Functionalism and Chinese Grammar

功能學說
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In this essay, I take the position that the fundamental function of language is to communicate ideas and that grammatical structures arise from the symbolization of reality. A non-objectivist philosophy which falls in between linguistic objectivism and linguistic relativism is proposed. My aim is to understand the structural principles of Chinese in terms of some basic human cognitive abilities pertaining to time and space in conjunction with general principles of communication. I follow a view shared by many cognitive psychologists and philosophers that the fundamental human perceptual strategies of time and space primarily result from the structure of the human body in its interaction with the physical world. It is demonstrated that the proposed approach allows the grammar of Chinese to be analyzed independent of grammatical categorization based on European languages. Different from the prevailing practices in syntax, I focus on linguistic disparities rather linguistic similarities as starting points to construct a grammar which is capable of revealing the underlying conceptual principles unique to the Chinese language. Those conceptual principles include an extension of Tai's (1985) temporal sequence principle, the whole-part relation, metaphorization based on spatial expressions, the salience principle, and the principle involving the notion of 'information center.' In essence, I propose a philosophy, a method, and a new approach to grammatical analysis for Chinese, which I hope can be applied to other languages as well.

In Section 1, I present a non-objectivist philosophy of grammatical analysis in which surface syntactic structures are taken to represent semantic structure directly, and semantic structures are equated with conceptual structures. Section 2 uncovers the conceptual principles underlying Chinese sentences expressing locations and spatial relations. Section 3 explicates the explanatory value of Tai's temporal sequence principle in Chinese word order in conjunction with some putative functional principles. Section 4 deals with those temporal expressions which can be analyzed in light of the metaphorization of spatial expressions; the notion of temporal for Chinese
word order; some systematical differences between Chinese and English regarding time as a spatial metaphors are made. In Section 5, I draw a few conclusions, suggesting a way to search for language universals by means of the proposed non-transformational cognition-based functional theory of grammar.

1. A Non-Objectivist Philosophy

Language is the main vehicle of human communication. In speaking, we put ideas into words to convey to other people what we do, feel, see, think and intend to do. In listening, we turn words into ideas to grasp what other people want us to know about their actions, feelings, perceptions, thoughts and intentions. Insofar as the fundamental, if not the sole, function of language is to communicate ideas, the central inquiry in linguistics should center around the comprehensive question about the relation among language, thought, and reality. Yet, the fundamental function of language in human communication has virtually been ignored in the mainstream of modern structural linguistics, from Saussure to Bloomfield and then to Chomsky. As pointed out by Hsieh (1978), the study of the symbolization of reality by language has in general been more enthusiastically pursued by anthropologists, philosophers, and psychologists than by linguists. With the rare exception of Benjamin Whorf, linguists have shunned away from the study of language as a symbolic system capable of reflecting culture.

Very recently, however, several linguists including Haiman (1985, 1986), Lakoff (1987), and Langacker (1987) among others have begun to take Whorf's view of language as a symbolization of reality more seriously. They attempt to redirect the current dominant thinking in grammatical theories by arguing that grammar is not an arbitrary and autonomous formal system, but inherently a symbolic representation of conceptualized reality. They have in different manners demonstrated that significant generalizations and natural explanations for linguistic structures, particularly syntactic structures, can be obtained only by looking at the language as a symbolization of the conceptual content structured according to cultural convention in a given society. This essay is an attempt to show that significant generalizations of great explanatory value in Chinese grammar can be obtained only by viewing the unique characteristics exhibited in this grammar as reflecting Chinese conceptualizations of reality.

In the tradition of structural linguistics, language is an arbitrary, autonomous, and self-contained formal system of rules. Therefore, it suffices to investigate the formal structure of the human language without taking into consideration its function in human communication. Inheriting this fundamental assumption from the American structuralist tradition, Chomsky makes a further claim that this system of rules (modules and principles in his government and binding theory) universally underlies all human languages and reflects human innate language faculty. In particular, this innate language faculty is independent of other systems of cognition in human beings, including the perceptual system. Thus, to Chomsky and his followers, it is through the construction of abstract principles governing all human languages, particularly syntactic principles, that we can hope to bring to light some inherent properties of the human mind, or more concretely, the human brain. Chomsky's innateness hypothesis has profound impact on various contemporary philosophical and psychological issues concerning the nature of human beings. Admittedly, his approach to studying the innate system underlying human languages has greatly widened the vision and purview of linguists and has led to the discovery of some fundamental universal properties of human languages. However, it has also steered the efforts of the majority of linguists in the past two decades away from looking into different languages as representing different systems of conceptualization of the real world. One of the fundamental tenets held firmly by GB practitioners is that once we analyze one single language, i.e., English, in great detail to discover the abstract principles governing English grammar, given the innateness hypothesis, we can assume they probably would also exhibit in other human languages including Chinese. Whatever the differences between Chinese and English we may find, they can be accounted for by fixing a small set of parameters in the universal 'core grammar.' These parameters, in the form of abstract formal principles, are also innate. They have nothing to do with different conceptualizations of reality in different cultures.

In addition to Chomsky's GB theory, several other formal grammatical theories have been developed in this country during the past two decades. Because of the limit of space, we will not be able to evaluate each of them. For the purpose of clarifying the central issue at stake, it suffices to mention Categorial Grammar, which has evolved from Montague Grammar in recent years, and other grammars which are based on truth-conditional semantics and model-theoretic semantics. Truth-conditional semantics holds that to understand the meaning of a sentence is to know what the world would have to be for the sentence to be true; model-theoretic semantics is a method to carry out the program of truth-conditional semantics. It involves the construction of abstract mathematical models of those things in the world making up the semantic values of expressions in the object language. Truth-
conditional semantics and model-theoretic semantics together give a rigorous and elaborate account of semantics and syntax at the same time. They represent an elegant approach to characterize human communication by language. Formally elegant and rigorous as they are, they have implicitly or explicitly adopted a correspondence theory of meaning, truth, and knowledge. They assume that words are arbitrary symbols which are meaningless themselves and are made meaningful only by being associated with things in the world. They also assume that rational reasoning involves the algorithmic manipulation of arbitrary abstract symbols in the mathematical sense. Indeed, this kind of correspondence theory of meaning has dominated the Western philosophical tradition since the 19th century.

Very recently Johnson (1987) and Lakoff (1987) have referred to this dominant Western philosophical tradition as 'objectivism' and 'objectivist cognition,' since this tradition regards meaning as an abstract relation between symbolic representations and the objective reality, and since it doesn't properly recognize the role of human experience, imagination, and creativity in our understanding of reality. From the viewpoint of human communication, while the truth-conditional semantics and model-theoretic semantics have provided a rigorous model of human communication regarding the physical objects in the world, their objectivist view has neglected human's endowed ability to conceptualize the same situation in different ways, according to different conceptual systems underlying different languages in different cultures. Johnson and Lakoff have stopped short of referring to Chomsky's theory as an objectivist view of cognition. However, Chomsky's theory treats language differences as resulting from various ways of selecting a small number of innate parameters rather than from different conceptualizations of reality. To that extent, it stands on the very foundation of an objectivist cognition. In this essay, we strongly object to the paradigm of objectivist cognition; we agree with Langacker (1987) that meaning is not equated with truth condition but with cognitive processing, i.e., construing of the objective reality by means of conventional imagery, and that grammatical structure embodies conventional imagery. Therefore, we contend that different cultures have different linguistic semantics and consequently have different grammatical structures. We will demonstrate that this relativist view of linguistic semantics can lead us to many revealing and natural analyses of Chinese, especially in those areas where Chinese is drastically different from English.

Due to the objectivism underlying the tradition of linguistic analysis on the one hand, and the absence of an indigenous Chinese grammar on the other, research on Chinese grammar since Mashì Wentong in 1898 has invariably been based on grammatical theories derived from studies on Indo-European languages. The influence of American grammatical theories, traditional or contemporary, is particularly notable. It is no accident that Chinese grammarians have relied heavily on English translations and on grammatical theories of English to analyze Chinese. It is not surprising at all that the result of this objectivist approach shows that Chinese and English are fundamentally not different in grammatical structures. For this translation-and-analysis approach assumes that Chinese and English are not different in semantics. It is only when Chinese grammarians are faced with some obvious distinctive characteristics of Chinese grammar which resist a Western method of analysis that they begin to question the validity of the method. The wholesale application of the 'parts of speech' is a case in point. Since Chinese lacks morphology, the 'parts of speech' can at most be understood notionally or in terms of grammatical functions. Thus, the category of 'coverb' in place of the category of 'preposition' is introduced to account for the apparent different behaviors between English prepositions and their supposed equivalents in Chinese. English predicative adjectives is recognized as stative verbs in Chinese, since they require no co-occurrence of the copula verb 'to be.' In spite of these and other similar modifications in grammatical descriptions, Chinese grammarians have largely relied on theories developed for European languages, particularly English. They have not even attempted to obtain a framework of analysis which is neutral and unbiased for the analysis of all natural languages. It is not trivial at all to point out here that since translations from Chinese to English in general encounter no grave obstacles, very few Chinese grammarians have shown even the slightest hesitation in relying on translation. There is nothing wrong with using translation as a heuristic device. What is objectionable is that Chinese grammarians, including current GB practitioners, have simply superimposed English structures on Chinese sentences viewed as English translation. The result is, not surprisingly, that Chinese appears to exhibit essentially the same properties as English.

In this essay, we wish to develop an approach largely independent of Western grammatical traditions and theories, an approach that will allow us to look at Chinese sentences as they are, without the veil of English translation. This approach will enable us to uncover the conceptual system underlying Chinese grammar and thereby to see in what respects the Chinese conceptual system is similar to and in what respects it is different from the conceptual system underlying English grammar. Since the proposed approach is based on a non-objectivist view which recognizes culturally-dependent linguistic semantics which provide motivations for the structural principles governing Chinese grammar, we will hereafter refer to this approach as a
"non-objectivist view" of Chinese grammar. This non-objectivist view is unbiased and indeed objective in that it frees the analysis of Chinese grammar from the confinement of Western theories, and in that it interprets grammatical structures of Chinese in terms of basic human perceptual abilities, especially with respect to space and time. However, in strategy, we will use language disparities rather than similarities as our starting point. In doing so, we will be able to use grammatical features unique to Chinese as an orientation point to uncover conceptual principles unique to this language. The present approach is thus radically different from the currently dominant linguistic paradigm not only in its fundamental philosophical assumption, as delineated above, but also in the focal points of research. It should be made clear that our emphasis on language disparities between Chinese and English does not mean that we deny the importance of language universals or the research undertaken to discover them. On the contrary, we deliberately adopt an inductive approach to arrive at language universals by exhausting language particulars in a systematic manner. More significantly, language universals to be uncovered, like languages particulars, should bear a direct and natural relationship to the human's basic and common cognitive abilities in space and time. It should also be made clear here that we do not wish to contend against Chomsky's innateness hypothesis. We simply view the hypothesis as an empirical question rather than an a priori philosophical assumption. If eventually we are faced with language universals which cannot be reasonably accounted for in terms of general cognitive capabilities, we may have to contemplate the possibility of treating them as innate. We believe this kind of inductive and empirical stance will avoid many current disputable points in Chomsky's innateness hypothesis.

The proposed non-objectivist view of Chinese grammar starts with a search for consistent patterns exhibited at the very surface of the Chinese language and therefrom to impute some conceptual principles capable of explaining the observed patterns in a natural and revealing manner. Consider the following example discussed in Hsieh (1978),

(1) 她嫁错了人。
    Tā jià-cuò-le rén.
    she marry-wrong-asp. person
    'She has married the wrong guy.'

(1) illustrates a systematic difference between Chinese and English in describing the making of mistakes. While Chinese has the pattern Subject Verb-wrong Object, English has the pattern Subject Verb Wrong-object. It is obvious that while the word cuò in Chinese is the second element of the resultative compound indicating the result of an action, the word wrong in English is an adjective modifying the object noun. If one takes an objectivist approach and assumes Chinese and English have the same conceptualization of making mistakes, one would perhaps feel comfortable in assuming that Chinese and English have the same deep structure for sentence (1), and their superficial difference results from the interaction of different principles or parameters the two languages have chosen. Although we have so far not seen any account of the grammatical difference in question by GB practitioners, given the rich mechanisms in GB theory, it may not be a very difficult task. On the other hand, if we take a non-objectivist approach, we can immediately see the difference in (1) as the grammatical embodiment of two different conceptual systems which are equally effective. As suggested by Hsieh, Chinese speakers attribute the mistake to the action which the subject performs; English speakers perhaps are merely reporting a discrepancy between the person she set out to marry and the person she has actually married. It is important to note here that Hsieh's explanation need not be taken within the context of the infamous Whorfian linguistic relativity hypothesis. It is not necessary for us to go beyond Hsieh's explanation by further proposing that the conceptual difference in question is attributable to different value systems possessed by Chinese and English cultures. In other words, we do not wish to correlate this conceptual difference with the popular misconception that in Chinese culture people tend to blame themselves for mistakes, while in English culture people tend to blame others. This particular example serves to illustrate an important demarcation between the present non-objectivist approach and the kind of linguistic relativism often attributed to Sapir and Whorf.

The contrast between objectivist and non-objectivist approaches in grammatical analysis can be further illustrated by the treatment of duration expressions in Chinese. Consider,

(2) *他念了书三个钟头。
    *Tā niàn-le shū sāngé zhōngtóu.
    he read-asp.book three hour
    'He read books for three hours.'

(3) 他念书念了三个钟头。
    Tā niànshù niàn-le sāngé zhōngtóu.
    he read book read-asp. three hour
    'He reads books for three hours.'
Sentences (2)-(4) show that Chinese and English are different in structuring duration expressions. While the pattern exhibited in (2) is grammatical in English, it is not acceptable in Chinese except under certain conditions. In contrast, the patterns in (3) and (4) are grammatical in Chinese, but odd in English. The phenomenon has recently intrigued a number of Chinese syntacticians working within the GB framework. In particular, Huang (1982, 1988) claims that sentences like (2) violate a general phrase structure condition (PSC) to the effect that in Chinese the head of VP can only branch to the left once, and only at the lowest level of expansion. Sentences (3) and (4) are therefore syntactically motivated to conform to the PSC. However, as has been recently shown by Tai (1988), verb-copying in sentences like (3) is independent of the PSC, and is both semantically and functionally motivated. We will not present Tai’s arguments here. Instead, we would like to point out that to derive (3) and (4) from (2) is to assume that Chinese and English have the same conceptual plan for construing duration expressions, and therefore to follow an objectivist approach. However, with a non-objectivist view, we can treat (3) and (4) as representing two natural ways of conceptualizing duration expressions in relation to the verb, rather than as some sort of ‘distorted’ structure resulting from well-formedness conditions in Chinese grammar. Thus, the verb-copying in (3) reflects an iconic representation for durative actions and states. The structuring of duration expressions as a nominal modifier represents another natural way of conceptualizing temporal expressions to measure the duration of an event. The naturalness of this kind of construing can be more clearly seen in sentences like (5).

(5) 他走了三天的路。
Tā zǒu-le sān tiān de lù
'He has travelled for three days.'

Note that the word lù ‘road’ need not be taken in the literal sense. It has the metaphorical meaning of ‘distance.’ Sāntiān de lù ‘three days’ distance’ has the same imagery as English expressions such as three-hours’ journey and ten-hour flight. Similarly, the word shū ‘book’ in (4) has the metaphorical meaning of ‘reading’ and sāngé zhòngtóu de shū does not mean ‘three hours’ book’ but rather ‘three hours’ reading.’ The fact that (6) and (7) are ungrammatical shows that our interpretation is on the right track.

(6) 他念了三个钟头的那本书。
*Tā niàn-le sān zhōngtóu de nà běn shū
He read-asp three hour de book
'He has read that book for three hours.'

(7) 他走了三天的那条路。
*Tā zǒu-le sān tiān de nà tiáo lù
he walk-asp three day de that road
'He has travelled on that road for three days.'

It should be obvious that the ungrammaticality of (6) and (7) is due to the fact that the referential function of ‘that book’ and ‘that road’ precludes the metaphorical senses of ‘book’ and ‘road’ in (4) and (5). It seems to be unlikely that the contrast between the grammaticality of (4) and (5) on the one hand, and the ungrammaticality of (6) and (7) on the other, can be accounted for by GB or other formal grammatical theories in a non-ad hoc manner.

The syntactic phenomenon in question supports Lakoff and Johnson’s (1980) theory that our conceptualization of the reality in many ways are metaphorically structured, and shows that the pattern in (4) and (5) are structured metaphorically. Moreover, it shows that grammar is not an arbitrary and autonomous formal system but embodies human conceptualization of the real world. It is important to note here that while current dominant grammatical theories including GB are interested in filtering the ungrammatical sentences such as (2), our aim is to find a natural explanation for the patterns illustrated in (3) and (4). Here again, the non-objectivist approach we have adopted allows us to find an effective way to uncover the Chinese patterns in question. Furthermore, it leads us to see the ungrammatical pattern in (2) in a refreshing different light. Consider the contrast between (2) and (8) in grammaticality:

(8) 我看了张三个钟头。
Wǒ kàn-le Zhāngsān sāngé zhōngtóu
I see-asp John three hour
'I saw John for three hours.'

In (8), the duration expression is construed in the same manner as in English. Thus, the pattern, though not unique in Chinese, is another natural way of construing duration expression. It can be viewed as a manifestation of a natural sequencing of verb, object, and complement in that the object is closer to the verb than the complement. It follows a fundamental iconic principle of word order as observed by Bybee (1985), which can be stated to
the effect that constituents with a closer semantic relationship tend to be
closer to each other in linear order. In light of the natural motivation for the
pattern exhibited in (8), the ungrammaticality in (2) can be viewed as
resulting from Chinese speakers' preference of (3) and (4) over (2) as duration
expressions in cases where the object is indefinite and hence susceptible to
metaphorization.

The non-autonomy of grammar and the role of metaphors in grammar
can be further illustrated by the difference between (9) and (10) with respect
to verb-copying.

(9) 他跳水跳了三个钟头。
    Tā tiào shuǐ tiào-le sān gè zhōngtóu.
    'He has dived for three hours.'

(10) *他跳河跳了三个钟头。
    *Tā tiào hé tiào-le sān gè zhōngtóu
    he jump river jump-asp three hour
    'He has jumped river for three hours.'

Syntactically, there is no reason why verb-copying should be disallowed in
(10). (10) is ruled out because tiào hé is a metaphorical expression for
committing suicide by jumping into the river, and therefore denotes an
instantaneous change-of-state and semantically is incompatible with
duration expressions. This can be further witnessed in

(11) *他跳了三个钟头的河。
    *Tā tiào-le sān gè zhōngtóu de hé
    he jump-asp three hour de river
    'He has jumped river for three hours.'

In contrast, tiào shuǐ in (9) is compatible with duration expressions and
therefore the verb tiào can be copied. For the same reason, (12) is
grammatical.

(12) 他跳了三个钟头的水。
    Tā tiào-le sān gè zhōngtóu de shuǐ
    he jump-asp three hour de water
    'He has dived for three hours.'

Finally, as elsewhere argued by Tai (1986), the conceptual basis for the
pattern exhibited in (4), (5), and (12) is parallel to the use of classifiers in
Chinese in that, whereas classifiers individuate objects (cf. Lyons 1977),
duration and frequency expressions in Chinese are temporal devices used to
individuate events. Thus, the non-objectivist approach again frees us from
the bondage of the English structure and enables us to see the genuine
conceptual basis shared by duration and frequency expressions and classifiers,
another unique characteristic of Chinese grammar. This is the kind of
generality that no GB rule will come close to construing.

The objectivist philosophy has misguided not only Chinese linguists who
have worked within the general framework of formal grammars, but also
those within the general framework of functional grammars. Consider
another insightful example from Hsieh (1978):

(13) 车子来了。
    Chēzi lái-le
    bus come-asp
    (a) 'The bus came;' (b) 'The bus has come;' (c) 'The bus is coming.'

Depending on the situation at hand, (13) can mean (a), (b) or (c) as indicated
in the English translation in (13). Since it is generally assumed by Chinese
grammarians that Chinese doesn't grammaticalize tense, only aspect, the (a)
and (b) readings do not pose serious problems for the analysis of -le in
Chinese. The (c) reading has, however, discouraged many Chinese
grammarians from searching a unitary core meaning for the aspect marker
-le. For example, Li and Thompson (1981), following the same objectivist
approach by Comrie (1976) toward a general theory of aspect, have to turn to
a rather abstract and complicated notion of 'bounded' rather than the simple
notion of 'completion.' However, if the notion of 'completion' in Chinese is
extended to the notion of 'having the situation under control,' as suggested
by Hsieh (1978), it is then only natural for Chinese to use -le to describe the
situations which are about to occur. In this respect, Japanese past tense -ka
has the same conceptual scheme as -le in Chinese and can be used to indicate
the imminence of a situation. It is important here to point out that 'having
the situation under control' is a mental state, independent of the actual
length of time in the real world. Thus, in Chinese, it is natural to use -le in
situations like

(14) 我今年就毕业了。
    Wǒ zhèn jǐn nián wū yuè jiù bié-yè-le
    I this year May soon graduate-asp
'I'll be graduating this May.'

(15) 他快五十岁了。
Tā kuài wǔshí suì-le
'He is approaching fifty.'

where the imminence of a situation can refer to an actual long stretch of time as in (15) for someone who is forty-six years old.

Another instructive example of misguidance by the objectivist approach in the research on Chinese grammar during the past quarter century can be found in the analysis of the well-known bà and bei constructions as illustrated by

(16)a. 我打了张三。
Wǒ dǎ-le Zhāngsān.
'I hit John.'

b. 我把张三打了。
Wǒ bā Zhāngsān dǎ-le.
'I hit John.'

c. 张三被我打了。
Zhāngsān bèi wǒ dǎ-le.
'John was hit by me.'

With some rare exceptions, Chinese linguists working within the general framework of formal syntax have related (16b) to (16a) either by moving the object to preverbal position with the insertion of bà as some kind of preposition or by embedding the plain SVO sentence under the causative bà as a higher predicate. The bei sentence in (16c) is simply taken to be equivalent to the English passive, with the SVO sentence in (16a) as its corresponding active. Underlying this kind of analysis is the objectivist view which assumes that Chinese has the same grammatical notion of the active-passive correspondence as English. Yet, the fact that the bà and bei constructions share many common semantic and syntactic properties and that both have a meaning of causation reveal that Chinese speakers use a different conceptualization scheme. It is clear that the bà and bei constructions are both causatives from two different viewpoints but on the same plane in clear contrast with the non-causative SVO construction on a different plane. Thus, if we insist upon the existence of an active-passive relation in Chinese, the bà construction should be treated as the active and the bei construction as the corresponding passive. The SVO sentence is then neutral, being neither active nor passive. Furthermore, the existence of the bà and bei constructions as causatives should not be regarded as an isolated phenomenon in Chinese grammar. It is related to other negative constructions and some important principles of Chinese verb semantics as discussed in Tai (1984). There is some evidence that the notion of agency is not inherent to the meaning of transitive action verbs in Chinese as it is in English. For example, in Chinese, the affected object can serve as the subject of a transitive verb without a passive marker or passive meaning as can be seen in

(17) 信写了。
Xìn xiě-le.
'Letter write-asp.
'The letter is written.'

(18) 衣服洗了。
Yīfú xǐ-le.
'Clothes wash-asp.
'The clothes are washed.'

As suggested by Tai (1984), while English looks at the ending point of an accomplishment or achievement verb from the viewpoint of agent, Chinese does it from the viewpoint of the affected patient. In other words, given the same situation, English is more interested in finding out who does what, while Chinese is more concerned with what has happened. This Chinese conceptualization principle is clearly manifested in the obligatory grammaticalization of the result of an event in verb compounds and in word order. In light of this conceptual scheme, the causative construction can be viewed as an overt mechanism for Chinese to give the meaning of agency. This view is further supported by an interesting observation by Hsueh (1986) that there exists a consistent correspondence relationship between sentences like (17) and (18) and the corresponding ones with bà in (19) and (20).

(19) 他把信写了。
Tā bà xìn xiě-le
'He wrote the letter.'

(20) 他把衣服洗了。
Tā bà yīfú xǐ-le
'He washed the clothes.'
The non-objectivist approach thus leads us to detect a covert conceptual system underlying several areas of Chinese grammar that are of central importance. We will discuss in greater detail later the operation of this conceptual system in Chinese grammar. At present, it suffices to reiterate our main point, namely, that only when we abandon the objectivist philosophy will we be able to discern the internal coherence of the conceptual system underlying a language.

Space and time constitute two of the most important cognitive domains for the conceptualization of situations and happenings in human languages. We will therefore start by investigating grammatical constructions expressing existence and location in space and time. It is a fact that all human beings have the same biological make-up and live in the same universe. It is also a fact that children develop certain perceptual strategies about spatial and temporal relations while or even before they learn to talk about them. Given these facts, it can be expected that there are certain universal constraints on the symbolization of spatial and temporal expressions across different languages. Thus, it would not be surprising that we should find many similarities between English and Chinese with regard to spatial and temporal expressions. Some of the similarities should become clear during the course of discussion. However, for our present purposes, we will focus on the systematic differences between the two languages with respect to the symbolization of reality in space and time in line with the non-objectivist approach elucidated above.

2. Spatial Expressions

It has been observed by psychologists (cf. H. Clark 1973; Miller and Johnson-Laird 1976) that anthropocentrism and anthropomorphism play an important part in human perception of space and time and in language. Both perception and language are determined by biological make-up. Because of biological make-up, humans perceive objects, people, space and time, and their interrelation in a particular and coherent way. The physical world in which we live and the biological structure of our bodies place a certain number of a priori constraints on our perceptions and language. It is clear that children know about different relations in space before they start to talk about them. For instance, children do not use their first spatial prepositions in English until age two or two-and-a-half. However, as documented by Clark & Clark (1977), well before this, they show that they know some objects are containers (e.g. cups, boxes), others are supporting surfaces (e.g. tables, beds), and many have a normal or usual orientation (e.g. a bottle normally stands upright). E. Clark (1973,1974) has observed the following three basic rules formed by children of spatial relations pertaining to the concepts of containing, supporting, and touching:

Rule 1: If B is a container, A belongs inside it.
Rule 2: If B has a supporting surface, A belongs on it.
Rule 3: If A and B are related to each other in space, they should be touching.

The fact that children had these three rules as a priori knowledge of spatial relations need not be construed as innate. Following Johnson’s (1987) insights, we can reasonably regard these rules as derived from human bodily experience since the very beginning of childhood. As insightfully observed by Johnson, we constantly experience our bodies both as containers, and as things in containers. Similarly, the part-whole relation implied in these three rules can be derived from our bodily experiences since childhood; we are ‘whole-things’ with parts that we can manipulate.

Since all human beings have the same biological make-up, we have every reason to believe that a Chinese child is born with the same cognitive capacities as an English child. It is therefore safe to assume, pending further experimental evidence to the contrary, that a Chinese child has the same a priori knowledge of spatial relations as reported by Clark before he/she learns to express spatial relations in Chinese. With this assumption, we can see that spatial prepositions in English, such as at, on, in, above, below, between, etc., are more abstract than their equivalents in Chinese. English prepositions at, on and in are abstract symbols standing for one, two, and three-dimensional spatial relations, respectively. Chinese uses the word 在 ‘to exist or to be located' to indicate the existence of an object, and the whole-part schema to talk about spatial relations. For example,

(21) 那本书在桌子的上头。
    Nà běn shū zài zhúzǐ de shàng tóu.
    that book exist table 's top
    'The book is on the table.'

Notice that zhúzǐ de shàngtōu expresses the whole-part relationship just like wò de shǒu ‘my hand’ in Chinese. As a matter of fact, the container scheme operates even more consistently in the 你 construction as in
In (22), with *yǒu* meaning 'to have or to possess,' the whole-part relation holds first between the table and the top, and then between the top of the table as a whole and a book as a contained part.

A digression may be in order here regarding the meaning of *zài*. We have interpreted the word *zài* as 'to exist' instead of 'to be located' as commonly translated. Aside from the etymological evidence [i.e., *zǎi cún yě* (在存也) 'zǎi is to exist' as documented in the *Shuo Wen Jie Zi* (说文解字)], the synchronic evidence for this interpretation can be seen in expressions such as *cùnzǎi* (存在) 'to exist, existence,' *zhéi wèntí hǎi zǎi* (这个问题还在) 'the problem is still there,' *wǒ zǔfū yǐjīng bù zài* (我祖父已经不在了) 'My grandfather has passed away.' The close semantic and syntactic relationship between the verb 'to have' and locative phrases across different languages has been a well-known linguistic fact. Yet, it is only in light of the inseparable link between human spatial perceptions and their symbolization in language that the interplay between *yǒu* and *zài* in Chinese grammar begins to make sense to us.

The language acquisition theory offered by Chomsky in conjunction with the innateness hypothesis can hardly provide any explanation for the relatedness among 'to have,' 'to be,' and locative expressions in natural languages (cf. Lyons 1977).

Returning to the conceptualization of whole and part, Chinese has a general linearization principle in which the whole is ordered before the part. This principle is most vividly illustrated in the order addresses are given.

(23) 台湾，台北，罗斯福路三段，九十九号。
Taiwán, Táiběi, Luósfúlù Sānduàn, Jiǔjiǔhào
'Taiwan, Taipei, Roosevelt Road, Section 3, No. 99.'

The linearization principle in English, on the other hand, is to place the part before the whole, as in the top of the table and in giving addresses. Contrast (24) with (23) above.

(24) 2334, North High Street, Columbus, Ohio, U.S.A.

These two examples above reveal a fundamental difference between Chinese and English in conceptualization of the whole-part relation, which is manifested in different word orders in the two languages. Before we discuss the nature of this conceptual difference, it is necessary for us to examine in more detail how the principle of whole-before-part works in Chinese grammar. Consider the following examples:

(25) a. 我剥了橘子的皮。
Wǒ bó-le júzi de pí.
'I peeled the orange.'

b. 我把橘子剥了皮。
Wǒ bā júzi pó-le pí.
'I peeled the orange.'

c. 橘子被我剥了皮。
Júzi bèi wǒ pó-le pí.
'The orange was peeled by me.'

(26) a. 五个橘子我吃了三个。
Wǔ gè júzi wǒ chi-le sān.ge
'I ate three of the five oranges.'

b. 我把五个橘子吃了三个。
Wǒ bā wǔ júzi chí-le sān.ge
'I ate three of the five oranges.'

c. 五个橘子被我吃了三个。
Wǔ gè júzi bèi wǒ chí-le sān.ge
'Three of the five oranges were eaten by me.'

(25) and (26) would result in ungrammatical sentences if the word order whole-before-part is reversed. Huang (1982) uses the phrase structure condition (PSC) he proposes for Chinese to justify the movement of the whole to the preverbal position. However, it is clear that since PSC is a formal constraint against having two complements at the lowest level of the expansion within VP, it clearly says nothing about moving the whole rather than moving the part. Since 'part' and 'whole' cannot be easily translated into formal notions in GB, there seems to be no principled way to state this constraint in Huang's treatment. (25) and (26) also show that *bā* and *běi* constructions are not merely formal mechanisms without conceptual basis. In (25) and (26), the whole-part relation holds not only in the real world but also in our conceptual world. It is the whole-part relation that enables us to talk about a part being away from the whole, either as an object (25) or as an aggregate of objects (26). We have earlier mentioned *bā* and *běi* constructions as causatives. (25) and (26) thus symbolize the causation as well as the result of the causation.
In (25) and (26), we describe taking a part away from the whole. In contrast, when we are talking about putting two things together, we can adopt both word orders.

(27) a. 我把汤加了盐。
   Wǒ bā tāng jiā-leşán.
   I soup add-asp salt
   'I put the salt in the soup.'
   b. 我把盐加在汤里头。
   Wǒ bā yán jiā zài tāng lìtou.
   I salt add at soup inside

The allowance in (27) for both orders reflects two logical possibilities when we put two things together, that is, either we move X to Y, or we move Y to X. Furthermore, both logical possibilities are allowed, since the whole-part relation is not fixed until the causation has happened.

A note is perhaps appropriate at this point that we use the bā and bei constructions here to illustrate the word order constraint imposed by the whole-part relation in order to emphasize the need to construct a conceptual basis for Chinese grammar in terms of our spatial cognition. Many intriguing questions have been raised in the Chinese linguistics literature as to the nature of bā and bei constructions. In a formalist approach, based in part on these two constructions, Tai (1973) has proposed a controversial theory claiming that Chinese has SOV as the underlying word order. Li and Thompson (1974) argued that Chinese has changed from SVO to SOV. More recently, partly to account for some ungrammatical sentences involving these two constructions, Huang (1982) proposes Chinese is basically a left-branching language. We strongly feel that formal explanations for the two constructions have failed to touch the heart of the matter, no matter how rigorously and elegantly presented. Alternative proposals have been made. Within the framework of functionalism, Wang Li (1947) has proposed a disposal meaning, and Hsueh (1986,1989) has proposed a topic theory, for these two constructions. While we believe that semantically based functional approaches to the two constructions are on the right track, we also believe that the linguistic semantics employed for various functional explanations for the two constructions must be re-examined in light of the symbolization of causatives in space and time in Chinese culture that we are calling attention to here.

We have earlier noted that while Chinese tends to place the whole before the part, English tends to do the reverse. The question arises as to what we can reason from this difference about human perception. We wish to tentatively suggest that, with regard to the containment relation or the whole-part relation, we as humans place no preference on the ordering of the whole and part vis-a-vis each other. If our suggestion should prove to be right, it has non-trivial ramifications for our understanding inherent cognitive properties. In other areas of perception involving the structure of the human body, such as up versus down, front versus back, for instance, humans prefer up to down and front to back because of human canonical upright body position, and because our eyes are on our faces and not on the backs of our heads. We walk forwards instead of backwards. These universal perceptual constraints manifest in all human languages. For example, in English and Chinese, and presumably most other languages, while up and front symbolize positive value, down and back symbolize negative value. Furthermore, dimension expressions such as how far, how tall, how big, etc. are oriented with up and front, and not with down and back. It has long been observed by psychologists that the vertical up-down dimension is more salient than the asymmetrical front-back dimension, which is in turn more salient than the symmetrical left-right dimension. Since the whole-part relation allows both word orders in natural languages, it may have the property of a symmetrical spatial relation too. In the following section, we will see that the verticality dimension and the asymmetrical front-back dimension play an important role in Chinese temporal expressions.

3. Temporal Expressions

When children start to talk about events in sequence, they stick closely to the actual order of occurrence of events in the real world, that is, they describe the first event first, and the second event second, and so on. For instance, in production, children say (30) to describe the two-event sequence the boy jumped the fence and then he kicked the rock (Clark & Clark 1977: 506-508).

(30) Boy jumps fence, boy kicks rock.

Children also find it easier to comprehend and to imitate adult descriptions where the order in which events are mentioned mirrors the order in which events occur. Thus, for example, for three-and-four year old, the sequences in (31) are easier to imitate than the ones in (32) (Clark & Clark 1977: 506-508).

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(31)  a. The boy came in before the girl did.
    b. After the dog bit him, the man ran away.

(32)  a. The girl came in after the boy did.
    b. Before the man ran away, the dog bit him.

In a recent work on word order in Chinese, Tai (1985) proposed the principle of temporal sequence (PTS): the relative word order between two syntactic units is determined by the temporal order of the states or events which they represent in the conceptual world. Tai shows that this principle captures the most general tendency of word order in Chinese. This principle covers, for example, the natural serialization involving two temporally-conjoined clauses and phrases in Chinese. For instance,

(33)  a. I have eaten dinner, you (then) called me.
    Wǒ chī-guō fàn, nǐ (zài) dǎ diànhuà gěi wǒ.
    'I ate-asl meal, you (then) make telephone to I'
    'Call me after I have finished the dinner.'
    b. *You (then) called me, I have eaten dinner.
    *nǐ (zài) dǎ diànhuà gěi wǒ, wǒ chī-guō fàn.

(34)  a. John rode bicycle away.
    Zhângsān qì xíngqīng chī-le
    John ride bike leave-asp
    'John left riding his bike.'
    b. *John rode bicycle away.
    *Zhângsān zōu-qi xíngqīngché.

(35)  a. He is taller than I.
    Tā bǐ wǒ gāo.
    'He is taller than I.'
    b. He is taller than I.
    *tā gāo bǐ wǒ.

(36)  a. He said to me.
    Tā dui wǒ shuō.
    'He said to me.'
    b. *He said to me.
    *tā shuō dui wǒ.

Furthermore, Tai (1985) shows that the PTS also gives a natural account for numerous cases of meaning contrast induced by different word orders in Chinese. A few examples should be useful here. Contrast (41) with (42), and (43) with (44).

(41)  a. He came here by bus.
    Tā zuò gōnggōng-qīché dào zhèr.
    'He came here by bus.'
    b. *He came here by bus.
    *tā zuò gōnggōng-qīché dào zhèr.

(42)  a. He came here to ride in a bus.
    Tā dào zhèr zuò gōnggōng-qīché.
    'He came here to ride in a bus.'
(43) 他在马背上跳。
Tā zài mǎ bèi shàng tiào.
He at horseback jump
'He is jumping on the horse’s back.'

(44) 他跳在马背上。
Tā tiào zài mǎ bèi shàng.
'He jumped onto the horse’s back.'

There is no need to repeat Tai’s discussion of the explanatory value of PTS for the above set of data in Chinese. What is worth pointing out here is that PTS provides a natural semantic explanation for the systematic functional difference between the preverbal and the postverbal zài phrase as illustrated in (38), (39), (43) and (44). As we have pointed out earlier, the focus on the result part of an event is one of the central principles underlying Chinese grammar in word order and in lexical semantics as well.

It should be noted here that, with the exception of (39b), the (b) sentences in (35) through (40) can be acceptable with different functions of focus including that of after-thought. It has often been observed in Chinese grammar that the focused element in Chinese tends to be placed at the end of the sentence. In fact, following Osgood (1980), Tai (1985) has called attention to an important distinction between natural word order and salient word order. While the natural word order is perception based, the salient order carries with it the speaker’s interests, involvement, focus, etc. PTS is a principle of natural word order in that it is based on our perception of events and states in temporal sequence. The interplay between PTS and the Saliency Principle (SP) in Chinese word order remains to be investigated. For the present purpose, it suffices for us to use a few examples to illustrate a possible way in which the two principles interact. Consider, for example,

(45) 我病了，没去开会。
Wǒ bìng le, méi qù kāi huì.
'I was sick, and (therefore) didn’t attend the meeting.'

(46) 我没去开会，因为我病了。
Wǒ méi qù kāi huì, yǐnwéi wǒ bìng le.
'I didn’t attend the meeting, because I was sick.'

(45) employs the natural order of presenting the reason before the consequence, and (46), the salient order of placing the consequence before reason. Similarly,

(47) 他天天念书，以便考上大学。
Tā tiān tiān niàn shū, yìbiàn kāoshāng dàxué.
He day-day study book, in order to pass-exam college.
'He studies every day in order to pass the college entrance exam.'

(48) 为了考上大学，他天天念书。
wèi le kāoshāng dàxué, tā tiān tiān niàn shū.
for
'In order to pass the college entrance exam, he studies every day.'

(47) uses the natural order of action before the goal, in accordance with PTS, and (48) places the goal in front of the beginning of the sentence, following SP.

An integrated theory of word order in Chinese in terms of functional and cognitive principles requires principles in addition to PTS and SP. We will introduce them as we proceed in our discussion. At this point, we would like to introduce a principle of ‘information center’ in Chinese (hereafter to be referred to as PIC), which can account for the fact that syntactic mappings in Chinese operate in terms of the center of information and not necessarily in accordance with the syntactic head as in English and other European languages. PIC is independently motivated for the distribution of the negative bu and A-not-A questions in Chinese. For example,

(49) a. 他跑得不快。
Tā pāo de bu kuài.
he run de not fast
'He doesn’t run fast.'

b. *他不跑得快来。
*Tā bù pāo dé kuài.

(50) a. 他跑得快来。
Tā pāo de kuài bu kuài.
he run de fast not fast
'Does he run fast?'
The difference between SP and PIC is an important one and needs to be clarified. While SP is defined on the notion of focus, PIC is defined on the notion of information center. Focus involves the packaging (la Chafe 1976) of information based on the attitude of the speaker, while 'information center' is pragmatically structured and is independent of a speaker's attitude. Thus, in both Chinese and English, the information center of 'He runs fast.' falls on 'fast,' and not the verb 'run.' This is because the statement 'He runs fast.' presupposed 'He runs,' and 'fast' is the asserted part of the statement. When we ask the question 'Does he run fast?' we are not questioning whether he runs or not, but rather whether his running is fast or not. The difference between Chinese and English in this respect lies not in semantics but in syntax, in that Chinese syntax refers to the 'information center' rather than 'the verb.' Huang (1988) argues that the head of (51) is not kuai but pao. Since Huang has given strong argument within the GB framework for pao as the head of the VP in (51), we can assume pao is the verb in (51) in so far as one has to work with the assumption that Chinese has a clear notion of lexical category of 'verb' as in English. It seems that some principles of Chinese grammar have to refer to the 'head,' while others have to refer to the 'information center.' Thus, in addition to the distribution of the negative bu and the A-not-A question, word order in Chinese is also governed by PIC. As far as the word order is concerned, PIC can be stated as

**PIC:** The asserted part of a sentence is ordered after the presupposed part.

By PIC, the 'information center' is the asserted part and is ordered after the presupposed part. PIC is also compatible with the topic-comment structure in Chinese (cf. Li and Thompson 1976) in that both topic and what is presupposed represent 'given' information, and comment and the asserted, 'new' information. Thus, it is possible to collapse PIC and the topic before the comment principle into one single principle familiar in linguistic literature, that is,

**PIC:** The given is ordered before the new.

It is interesting to see that the principle of given before new is consistent with the PTS. While PTS is determined by the temporal sequence in the objective world, the given-new principle is determined by the temporal sequence in the subjective-mental-temporal axis. It is therefore not surprising that Chinese is a topic-comment language and obeys PTS more consistently than many other languages.

The distinction between the objective and the subjective conceptualization of temporal sequence has many important ramifications for our understanding of Chinese grammar. Although we cannot at this point elaborate on this distinction, we would like to give a general idea of how the subjective temporal sequence works in the present framework. Consider,

(52) My president, my dean, and my chairman talked to me.

There are three possible interpretations of this sentence: (1) three events took place in the order as indicated by the coordinated subjects; (2) only one event took place but the order reflects my ranking of the three subjects in importance, and (3) only one event took place without the ranking. (1) represents the temporal sequence in the real world, (2) in the subjective mind of the speaker, and (3) a lack of temporal sequence in both real world and the subjective mind. Furthermore, PIC can be extended to cover another important fact of word order in Chinese, namely, a relative clause precedes its head noun, if the notion of pragmatic presupposition that we have employed in PIC can be extended to the kind of presupposition which the relative clause represents in relation to the main clause. If so, then PIC, or perhaps even the given-new principle, can serve as a functional principle which determines the consistent order of the modifier before the modified, and which allows for the existence of of the so-called pseudo-relative clauses as in

(53) The sound of his opening door is very loud.

'The sound of his opening door is very loud.'
To ba mai shu de qian dou hua kuangle.
'He has squandered all his money which was for him to buy books.'

For the sake of completion, we need to mention that the PTS determines the asymmetrical word order between two units X and Y. Hence, a lack of temporal relation will allow both X-Y and Y-X order and thus a symmetrical word order. The most conspicuous examples can be found in coordinate structures.

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Similarly, the lack of temporal sequence would allow coordinate noun phrases to have free word order.

4. Spatially Based Temporal Expressions

Now I would like to turn to the second part of our exploration of time expressions in Chinese. We will be guided by the localist hypothesis (cf. Clark 1973, Lyons 1977) which assumes that time is a spatial metaphor. This hypothesis is based on the observation, known to linguists for a long time, that spatial and temporal expressions in English as well as other languages coincide considerably. The hypothesis assumes that spatial expressions are more basic, grammatically and semantically, than non-spatial expressions of

various kinds including time expressions. In the previous section, we have dealt with the PTS, which is independent of the spatial metaphor. In this section we will focus on time expressions, which are based on the metaphorization of spatial expressions.

In discussing spatial expressions in Chinese, we have noted that the word zai indicates the location or existence of an object in space. In temporal expressions, it indicates an action in progress. For example,

(60) 我在看书。
Wǒ zài kànshū.
'I am reading books.'

(60) can be construed as 'I am located in the time period of reading.' On this point, Chinese is similar to many pidgin and creole languages. Similarly, the aspect marker zhe have originated from the notion of 'be attached to some location.'

(61) 我看着书呢。
Wǒ kàn-zhē shū ne.
'I am reading the books.'

The differences between zai and zhe as aspect markers within the framework of temporal structure have been adeptly analyzed by Chan (1980). It is obvious from her analysis that while zai locates a process on the time axis, zhe locates a state on time axis. Tai (1987) proposed a localist theory of aspect markers in Chinese and showed that the temporal structures of the aspect markers in Chinese can be explained in terms of their spatial structures on the time axis.

We have observed earlier that Chinese spatial expressions follow the principle of placing the whole before the part in word order. Not surprisingly, temporal expressions in Chinese obey the same principle. For example,

(62) 现在是一九八七年二月二十六号, 下午四点三十分。
Xiànzài shì yī-jiǔ-bā-qí nián ěryué ěrshíliùshí, now be 1 9 8 7 year Feb. twenty-six no. xiàwǔ sì diǎn sān shí fēn afternoon four hour thirty minute
'It is now 4:30 p.m., February 26, 1987.'
This striking similarity in word order between temporal and spatial expressions has prompted Tai (1985) to propose the principle of temporal scope (PTSC):

If the conceptual state represented by a syntactic unit X falls within the temporal scope of the conceptual state represented by a syntactic unit Y, then the word order is YX.

PTSC accounts for examples such as

(63) a. 他昨天来了。
   Tā zuótiān lái-le.  
   'He came yesterday.'

b. *他来了昨天。
   *tā lài-le zuótiān.

(64) a. 他来的时候，我在看书。
   Tā lái de shíhòu, wǒ zài kàn shū.  
   'When he came, I was reading books.'

b. *我在看书，他来的时候。
   *wǒ zài kànshū, tā lái de shíhòu.

Zuótiān 'yesterday' in (63) and tā lái de shíhòu 'when he came.' in (64) delimit temporal scopes within which events occur. In (63), since the event is represented by the verb 'to come,' 'yesterday' is ordered before the verb by PTSC. In (64), the event is represented by the main clause, and so the subordinate clause 'when he came' is ordered before it by PTSC.

Temporal scope is not the only way in which the more concrete notion of spatial scope can be extended. Other extensions are possible. Thus, in Chinese, there exists a consistent correspondence between the scope interpretation and word order as exemplified in the meaning contrast between (65) and (66), and between (67) and (68).

(65) 他不常来。
     Tā bù cháng lái.  
     'He doesn't come often.'

(66) 他常不来。
     Tā cháng bù lái.  
     'He often doesn't come.'

(67) 他们都不来。
     Tāmén dōu bù lái.  
     'None of them will come.'

(68) 他们不都来。
     Tāmén bù dōu lái.  
     'Not all of them are coming.'

In general, however, our Chinese data strongly support the hypothesis that the notion of scope has a conceptual basis in our basic spatial knowledge. In other words, our concepts of abstract scope and other logical inclusions pattern after our perception of spatial inclusion based on the whole-part relation.

H. Clark (1973) has made several observations regarding time as a spatial metaphor. First, because time is one-dimensional, it ought to be described by one-dimensional spatial terms. Thus, in English as well as in Chinese, we say time is very long, and not time is very wide; nor is time very tall. The concept of wide involves two dimensions, and tall, three dimensions.

(70) 时间很长。
    Shíjiān hěn cháng.  
    'Time is very long.'

(71) *时间很宽。
     *Shíjiān hěn kuān.  
     'Time is very wide.'

(72) *时间很高。
     *Shíjiān hěn gāo.  
     'Time is very tall.'

In Chinese, one can say
English uses both metaphors too. In the case of moving time metaphor, English has to use ‘before’ and ‘after’ instead of ‘front’ and ‘back’ as in Chinese. It seems that Chinese speakers prefer the moving time metaphor, whereas English speakers prefers the moving ego metaphor. To many native speakers of English, the expression qiantian (前天) ‘front day’ means ‘the day ahead’ and conversely the expression ‘back day’ means ‘the day behind.’ Perhaps the existence of before and after expressions are needed in English to counter the preference to the moving ego metaphor. In other words, we are suggesting that English speakers shift the moving ego metaphor to the moving time metaphor when they use ‘before’ and ‘after’ expressions. In contrast, since Chinese prefers the moving time metaphor, there is no need for this kind of adjustment.

In contrast to English, Chinese systematically uses vertical spatial relation above-below to describe the past and the future. For example, shangge yue (上个月) ‘above month’ refers to ‘last month,’ shangge xingqi (上个星期) ‘above week’ to ‘last week,’ and shang ci (上次) ‘above time’ to ‘last time,’ xiage yue (below month) refers to ‘next month,’ xiage xingqi (下个星期) ‘below week’ to ‘next week,’ and xi ci (下次) ‘below time’ to ‘next time.’ As often encountered in Chinese classrooms in this country, American students in first year Chinese often find the system counter-intuitive. To them, above is related to moving up, therefore future, and by contrast, below is related to the past. Here, we have another indication that English speakers prefer the moving ego metaphor. The contrast between Chinese and English with regard to the preference of one over the other metaphor may or may not bear a relation to an often-noted observation that Chinese thinking pattern tends to be static, while Western thinking pattern tends to be dynamic. Again, it needs to be made clear that within the framework of the non-objectivist approach the main concern is the existence of possible alternative perceptual strategies to the same objective reality, and not the correlation between the choice of alternative strategies and a particular cultural tradition. Herein lies the fundamental difference between the classical Sapir-Whorfian hypothesis and the present non-objectivist approach.

Let us use the above-below spatial metaphor to illustrate a culturally-based approach and the present non-objectivist approach. As a first approximation, we might be tempted to relate the metaphor in question to the fact that in the Chinese cultural tradition, seniors are perceived as above, with more authority, and juniors as below, with less authority. This is indicated in expressions such as shang yi dai (上一代) ‘above one generation’ or ‘last generation’ versus xia yi dai (下 一代) ‘below one generation’ or ‘next generation’ and shang yi ji (上一级) ‘above one step’ or ‘immediate superiors’
versus 下一级 (下一级) 'below one step' or 'immediate subordinates.' Or alternatively, we might be tempted to correlate this metaphor with the tradition of writing from top to bottom in Chinese. Within the general constraints of the non-objectivist approach, we have to reject both culturally-based explanations. In fact, we have searched for a spatial experience for the above-below temporal expressions. We suggest that our experience with objects falling from the sky to the ground (because of the law of gravity) provides a reasonable perceptual basis for this particular above-below metaphor for temporal expressions in Chinese and possibly in other languages.11

5. Conclusion

In this essay we have proposed a philosophy, a method, and a new line of research for constructing Chinese grammar. By adopting a non-objectivist approach, we have made an attempt to see the structure of the Chinese language without any undue interference from those formal grammatical theories which are rooted in the morpho-syntactic features of Indo-European languages. Specifically, we turned to a cognitive-functional framework which is based on some basic perceptual strategies and communication principles independent of morpho-syntactic features in any particular language. In this way, we become free from the confinement of deeply rooted Western grammatical concepts, and transcend superficial issues such as whether Chinese has 'parts of speech,' whether Chinese covers prepositions, whether Chinese is an SOV language, whether Chinese is head-final, and many other issues arising within the framework of formal structural linguistics--traditional or contemporary. We view Chinese grammar as a communication system adopted by Chinese speakers based on a set of conventional symbolic imageries. Furthermore, we view grammar in general as symbolic of the reality we experience and perceive within the constraints of our body structures and motion. Because of the central importance of space and time in our cognitive system, we start with them in our construction of a cognitively-based functional grammar of Chinese. This paper represents only a preliminary attempt in this direction. Nevertheless, we are confident that the direction we take is generally on the right track, and that many more hidden structural principles in terms of spatial and temporal perceptions can be gradually uncovered as research progresses.

The proposed non-objective approach not only will enable us to uncover many true generalizations in Chinese grammar but it may also provide us with a rational and empirical method for the search of language universals in terms

of basic human perceptual strategies regarding space and time. Language universals are then natural outcomes of the interaction of human perceptual mechanisms and the physical world. Thus, the whole-part relation is part of our perceptual system and is also a language universal principle. The notion of temporal sequence is part of our conceptualization of the physical world and therefore is also a language universal. The fact that English grammar exhibits only some traces of this principle does not rule out the universality of this principle. It is quite possible that some other grammatical principles specific to English, due to its inflectional morphology, may have overridden the temporal sequence principle. Other language differences may be due to the choice of the allowed options as we have discussed in the case of linearizing the part and the whole in the case of the choice of available universal time metaphors. Some language universals, such as the saliency principle which we have discussed in conjunction with the temporal sequence principle, can be viewed as universal strategies of communication. Again, they can be overridden by language-particular mechanisms such as emphatic markers.

We have observed that Chinese exhibits grammatical structures similar to child language. It has also been recently observed that Chinese shares with creoles and pidgins a great deal of grammatical features. Perhaps a direct way to discover language universals is to investigate non-inflectional languages like Chinese together with child language, creoles and pidgins, as suggested by Bickerton (1981) and Haiman (1985). For this purpose, one can use the proposed cognition-based functional grammar as a general framework.

A final note is needed regarding the nature of phrase structures. Since the proposed grammatical theory does not assume a set of phrase structures to begin with, many questions regarding the origin of hierarchical structures in grammar, in addition to word order, need to be addressed in the future. At this point, we do not have a concrete program to account for hierarchical structures. To what extent hierarchical structures are motivated by abstract mathematical principles and to what extent are they motivated by perceptual strategies remain an open question. For example, recently Langacker (1987), working within the framework of cognitive grammar, has shown that parts of speech such as nouns and verbs can be semantically defined by certain cognitive principles. Also, an earlier attempt by Hopper and Thompson (1984) has shown that universal lexical categories such as nouns and verbs can be derived from their discourse functions in human communication. Therefore, in principle, we will be able to construct a grammar, any grammar, by relying
essentially on principles that are conceptually motivated rather than logico-mathematically structured.\textsuperscript{12}

\section*{NOTES}

*This paper is based on a lecture entitled “A Non-Objectivist View of Chinese Grammar: Time and Space,” given at a colloquium sponsored by the Department of East Asian Languages and Literatures at the Ohio State University in February 1987. I have benefited from comments from the students and faculty who attended the colloquium, especially from Dana Bourgerie, Frank Hsueh, Brian King, Shigeru Miyagawa, Leon Serafim, and Galal Walker. My sincere thanks are due to Biq Yung-O, Nikki Bado and Wang Lianqing who have read the final draft and identified a number of typos and omissions to be corrected before the final printing. I am most grateful to Marjorie Chan, Hsin-I Hsieh, and Gerald Sanders who have read an earlier version of this paper and made many valuable suggestions which have been incorporated into this revised version. It goes without saying that I am solely responsible for all possible errors.

1. Chomsky is often considered a transformationalist and mentalist against Bloomfield, a structuralist and behaviorist (see Newmeyer 1980). From our point of view of functionalism, Chomsky belongs to the mainstream of structuralism in that he believes that linguistic structures are independent of communication functions.

2. Hsieh (1978: 168) gives his explanation for this attitude of linguists:

However, linguists, encouraged by the initial success of the 19th century neo-grammarians, are in uncovering the regularity of change in phonological forms, have laid a seemingly disproportionate emphasis on syntax and phonology which are studies on linguistic forms, to the neglect of semantics, which concerns meaning and the reality behind meaning. For over a century, since the day of the neo-grammarians, most linguists have insisted on studying language as what amounts to a mathematical system of formal operations rather than as a psychological system of human communication. The point of this trend coincided with the appearance of Chomsky's transformational generative grammar, a framework that purports to study language through syntax, viewed as in essence independent of semantics and the real world.

3. As observed by Li and Thompson (1982:445), when the object is a personal pronoun or a definite animate noun phrase, the pattern of verb-object-duration phrase is acceptable. For example,

\begin{align*}
(101) \quad \text{他看了我三个钟头。} \\
\text{Tā kān-le wǒ sān gè zhōngtou.} \\
\text{He watched me for three hours.}
\end{align*}

\begin{align*}
(102) \quad \text{他等了张小姐三个钟头。} \\
\text{Tā děng-le Zhāng xiǎojī sān gè zhōngtou.} \\
\text{He waited for Miss Zhang for three hours.}
\end{align*}

The acceptability conditions for the pattern in question are much more complicated than hitherto understood. See Tai (1988) for some of these conditions and a motivation-based explanation for the intricate phenomenon of verb-copying in Chinese.

4. By 'natural,' we mean that a conceptualization embodied in a grammatical pattern is based on iconic motivations, metaphorical extensions, principles of economy, or principles of communication. Admittedly, the basis of regarding something as natural and something as not cannot always be clearly defined. However, as the search for motivations for grammatical patterns continues, we will have better ways of answering the question as to what constitutes natural ways of symbolization in grammar. For example, many hidden imageries underlying Chinese grammar are for the first time uncovered by Hsieh (1989, in this volume).

5. Both (10) and (11) can become acceptable, if followed by another clause such as kēshí hái méi tiào jīngū, yīnwèi tā pá de (可是还没跳进去，因为怕死) but he hasn’t jumped into (the river) yet, because he is afraid of death.' This fact further supports our contention that the verb reduplication involving duration expressions in Chinese is semantically motivated and cannot be neatly characterized in terms of syntactic conditions or simple semantic features specified for verbs.

6. This point is further elaborated by Hsieh (1989, in this volume).

From such a perspective, we can see clearly that English and Chinese operate with two strikingly different systems for expressing spatial
relations. English employs a one-step method which requires the use of prepositions such as at, on and in which seem to be of a homogeneous kind but which actually stand for one-, two-, and three-dimensional spatial relations, respectively. By contrast, Chinese operates with a two-step schema. First, Chinese uses the word zai ‘to be located at/on/in’ to indicate the general nature of the relation, namely, that it is a spatial relation. As a second step, Chinese elaborates this relation by further indicating whether it is to the side of, on the top of, or inside of, something that the thing in question is located. And this is achieved by means of a network in which the perceptual container and the perceptually contained are treated as the possessor and the possessed.

7. To many native speakers, this sentence is marginal rather than ungrammatical. On closer scrutiny, it is due to the dual functions of de. If de is understood as the potential infix meaning ‘can,’ then the sentence is grammatical; if it is understood merely as a modifying marker, then the sentence is ungrammatical. The marginality of this sentence for many speakers is therefore attributable to the dual interpretations of de.

8. At this point, we are not clear as to which principles of Chinese grammar have to refer to the ‘head,’ and which principles have to refer to the ‘information center.’ However, as the grammatical theory proposed in this writing continues to develop, we can envision that the structural ‘head’ may have more to do with the algorithmic system of language processing, and the ‘information center’ with the heuristic system of pragmatic inference.

9. See Hsieh (1989, in this volume) for a systematic extension of Tai’s temporal sequence principle by dividing time into real, inferred, and imaginary times.


11. The proposed experiential metaphor based on the law of gravity was suggested by Leon Serafim (personal communication).

12. In Fall, 1988, the Cognitive Science Lecture Series at the Ohio State University sponsored two lectures by linguists on the biological and psychological foundations of natural language. The first was by Geoffrey K. Pullum, who argued that the most widely held view of what linguistic theory is about, namely the view that it has the biology of the human brain as its ultimate object of study, is decidedly implausible. It is unnecessary to look to neurophysiology to find a secure subject matter to which linguistic theory can be anchored. Biologically verifiable facts about the language capacity of the human species are not of interest to grammatical theorists; nor should they be. And sound examples of universal generalizations about grammatical structure regularly show clear signs of having plausible, nonbiological sources, located deep enough in ecology and economics of information and cognition to be characteristic of not just human brain but also many other types of abstract systems. (from the published abstract of Pullum’s lecture).

In response, Wayne Cowart argued that

The phenomena of human speech comprehension reflect the activity of at least two distinct cognitive subsystems of quite different character. Only one of these mechanisms seems to implement an algorithmic system like that suggested by phonological, syntactic and semantic theory in linguistics. Thus, psychological research that seeks to tease apart the contributions of the two subsystems is relevant to the core concerns of linguistic theory. (from the published abstract of Cowart’s lecture.)

Our present focus on conceptually motivated rather than algorithmic aspects of linguistic structure is thus not only in clear contrast with Chomsky’s view of language and cognition, but is also different in many significant ways from the view held by Pullum as well as that by Cowart. As we develop the proposed cognition-based functional grammar of Chinese further, we will be able to elucidate our position more definitely and more distinctly from those of other linguists with regard to the fundamental question concerning language and human cognition.

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The Semantics of Causatives in Chinese

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A. Scope of This Study.

The causative constructions in Chinese have attracted much attention in the study of modern Chinese syntax due to the fact that they abound in the so-called resultative structures, especially resultative complements (cf. Chao 1968). But most literature in this area deals only with those causative constructions that involve the general relationship of actions (in Event₁) and results (in Event₂), where results specify states, e.g. 'wipe-dry' (cf. Huang 1974). I shall simplify the matter and refer to such cases as 'Agent-Patient' causatives.

This paper will, on the other hand, study what I shall call 'Agent-Agent' causatives, which specify the relationship of actions in Event₁ and actions in Event₂, e.g. 'make him leave.' These constructions have heretofore received scanty analysis, except in Chappell (1983).

Other possible causative relationships will not be dealt with in great length in this paper. For example, the relationship 'Patient-Agent' is quite common, e.g. 'The famine caused a great number of people to migrate northward.' So is 'Patient-Patient,' e.g. 'The move made him depressed.'

Whether a particular type of causative sentence in Chinese is literary or colloquial or whether standard or dialectal will not be our concern in this paper, either. For instance, the causative verb shì (使) may be felt to be more literary than jiě (解), but it can also be equally common in a specific community, e.g. among the better educated. And a particular usage of rànq (让) (see Section D) is not observed among Mandarin speakers in the south, particularly in Taiwan. But these matters will be ignored in this paper.

B. Defining Causative Verbs.

By causative verbs, I shall refer strictly to those which will fit the syntactic frame of 'Subject + Causative verbs + State verbs.' This specification has the