECT!SPOKEN-DISCOURSE:Y> R(X) kāng R(Y)

jiān 'to pick up'
PICK-UP --> TAKE

tōu 'to steal'
STEAL --> TAKE

sòng-1 'to deliver'
SONG <Agent:HUMAN:X Patient:OBJECT:Y> R(X) sòng R(Y)

cānguān 'to visit'
VISIT <Agent:HUMAN:X Patient:PLACE:Y> R(X) cānguān R(Y)

cāi-1 'to pick'
PICK <Agent:HUMAN:X Patient:PLANT:Y> R(X) cāi R(Y)

cāi-2 'to gather'
GATHER <Actor:(BEE,BUTTERFLY):X Patient:(FLOWER,HONEY):Y> R(X) cāi R(Y)

cāi-3 'to extract'
EXTRACT <Agent:HUMAN:X Patient:MATATERIAL:Y> R(X) cāi R(Y)

yòng 'to use'
USE <Agent:HUMAN:X Patient:(MACHINE,TOOL,HOUSEHOLD-ITEMS):Y> R(X) yòng R(Y)

shī-2 'to use'
USE --> yòng/Spoken

shǐyòng 'to employ'
EMPLOY --> USE/Formal

shōu 'to collect'
COLLECT <Agent:HUMAN:X Patient:CONCRETE:Y> R(X) shōu R(Y)

chān 'to help by the arm'
HELP-BY-ARM <Agent:HUMAN:X Patient:HUMAN:Y> R(X)X chān R(Y)

dǎi 'to capture'
CAPTURE <Agent:HUMAN:X Patient:ANIMATE:Y>
R(X) dǎi R(Y)

dǎibī 'to arrest'
ARREST --> HELP-BY-THE-ARM

féng 'to stitch'
STITCH <Agent:HUMAN:X
Patient:(CLOTHING,WOUND):Y>
R(X) féng R(Y)

hài 'to do harm to'
DO-HARM-TO --> ARREST

jiù-1 'to save'
SAVE <Agent:THING:X
Patient:(HUMAN,PLACE,ABSTRACT):Y>
R(X) jiù R(Y)

kǎo-1 'to bake/roast'
BAKE/ROAST <Agent:HUMAN:X
Patient:(FOOD,CLOTHING):Y>
R(X) kǎo R(Y)

kǎo-2 'to warm (oneself) with'
WARM-WITH <Agent:HUMAN:X
Instrument:(FIRE,HEATER):Y>
R(X) kǎo R(Y)

xùn 'to tame/train'
TAME/TRAIN <Agent:HUMAN:X Patient:ANIMAL:Y>
R(X) xùn R(Y)

xùn 'to lecture'
LECTURE --> ARREST

xùnlìàn 'to train'
TRAIN --> ARREST

zhuǎng 'to install'
INSTALL <Agent:HUMAN:X Patient:OBJECT:Y>
R(X) zhuǎng R(Y)

zhuō 'to catch'
CATCH <Agent:ANIMATE:X Patient:ANIMATE:Y>
R(X) zhuō R(Y)

yānhū 'to shield/cover'
SHIELD/COVER --> ARREST

yōngbào 'to embrace'
EMBRACE --> ARREST
yóulăn 'to tour/visit'
TOUR/VISIT --> VISIT

zăn 'to save'
SAVE <Agent:HUMAN:X Patient:(GOODS,MONEY):Y> 
R(X) zăn R(Y)

zhà 'to blow up/blast'
BLOW-UP/BLAST --> KICK

zhá 'to fry in oil'
FRY-IN-OIL <Agent:HUMAN:X Patient:FOOD:Y> 
R(X) zhá R(Y)

jū 'to lift'
LIFT --> COLLECT

zhăodài 'to entertain'
ENTERTAIN --> HIT

kuăndài 'to treat'
TREAT --> ENTERTAIN

juăn 'to donate'
DONATE --> SAVE

juăn 'to roll up'
ROLL-UP --> COLLECT

juē 'to break'
BREAK --> COLLECT

kai-1 'to open'
OPEN --> COLLECT

kai-2 'to drive/run'
DRIVE/RUN <Agent:HUMAN:X Patient:(MACHINE,VEHICLE):Y> 
R(X) kāi R(Y)

kăn 'to cut'
CUT --> COLLECT

kūn 'to bind'
BIND --> COLLECT

liăng 'to dry in the air'
DRY-IN-THE-AIR --> COLLECT

liăng 'to measure'
MEASURE --> COLLECT
lǐng 'to lead'
LEAD --> ARREST

lǒu 'to embrace'
EMBRACE --> ARREST

lūn 'to brandish'
BRANDISH --> COLLECT

mái 'to bury'
BURY --> HIT

máizàng 'to bury'
BURY --> HIT/Formal

míhuò 'to confuse'
CONFUSE --> ARREST

mǐnlì 'to encourage'
ENCOURAGE --> ARREST

mó 'to grind'
GRIND --> HIT

pāi 'to pat'
PAT --> HIT

pāi 'to dispatch'
DISPATCH --> ARREST

pāoqì 'to abandon'
ABANDON --> ARREST

pào 'to soak'
SOAK --> COLLECT

pèi 'to accompany'
ACCOMPANY --> ARREST

pèiyǎng 'to foster'
FOSTER --> ACCOMPANY

piān 'to deceive'
DECEIVE --> ACCOMPANY/Formal

qī 'to paint'
PAINT --> COLLECT

qiāo 'to knock'
KNOCK --> COLLECT
qū 'to get'
GET --> COLLECT

rǎoluàn 'to harass'
HARASS --> HIT

Range

chàng 'to sing'
SING <Agent:HUMAN:X [SONG]:Y> 
R(X) chàng R(Y)

yóu 'to swim'
SWIM <Agent:HUMAN:X [SWIM]:Y> 
R(X) yóu R(Y)

tiào 'to dance'
DANCE <Agent:HUMAN:X [DANCE]:Y> 
R(X) tiào R(Y)

jiāo-2 'to make (friends)'
MAKE <Agent:HUMAN:X 'FRIEND':Y> 
R(X) jiāo R(Y)

kǎo 'to exam'
EXAM <Agent:HUMAN:X 'TEST':Y> 
R(X) kǎo R(Y)

juē-2 'to pout'
POUT <Agent:HUMAN:X 'MOUTH':Y> 
R(X) juē R(Y)

kuà 'to step'
STEP <Agent:HUMAN:X 'STEP':Y> 
R(X) kuà R(Y)

liū 'to skate'
SKATE <A HUMAN:X 'ICE':Y> 
R(X) liū R(Y)

mì 'to narrow'
NARROW <Agent:HUMAN:X 'EYE':Y> 
R(X) mì R(Y)

Goal

jiānchí 'to persist in'
PERSIST-IN <Agent:HUMAN:X Goal:ABSTRACT:Y> 
R(X) jiānchí R(Y)

cǎiqū 'to adopt'
ADOPT --> PERSIST-IN
jiǎngqìng 'to reduce'
REDUCE --> ADOPT

fāzhǎn 'to develop'
DEVELOP --> REDUCE

jiǎngjiù 'to stress'
STRESS --> DEVELOP

yuàn 'to blame'
BLAME <Agent:(HUMAN):X Goal:THING:Y>
R(X) yuàn R(Y)

jiāoliú 'to exchange'
EXCHANGE --> DEVELOP

jiāoshè 'to negotiate'
NEGOTIATE --> DEVELOP

jiālù 'to expose'
EXPOSE --> DEVELOP

jìnxing 'to carry on'
CARRY-ON --> EXPOSE

jiù-2 'to relive'
RELIEVE <Agent:HUMAN:X Goal:(FIRE,DISASTER):Y>
R(X) jiù R(Y)

dā-2 'to engage in'
ENGAGE-IN --> EXPOSE

dā-3 'to play'
PLAY <Agent:HUMAN:X Goal:(GAME,SPORTS,MARTIAL-ART):Y>
R(X) dā R(Y)

dā 'to do'
DO <Agent:HUMAN:X Goal:BEHAVIOR:Y>
R(X) dā R(Y)

jūjué 'to refuse'
REFUSE <Agent:HUMAN:X Goal:THING:Y>
R(X) jūjué R(Y)

kuā 'to praise'
PRAISE <Agent:HUMAN:X Goal:HUMAN:Y>
R(X) kuā R(Y)
lányòng 'to abuse'  
ABUSE --> EXPOSE

liyòng 'to utilize'  
UTILIZE --> EXPOSE

lièjū 'to enumerate'  
ENUMERATE --> EXPOSE

liúlù 'to reveal'  
REVEAL --> EXPOSE

mǎnzù 'to satisfy'  
SATISFY --> EXPOSE

máiyuàn 'to blame'  
BLAME --> PRAISE

màochōng 'to pretend to be'  
PRETEND-TO-BE --> PRAISE

měng 'to deceive'  
DECEIVE --> PRAISE

mìbù 'to make up'  
MAKE-UP --> EXPOSE

mòfāng 'to imitate'  
IMITATE <Agent:ANIMATE:X Goal:ANIMATE:Y>  
R(X) mòfāng R(Y)

pòchū 'to get rid of'  
GET-RID-OF --> EXPOSE

qiángdiào 'to emphasize'  
EMPHASIZE --> EXPOSE

shāngliáng 'to discuss'  
DISCUSS --> EXPOSE

Transaction

mǎi 'to buy'  
BUY <Agent:(HUMAN, INSTITUTION):X Exchange:CONCRETE:Y>  
R(X) mǎi R(Y)

gòumǎi 'to purchase'  
PURCHASE --> mǎi/Formal

mǎi 'to sell'
SELLE --> mài

fàn mái 'to peddle'
PEDDLE <Agent:HUMAN:X Exchange:THING:Y>
R(X) fàn mái R(Y)

dàng 'to pawn'
PAWN <Agent:HUMAN:X
Exchange:(BELONGINGS, HOUSEHOLD-ITEMS):Y>
R(X) dàng R(Y)

zǔ 'to rent/lease'
RENT/LEASE --> mài

Transfer

jiè 'to borrow'
BORROW <Agent:HUMAN:X Orientation:[HUMAN:Y]
Transferred:CONCRETE:Z>
R(X) jiè R(Y) R(Z)

huán 'to return'
RETURN --> jiè

sòng-2 'to give as gift'
GIVE-AS-GIFT <Agent:HUMAN:X Recipient::HUMAN:Y
Transferred:CONCRETE:Z>
R(X) sòng R(Y) R(Z)

zèng 'to give as gift'
GIVE-AS-GIFT --> GIVE-AS-GIFT/Formal

gěi 'to give'
GIVE --> GIVE-AS-GIFT

jiāo 'to teach'
TEACH <Agent:HUMAN:X Recipient:[HUMAN:Y]
Transferred:ABSTRACT:Z>
R(X) jiāo R(Y) R(Z)

gàosù 'to tell'
TELL <Agent:HUMAN:X Recipient:HUMAN:Y
Transferred:[(SPEECH, NEWS)]:Z>
R(X) gàosù R(Y) R(Z)

4. EVENT

Changes
biàn 'to change'
CHANGE <Ergatum:THING:X>
R(X) biàn

gǎibiàn-1 'to change'
CHANGE <Ergatum:ABSTRACT:X>
R(X) gǎibiàn

èhuà 'to worsen'
WORSEN --> CHANGE

gǎishàn-1 'to improve'
IMPROVE --> CHANGE

Inception
kāishī 'to begin'
BEGIN <Ergatum:(EPISODES, GAME):X>
R(X) kāishī

chūshēng 'to be born'
BE-BORN <Ergatum:HUMAN:X>
R(X) chūshēng

chūxiàn 'to emerge'
EMERGE <Ergatum:THING:X>
R(X) chūxiàn

Cessation
tīng-1 'to stop'
STOP <Ergatum:NONLIVING:X>
R(X) tīng

sǐ-1 'to die'
DIE <Ergatum:LIVING:X>
R(X) sǐ

sǐ-2 'to suffer the death'
SUFFER-DEATH<(Possessor+Maleficiary):HUMAN:X
Ergatum: FAMILY-MEMBER:Y>/Sympathetic
R(X) sǐ R(Y)

qūshī 'to pass away'
PASS-AWAY <Ergatum:HUMAN:X>/Formal
R(X) qūshī

shishī 'to pass away'
PASS-AWAY <Ergatum:HUMAN:X>/Honorific
R(X) shishī

wán-1 'to be through'
BE-THROUGH <HUMAN:X>
I:X wán

wán-2 'to be finished'
BE-FINISHED <Ergatum:THING:X>
R(X) wán

xiè 'to wither'
WITHER <Ergatum:FLOWER:X>
R(X) xiè

niān 'to wither'
WITHER <Ergatum:PLANT:X>
R(X) niān

jiéshù 'to end'
END <Ergatum:ABSTRACT:X>
R(X) jiéshù

daoda 'to arrive in/at'
ARRIVE-IN/AT <Ergatum:HUMAN:X
Destination:[PLACE:Y]>
R(X) daoda R(Y)

dadao 'to reach'
REACH <Ergatum:THING!ANIMATE:X
Destination:ABSTRACT:Y>
R(X) dadao R(Y)

Occurrence

fāshēng 'to occur'
OCCUR <Ergatum:(ACCIDENT,DISASTER):X>
R(X) fāshēng
fāshēng R(X)

dǎo 'to fall'
FALL <Ergatum:CONCRETE:X>
R(X) dǎo

kuǎ 'to collapse'
COLLAPSE <Ergatum:THING:X>
I:X kuǎ

diào 'to drop'
DROP --> FALL

pò 'to break'
BREAK <Ergatum:ARTIFACT:X>
R(X) pò
tā 'to collapse'
COLLAPSE <Ergatum:BUILDING:X>
R(X) tā

shuāi-1 'to fall down'
FALL-DOWN <Ergatum:HUMAN:X [jiāo]>
R(X) shuāi

bài 'to be defeated'
BE-DEFEATED <Ergatum:HUMAN:X>
R(X) bái

bào zhà 'to explode'
EXPLODE <(AMMUNITION,STORAGE):Y>
I:X bào zhà

liè to crack'
CRACK --> pò

kāi-8 'to blossom'
BLOSSOM <FLOWER:X>
R:X kāi

jiēhūn 'to get married'
GET-MARRIED <HUMAN:X>
R(X) jiēhūn

qǔ 'to marry'
MARRY <HUMAN:husband:X HUMAN:wife:Y>
R(X) qǔ R(Y)

jià 'to marry'
MARRY <HUMAN:WIFE:X HUMAN:HUSBAND:Y>
R(X) jià R(Y)

tuí-1 'to ebb'
EBB <cháoshuǐ, hóngshuǐ:X>
R(X) tuí

tuí-2 'to fade'
FADE <yánsè:X>
R(X) tuí

tuí-3 'to retreat'
RETREAT <HUMAN:X>
R(X) tuí

shībài 'to fail'
FAIL <THING:X>
R(X) shībài

pǎo-1 'to escape'
ESCAPE <ANIMATE:X>
R(X) pǎo

táo 'to escape'
ESCAPE <HUMAN:X>
R(X) táo

táopǎo 'to run away'
RUN-AWAY --> táo

zǒu 'to leave'
LEAVE <HUMAN:

pǒmiè 'to be shattered'
BE-SHATTERED <Ergatum:ABSTRACT:X>
R(X) pǒmiè

Acquisition

dé 'to get'
GET <Ergatum:HUMAN:X Goal:THING:Y>
R(X) de R(Y)

dédào 'to get/obtain'
GET/OBTAIN <Ergatum:HUMAN:X Goal:THING:Y>
R(X) dédào R(Y)

huòdé 'to get'
GET <Ergatum:HUMAN:X Goal:ABSTRACT:Y>
R(X) huòdè R(Y)

shǒudào 'to receive'
RECEIVE <Ergatum:HUMAN:X Goal:OBJECT:Y>
R(X) shǒudào R(Y)

yǐng 'to win'
WIN <Ergatum:HUMAN:X Goal:(GAME,SPORT,WAR):Y>
R(X) yǐng R(Y)

yǐngdé 'to win/gain'
WIN/GAIN <Ergatum:HUMAN:X Goal:ABSTRACT:Y>
R(X) yǐngdè R(Y)

Deprivation

diǔ 'to lose'
LOSE <Ergatum:HUMAN:X Goal:OBJECT:Y>
I:X diǔ I:Y

shǔ 'to lose (a game)'
LOSE <Ergatum:(HUMAN, INSTITUTION):X>  
Goal:[GAME, SPORT]:Y>  
R(X) shū R(Y)  

shíqu 'to lose'  
LOSE <Ergatum:THING:X>  
Goal:(HUMAN, ABSTRACT):Y>/Formal  
R(X) shíqu R(Y)  

Causation  

shǐ-1 'to cause'  
CAUSE <Causer:THING:X Causee:THING:Y>  
Caused:STATUS:Z>  
R(X) shǐ R(Y) R(Z)  

jiào 'to make sb do sth'  
Caused:(STATUS, EVENT, ACTION):Z>  
R(X) jiào R(Y) R(Z)  

ràng 'to make sb do sth'  
MAKE-DO --> jiào  

qiángpò 'to force sb to do sth'  
FORCE-DO --> jiào  

quàn 'to persuade sb to do sth'  
PERSUADE --> jiào  

yǔnxǔ 'to allow'  
ALLOW <Causer:(HUMAN, ABSTRACT):X>  
Causee:HUMAN:Y Caused:(EVENT, ACTION, STATUS:Z>  
R(X) yǔnxǔ R(Y) R(Z)  

tíng-2 'to stop'  
STOP <Causer:HUMAN:X>  
Causee:(VEHICLES, UTILITIES):Y>  
R(X) tíng R(Y)  

gǎishàn-2 'to improve'  
IMPROVE <Causer:HUMAN:X Causee:ABSTRACT:Y>  
R(X) gǎishàn R(Y)  

gǎibiàn 'to alter/change'  
ALTER/CHANGE --> IMPROVE  

III: CONCEPTUAL STRUCTURE OF PREPOSITIONS IN CHINESE  

AT/IN <Location:PLACE:X>  
zài R(X)
WITH <Instrument: CONCRETE: X>
vòng R(X)

WITH <Instrument: (TIME, MONEY): X>
huā R(X)

BY <Agent: THING: X>/Demoted
bèi R(X)
rang --> bèi
jià --> bèi
gēi --> bèi

<Patient: THING: X>/Given
bā R(X)
jiāng --> bā/Formal

FOR <Beneficiary: THING: X>
wèi R(X)
tī --> wèi
gēi --> wèi

FROM <Source: (HUMAN, INSTITUTION, PLACE): X>
cóng R(X)

TO <Recipient: HUMAN: X>
gēi R(X)

WITH <Accompaniment: HUMAN: X>
hé R(X)
gēn --> hé
tōng --> hé

TO <Destination: PLACE: X>
wàng R(X)
cháo --> wàng
daò --> wàng
Appendix 1:
A Partial Classification of Participants in Chinese
Appendix 2:
A Conceptual Categorization of Processes In Chinese
Allerton, D. J. (1978). The notion of 'givenness' and its relations to presupposition and to theme. Lingua 44: 133-68.


(1989c). The nature of grammatical valence. ditto. 91-126.


Simon, Herbert and Craig A. Kaplan (1989). Foundations of

Slobin, Dan I. (1982). The origins of grammatical encoding of
events. In Paul J. Hopper and Sandra A. Thompson, (eds).
pp. 409-422.

Processing in Mind and Machine. Reading, Mass.: Addison-Wesley.

Sullivan, William J. (1980). Syntax and linguistic semantics
in stratificational theory. In Edith A. Moravcsik and
Jessica R. Wirth, eds. 301-327.

Swiggers, Pierre (1988). Grammatical categories and human
conceptualization: Aristotle and Modistae. In Brygida
Rudzka-Ostyn ed. 621-646.

pp.49-72.

Relations in Chinese. Berkeley Publications in
Linguistics vol.80.

Klinksieck.

Heights, IL: Waveland Press, Inc.

Cornell University Press.

Verkuyl, H. J. (1972). On the Compositional Nature of the

Wang, Mingquan (1987). Transitivity and the ba-construction in

Dāpèi Cídiǎn (A Collocational Dictionary of Common

The Ohio State University Project on Linguistic Analysis,
No. 3. Columbus.

