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CONCEPTUAL STRUCTURES OF CHINESE SPATIAL EXPRESSIONS

James H-Y. Tai
The Ohio State University

0. INTRODUCTION. In his work on conceptual semantics, Jackendoff (1983, 1990) proposed a set of universal conceptual formation rules for spatial expressions. This paper will evaluate Jackendoff's rules vis-à-vis Chinese spatial expressions and discuss some implications for his hypothesis of conceptual structure. The central issue to be addressed is whether a universal conceptual structure can be construed independent of different syntactic structures in different languages.*

I will first identify some systematic syntactic and semantic differences between Chinese and English in spatial expressions, then show that Jackendoff's rules fail to capture important generalizations in Chinese spatial expressions. I will suggest that the significance of Jackendoff's conceptual structure is largely predicated on the premise that the correspondence between conceptual structures and syntactic structures in a given language must be systematic and transparent. On this premise, I will argue that it is difficult, if not impossible, to construct a universal conceptual structure without being biased towards the particular language used in building that structure. In conclusion, I suggest two alternative approaches to conceptual structure. One is to allow different conceptual structures in different languages; the other is to continue to strive for a universal conceptual structure. I will discuss briefly some merits and demerits of each alternative. In this paper, I opt for the latter alternative, and suggest that we look into conceptual iconicity in natural languages as a starting point. Chinese, being pervasive in iconicity, offers a wealth of data for this purpose.

Section 1 contrasts Chinese spatial expressions with English ones. Both positional and directional spatial relations in the two languages will be examined, and Chinese equivalents of English locative prepositions will be identified. I will propose a semantic and syntactic analysis of these Chinese equivalents, pointing out a surprisingly high degree of transparency between the surface syntax and conceptual structure in Chinese. Section 2 evaluates Jackendoff's analysis of spatial expressions vis-à-vis Chinese data. In the course of discussion, it is demonstrated that, while Jackendoff's conceptual formation rules as formulated account for English spatial expressions systematically, they cannot apply to Chinese without losing generalizations. In section 3, I suggest two alternative approaches to modifying Jackendoff's conceptual structure hypothesis. I will ultimately opt for the alternative which incorporates conceptual iconicity and some general language-independent schemata, including those of whole-part and action-result.

1. CHINESE AND ENGLISH SPATIAL EXPRESSIONS. I shall begin with some illustrative sentences from Chinese. These sentences will also serve to show how certain universal functional principles of spatial expressions in natural languages apply to the Chinese language. For example, Chinese uses a reference object to locate a focal object, as illustrated in sentence (1a). (Sentences (1b) and (1c) are simply shorter versions of (1a).¹

- (1) a. Shu zai xiangzi-de litou.
 book be-located box-PRT inside
 'The book is in the box.'
 b. Shu zai xiangzi-litou.
 c. Shu zai xiangzi-li.

In (1), book (*shu*) is the focal object and box (*xiangzi*) the reference object. As pointed out by Talmy (1983), both focal and reference objects are idealized and schematized in terms of geometric relations. One important observation by Talmy is that natural languages generally characterize the geometry of focal object much more simply than that of the reference object. We typically simplify the geometry of a focal object into a geometric point, while preserving some particularity of the geometry of the reference object. For example, in (1), the specified physical shape of book is reduced to a geometric point, while box is treated as a three-dimensional geometric enclosure. Similarly, in (2), book is still a geometric point, but box is now construed as a two-dimensional plane.

- (2) a. Shu zai xiangzi-de shangmian.
 book be-located box-PRT top-side
 'The book is on the box.'
 b. Shu zai xiangzi shangmian.
 c. Shu zai xiangzi-shang.

Furthermore, given two objects in the same physical setting, one or the other object is chosen as the focal object, with the other serving as the reference object. Consider sentences (3) and (4):

- (3) Zidian zai benzi-de shangmian.
 dictionary be-located notebook-PRT top-side
 'The dictionary is on the notebook.'
 (4) Benzi zai zidian-de xiamian.
 notebook be-located dictionary-PRT bottom-side
 'The notebook is underneath the dictionary.'

Sentences (3) and (4) are inverse forms of a symmetric spatial relation. However, again, as pointed out by Talmy, when one of the two objects is perceived as

having a more permanent location than the other, a non-symmetric relation is usually preferred, namely, the more permanently-located object serves as the reference object. Examples are given in (5) and (6).

- (5) Shu zai zhuozi-de shangmian.
book be-located table-PRT top-side
'The book is on the table.'
- (6) ? Zhuozi zai shu-de xiamian.
table be-located book-PRT bottom-side
? 'The table is underneath the book.'

Observe that in Chinese as well in English, one would usually say (5) and not (6), by making the table the reference object.²

In short, those functional and cognitive correlates between the focal object and the reference object stated by Talmy (1983:230-231) hold for both Chinese and English, and presumably are universal. In addition, as pointed out by Herskovits (1986), the use of spatial expressions is governed by pragmatic factors, including relevance, salience, tolerance, and typicality. As an example of relevance, consider the space under a desk. It has three or four sides, and constitutes as good an enclosure as, say, water in a bathtub, as in sentence (7), which is a good sentence in both Chinese and English.

- (7) Shui zai yupen-de litou.
water be-located bathtub-PRT inside
'The water is in the bathtub.'

Yet, in neither language can one say sentence (8):

- (8) * Wo ba jiao shen zai zhuozi-de litou.
I BA legs stretch be-located desk-PRT inside
* I stretched my legs in the desk. (fr. Herskovits 1986)

However, with respect to other pragmatic factors, Chinese can be very different from English. For example, we use the preposition 'in' in English for all three situations in (9).³

- (9) a. the water in the vase
 b. the crack in the vase (i.e., on the surface of the vase)
 c. the bird in the tree

In contrast, in Chinese, only the situation in (9a) can be described by the expression *litou* 'inside'. The other two situations, (9b) and (9c), are described by the expression *shangmian* 'top-side'.

This particular example shows that the prototype for the concept of enclosure may have the same cognitive basis in both English and Chinese, while its extensions to other less ideal situations are different in the two languages. Following Herskovitz, we may say that English preposition 'in' and Chinese place word *litou* 'inside' have the same 'ideal meaning', but their pragmatics are different.⁴

The differences between English preposition 'on' and Chinese place word *shangmian* 'top-side' are much more complicated than the case of 'in' and *litou* 'inside'. Nonetheless, two systematic differences can be observed. First, as suggested by Herskovitz, we need at least two ideal meanings for 'on' in English. One meaning is 'X is contiguous with Y and Y supports X with Y's surface', as in 'the book on the table'. The other meaning is 'X is contiguous with Y and on the boundary of Y' as in 'the house on the lake'. These two meanings are stated in (10).

- (10) On₁: X is contiguous with Y and Y supports X with Y's surface
(e.g. the book on the table)
On₂: X is contiguous with Y and on the boundary of Y
(e.g. the house on the lake)

While the first meaning of 'on' can be expressed in Chinese by the place word *shangmian* 'top-side', the second meaning of 'on' needs to be expressed by other place words. For example, in the case of 'the house on the lake', the place word *pangbian* 'side' is used. Sentences (11) and (12) illustrate this difference between Chinese and English.

- (11) Shu zai zhuozi-de shangmian.
book be-located table-PRT top-side
'The book is on the table.'
(12) Fangzi zai hu-de pangbian.
house be-located lake-PRT side
'The house is on the lake.'

Concerning the second systematic difference between English 'on' and Chinese *shangmian*, it is important to note that English 'on' is clearly distinguished from 'above' and 'over', while Chinese *shangmian* is ambiguous. Thus, sentence (13) in Chinese can mean 'the lamp is on, above, or over the table'.

- (13) Deng zai zhuozi-de shangmian.
lamp be-located table-PRT top-side
'The lamp is on/above/over the table.'

This difference between English 'on' and Chinese *shangmian* is only a reflection of a more general systematic difference between English and Chinese with respect to the geometric schematization of spatial relations. That is, while English makes a further distinction between 'contact with' and 'adjacent to' within the category of 'contiguous with', Chinese does not. Hence, sentence (14) is ambiguous in the English translation.

- (14) Xiaohaizi zuo-zai zhuozi-de zuobian.
 child sit-be-located table-PRT left-side
 'The child is sitting on the left side/to the left of the table.'

Similarly, in English, Wisconsin is in the northern part of the United States but Canada is to the north of the U.S. In Chinese, this distinction need not be made, as illustrated in (15).⁵

- (15) Weisikangxin/Jia'nada zai Meiguo-de beibian.
 Wisconsin/Canada be-located U.S.A.-PRT north-side
 'Wisconsin is in the northern part of the United States.'/ 是
 'Canada is to the north of the United States.'

In short, despite the striking semantic and pragmatic differences between English 'on' and Chinese *shangmian*, it can be construed that Chinese *shangmian* shares with English 'on' an ideal meaning of 'X is contiguous with Y's surface'. The ideal meanings of *litou* and *shangmian* in Chinese can be tentatively stated as in

- (16) X zai Y-de litou = be located (X, interior (Y)) (= in)
 (17) X zai Y-de shangmian = be located (X, surface (Y)) (= on₁)

(16) and (17) partially correspond to English 'in' and 'on' in geometric descriptions. Along with this analysis, the Chinese equivalent of 'at' can be represented as

- (18) X zai Y = be located (X, (Y)) (= at)

In (18), there is no need to specify dimensionality in the geometric description of the reference object. In other words, both the focal object and the reference object are construed as two points coinciding with each other. In surface syntax, Chinese simply omits the place word and the modifier marker *-de*. This can be illustrated by (19).

- (19) Ta zai jia.
 he be-located home
 'He is at home.'

(16), (17), and (18) above will now serve as a starting point to analyze syntactic differences between English locative preposition 'in', 'on', 'at', and their equivalents in Chinese. Using the semantic representation in (16), sentence (1a) in Chinese can be analyzed as

- (20) *zai* (shu, litou (xiangzi))
 be-located (book, inside (box))

As illustrated in (20), the relational predicate 'to be located' is expressed in Chinese by the word *zai*, which can be construed as a copula on a par with the Chinese copula verb *shi* 'to be'. The interior is expressed by the place word *litou* 'inside'. The interior function over Y is expressed in surface syntax as a modifier-head construction, namely, *xiangzi-de litou*. There is clear evidence that the place word itself is also a noun (cf. Ernest 1988). Thus, in the expression *xiangzi-de litou*, the noun *xiangzi* serves as the modifier and the noun *litou* as the head. In this respect, Chinese syntax conforms to a universal rule of mapping the functor as the head, and the argument as the modifier.⁶

In surface syntax, the modifier marker *-de* is often omitted, and the place word modified by the reference object in the *zai* phrase can be reduced to a bound suffix. For instance, the modifier marker *-de* in sentence (1a) can be deleted, giving sentence (1b), which in turn can be further reduced into (1c).⁷ There are cases, as in (19), where the entire place word along with the modifier marker *-de* appears to be deleted. In our present analysis, I have taken the position that in these cases, the dimensionality in the geometric description of the reference object is zero, namely, a point. In other words, (19) is a result not of the further reduction of the bound locative suffix *-li* from *jia-li*, but a result of the non-specification of dimensionality. The proposed analysis thus accommodates those situations in which the locative *zai* phrase requires neither the whole place word nor its reduced suffix form.⁸

It can be readily discerned at this point that the mapping from semantics to syntax involving spatial expressions appears to be more transparent in Chinese than in English. As Hsieh (1989) puts it, English employs a one-step strategy by using prepositions 'at', 'on' and 'in' to stand for one-, two-, and three-dimensional spatial relations. By contrast, Chinese employs a two-step strategy. In the first step, the copula verb *zai* 'to be located at/on/in' is used to indicate that the relation in question is a spatial relation of some kind. In the second step, place words such as *shangmian* and *litou* are used to further indicate whether the focal object is on the surface of, or inside, the reference object.

Furthermore, although the surface or interior of an object does not necessarily constitute a part of an object, it does refer to a region defined by it. In other words, if the reference object defines the whole region, a part of the reference object defines a subregion. Thus, the whole-part relation holds for a description of the geometric relationship between the reference object and a subregion where

the focal object is located. Therefore, there is motivation for Chinese locative relations to be expressed in modifier-head constructions parallel to partitive and possessive constructions in this language. This is illustrated in (21).

- (21) a. *zhuozi-de shangmian* = the surface of the table
 b. *zhuozi-de tui* = the legs of the table
 c. *wo-de tui* = my legs

At this juncture, it is important to mention Brugman's study of spatial locations in Mixtec, cited in Lakoff (1987:313-337). In Mixtec, body-part terms are metaphorically projected onto the subregions defined by the reference object. Similarly, in Tzotzil (León 1993), body parts are systematically projected for locative expressions. Although Chinese is not as systematic as Mixtec and Tzotzil, there are some clear cases of this kind of projection, as shown in (22).

- (22) a. *shan-tou* = the top of a mountain
 mountain-head
 b. *shan-yao* = halfway up a mountain
 mountain-waist
 c. *shan-jiao* = the foot of a mountain
 mountain-foot

Taken together, these three languages—Mixtec, Tzotzil, and Chinese—show that the whole-part schema is one important conceptual schema for describing spatial locations.

I have so far dealt with the internal structure of the locative *zai* phrase. It is worth pointing out one very important generalization regarding the syntax and semantics of *zai* phrases as a whole in Chinese sentences. This pertains to the word order of *zai* phrases with respect to the main verb. I have demonstrated elsewhere (Tai 1975) that, whereas Chinese preverbal locatives denote the location of an event, postverbal locatives denote the location of a participant of an event as the result of the action taken. This semantic contrast is illustrated in (23) and (24).

- (23) a. *Xiaohaizi zai zhuozi-shang tiao.*
 child be-located table-top jump
 'The child is jumping on the table.'
 b. *Xiaohaizi tiao zai zhuozi-shang.*
 child jump be-located table-top
 'The child jumped onto the table.'

- (24) a. Xiaohaizi *zai* *zhuozi-shang* xie zi.
 child be-located table-top write characters
 'The child wrote characters (on a piece of paper) at the table.'
- b. Xiaohaizi ba zi xie *zai* *zhuozi-shang*.
 child BA characters write be-located table-top
 'The child wrote the characters on the surface of the table.'

In (23a), the preverbal *zai* phrase denotes the location where the action of jumping took place; in (23b), the postverbal *zai* phrase denotes the location of the child as a result of his jumping. Sentences (24a) and (24b) exhibit the same semantic contrast. More importantly, (24b) necessarily entails that 'the characters are written on the surface of the table', whereas (24a) does not necessarily have such entailment. Thus, in terms of inference regarding the location of an entity (object or being), postverbal *zai* phrases encode 'logical' inference. In contrast, inference by means of preverbal *zai* phrases is only 'pragmatic'. In this respect, Chinese surface syntax is again more transparent than English: the fundamental difference between the two types of inference regarding locations of an entity is coded in Chinese syntax, but not in English syntax.⁹

We have seen how static, positional spatial relations are expressed in Chinese grammar. We now proceed to examine directional, dynamic spatial relations. In Chinese, while positional spatial relations are expressed by *zai* phrases, directional spatial relations are expressed either by co-verb (prepositional) phrases, as shown in (25), (28) and (29), or by resultative verb compounds, as shown in (26) and (27).

- (25) Ta *cong gongyuan* chufa.
 he from park start
 'He started from the park.'
- (26) Ta *zou-jin gongyuan*.
 he walk-enter park
 'He walked into the park.'
- (27) Ta *chuan-guo gongyuan*.
 he pierce-pass park
 'He walked through the park.'
- (28) Ta *yan-zhe gongyuan* pao.
 he follow-ASP park run
 'He ran along (the side of) the park.'
- (29) Ta *rao-zhe gongyuan* pao.
 he circle-ASP park run
 'He ran around the park.'

In (25), the reference object 'the park' is the beginning point of a path. In (26), the reference object 'the park' is the goal or endpoint of the path. In (27), both the

beginning and the ending point of the path are within the boundary of the park. In (28) and (29), the reference object 'the park' defines a path without specifying either a beginning or ending point. It can be observed that if the ending point of the path is relevant, the resultative verb compound must be used to express a directional spatial relation (e.g., (26) and (27)). If the ending point of the path is not relevant, co-verb phrases are used (e.g., (28) and (29)).

The word order in (25) through (29) can be accounted for by the principle of temporal sequence (Tai 1985). In (25), the starting point precedes the action. In (26) and (27), the ending point is at the end of a motion, therefore follows the action. Now the path without a beginning or ending point simply serves as a background for the foregrounded action, therefore co-verb phrases before the verb in (28) and (29).¹⁰

As a final point in this section, it is worth noting that in contrast with Chinese, both positional and directional spatial relations in English are expressed by prepositional phrases.

2. JACKENDOFF'S ANALYSIS OF SPATIAL EXPRESSIONS. We turn now to Jackendoff's conceptual semantics. Jackendoff has proposed a level of representation called 'conceptual structure' which mediates between syntactic structures and the perceptual world of vision and action. The level of conceptual structures is a level of mental representation at which linguistic, sensory, and motor information are compatible. It is the level where the rules of inference are made in natural languages. Conceptual structures are generated by conceptual formation rules, just as syntactic structures are generated by syntactic formation rules. Conceptual structures are linked to syntactic structures by correspondence rules.

It appears that Jackendoff would like to see a systematic and transparent correspondence between syntactic structure and conceptual structure for at least two reasons. One reason is to avoid arbitrary mapping so that certain generalizations can be captured. The other reason is that transparency facilitates the mapping between form and meaning in language learning.¹¹ The transparency of mapping is, moreover, an important criterion, and is required by the constraint of compositionality in some contemporary syntactic theories such as Montague and categorial grammars. Thus, noteworthy is Newmeyer's (1992) argument that generative grammar, in conjunction with Jackendoff's semantic theory, is able to account for the fact that grammatical structure is an iconic reflection of conceptual structure. His argument hinges on the assumption that Jackendoff's conceptual semantics provides transparent motivations for compositionality in surface syntax. Thus, even in generative grammar, the transparency of correspondence between conceptual structure and syntactic structure is much to be desired, especially if Newmeyer's central argument is to be maintained.

Jackendoff's conceptual formation rules operate on a vocabulary of conceptual categories such as THING, PLACE, PATH, EVENT, AND STATE.

These conceptual categories are ontological categories in nature, and have been referred to by Jackendoff as "semantic parts of speech." Each of the conceptual categories can be further elaborated into a function-argument organization. Two of the most important conceptual formation rules formulated by Jackendoff (1990:43) for the spatial domain are presented here in (30) and (31).

$$(30) [\text{PLACE}] \rightarrow [{}_{\text{Place}} \text{PLACE-FUNCTION} ([\text{THING}])]$$

$$(31) [\text{PATH}] \rightarrow [{}_{\text{Path}} \left\{ \begin{array}{c} \text{TO} \\ \text{FROM} \\ \text{TOWARD} \\ \text{AWAY-FROM} \\ \text{VIA} \end{array} \right\} \left(\left[\left\{ \begin{array}{c} \text{THING} \\ \text{PLACE} \end{array} \right\} \right] \right)]$$

Rule (30) says that the conceptual constituent of the category PLACE can be elaborated as a place-function plus an argument of the category THING. The reference object serves as an argument for the PLACE-FUNCTION to define a region. For example, in the expression 'in the box' in sentence (1a), the box designates a reference object and the preposition 'in' serves as a place-function which maps the box into the region inside it. Similarly, rule (31) elaborates on the conceptual constituent of the category PATH as one of the five functions that map a reference THING or PLACE into a PATH. For example, in the expression 'to the park', the preposition 'to' serves as PATH function, mapping the reference object 'park' to a PATH. It should be noted that rule (30) deals with positional spatial relations, and rule (31) with directional spatial relations. For both rules, English spatial prepositions are construed as abstract functions which map reference objects into regions or paths.

One of the interesting results of this kind of treatment is that English prepositions are no longer two-place predicates but one place function mapping reference objects into PLACE or PATH. We have seen earlier in the semantic representation in (16) and (17) that the place word in Chinese serves as a functor mapping reference objects into regions. In this respect, Jackendoff's rule (30) has merit in that the conceptual structure of positional spatial relations in English is now closer to that in Chinese. However, in rule (30), PLACE-FUNCTION's appear to be abstract functors representing positional spatial prepositions in English. In contrast, Chinese grammar uses place words such as *litou* and *shangmian* to be modified by reference objects in terms of the whole-part schema. If conceptual structures underlying natural languages are to be universal and closely linked to our sensory and motor systems, as Jackendoff's hypothesis of conceptual structure claims to be, then (30) is short of being a genuine universal conceptual formation rule, since it does not reveal the conceptual structures in Chinese.¹²

Now let us examine conceptual formation rule (31) concerning the conceptual constituent PATH. We have seen earlier in examples (25) through (29)

that Chinese grammar uses two distinctively different syntactic patterns to express PATH, namely, co-verb phrases, as in (25), (28), and (29), and resultative verb compounds, in (26) and (27), where path has an explicit endpoint. If we adopt (31) for Chinese conceptual structures, we would not be able to capture the generalizations in Chinese grammar.¹³ It is significant to note here that resultative verb-compounds in Chinese also serve to express two other types of situations, as illustrated in sentences (32) and (33).

- (32) Ta da-si-le yige ren.
 he hit-die-ASP one person
 'He killed someone.'
- (33) Ta jia-cuo-le ren.
 she marry-wrong-ASP person
 'She married the wrong person.'

Clearly, as illustrated in (32) and (33), as well as in (26) and (27) earlier, Chinese grammar uses one single conceptual schema. That is, it uses an action-result schema to structure three types of situations involving result. From the translations of the Chinese sentences, we can see that these three types of situations are represented in three very distinctive syntactic patterns in English. Again, if we want to keep a transparent correspondence between conceptual structure and syntactic structure, we should have a conceptual formation rule based on the action-result schema for Chinese grammar. This conceptual formation rule may turn out to be closer to Jackendoff's conceptual formation rule, given in (34) below (Jackendoff 1990:43). Even then, however, we still cannot explain why the domain of application of (34) in Chinese is so drastically different from that in English.

$$(34) \text{ [EVENT] } \rightarrow \left[\underset{\text{Event}}{\text{CAUSE}} \left(\left[\left\{ \begin{array}{c} \text{THING} \\ \text{EVENT} \end{array} \right\} \right] \cdot \text{[EVENT]} \right) \right]$$

In short, I argue that the formation rules for spatial expressions proposed by Jackendoff cannot apply to Chinese grammar without distorting significant generalizations of the conceptual structure in Chinese. My argument are based on three highly desirable and related premises centering around the crucial property of transparency in correspondence between conceptual structure and syntactic structure. They are:

- (35) a. Correspondence rules must be systematic and principled.
 b. The compositionality in syntactic structure should reflect that in conceptual structure.
 c. Transparency in correspondence rules facilitates communication and learning.

3. CONCLUSION. As often is the case in linguistic theories, an object language tends to bias us toward a meta-language convenient for the description of the object language. Jackendoff's conceptual formation rules for spatial relations are biased toward English grammar. They cannot be applied to Chinese grammar without losing some important generalizations. Nonetheless, given many merits of Jackendoff's conceptual semantics, we are certainly tempted to maintain his hypothesis of conceptual structure.

Faced with systematic differences between Chinese and English spatial expressions, there are basically two alternative approaches to modifying Jackendoff's hypothesis of conceptual structure. One is to allow different languages to have different conceptual structures. This amounts to the acceptance of Quine's ontological relativity, that we cannot go beyond the expressions of a language to uncover its ultimate ontological world. The merit of such an approach is that a maximal syntax-semantics match-up in each individual language can be maintained. However, this relativist approach to conceptual structure would greatly reduce the significance of Jackendoffian conceptual structure, which is meant to be at the level where innate and universal linguistic information interfaces with visual and motor information.¹⁴

The other alternative is to construct a universal conceptual structure independent of individual languages. This universal conceptual structure would, in part, consist of general cognitive principles of human beings, including the whole-part schema and the action-result schema. I believe this view of conceptual structure is within the purview of Jackendoff's conceptual semantics. The approach would be able to maximize syntax-semantics match-up in languages such as Chinese, which is largely semantics-based, conceptually-oriented, and permeated with iconicity. It would, however, obscure the apparent syntax-semantics match-up in more syntax-based languages such as English. As a consequence, it would undermine Newmeyer's (1992) argument that generative grammar, with Jackendoff's semantic theory, has already provided a good account of structure-concept iconicity.

At this stage of my research on Chinese grammar, the latter approach is preferred, as it enables us to capture the syntax-semantics match-up in Chinese grammar. That approach also allows us to recognize a fundamental typological difference between Chinese and English. That is, Chinese grammar is more conceptually-oriented and more iconic than English grammar, and Chinese has grammaticalized some general cognitive schemata. We have seen here that in Chinese, the positional spatial relations are structured by the whole-part schema, and the directional spatial relations by the action-result schema. These two schemata are not merely discourse principles which have become accidentally grammaticalized in Chinese grammar, as Newmeyer has suggested. They are, in fact, conceptual schemata which underlie and shape many other aspects of Chinese grammar (cf. Tai 1985, 1989).¹⁵

Finally, as I have demonstrated elsewhere (Tai 1985, 1992, 1993), iconic motivations pervade throughout Chinese grammar. The fact that both the whole-part and the action-result schemata are deeply entrenched in Chinese spatial expressions is another clear manifestation of the pervasiveness of iconicity in this language. I hope that further study of iconicity in Chinese syntax and other languages will aid in constructing a more genuinely universal conceptual structure than is currently formulated in Jackendoff's conceptual semantics.

NOTES

* This paper was originally presented at 29th CLS Parasession on Conceptual Representations under the title, "A non-objectivist view of Jackendoff's conceptual semantics". The contents of the paper have remained largely unchanged. The original title was chosen with the intention of addressing more philosophical issues than linguistic ones.. The present title reflects more appropriately the linguistic issues that were raised in the paper. I have benefited from questions and comments at the CLS conference, particularly those raised by George Lakoff, Salikoko Mufwene, and Eric Schiller. The graduate students in my Spring 1993 seminar on Chinese linguistics at the Ohio State University gave me many useful comments. I am especially grateful to Hsin-I Hsieh and Marjorie Chan who have read the original version and provided me with valuable criticisms and comments. Needless to say, I am solely responsible for any errors that remain.

1. The abbreviation PRT is used to gloss the particle, -de, as a marker of explicit modification (Chao 1968:285). In this paper, I treat (1b) and (1c) as reduced forms of (1a), and use (1a) as the basis for analysis. Ernest (1988) gives convincing arguments for treating unreduced long forms of place words as nouns, and reduced bound forms, as in (1c), as some kind of postpositions. Here, I will not take a position on whether or not the bound form in (1c) is a postposition. For the purpose of this paper, I will use the full form (1a) for analysis and discussion.

2. A more striking non-symmetric relation between the focal and the reference object can be found in the following pair of examples involving moving (human) beings and permanently-located objects:

- (i) Ren zai men-wai.
 person be-located door-outside
 'The person is outside the door.'
- (ii) * Men zai ren-nei.
 door be-located person-inside
 '* The door is inside the person.'

3. The phrases in (9) are diagrammed in Figure 1 in Herskovits (1988:275).

4. The pragmatic differences between *litou* 'inside' and *shangmian* 'top-side' are complicated and require a detailed treatment before any general observations can be made.

5. The systematic ambiguity illustrated in (13), (14) and (15) can be removed either by using more specific place words, or by further modifying the place word with other place words. In (13), for example, instead of *shangmian* 'top-side', the place word *shangfang* 'top-place' can be used to indicate 'above' and *zheng shangfang* 'right top-place' to indicate 'over'. In (14), the place word *zuobian* 'left-side' can be further modified by *shangmian* to form the expression *zhuozi-de shangmian de zuobian*, which would mean 'the left-side on the surface of the table'. Similarly, in (15), instead of the place word *beibian* 'north-side', the place word *beibu* 'north-portion' can be used to specify that Wisconsin is in the northern part of the United States.

6. This interpretation is consistent with the standard analysis of syntactic heads as semantic functors in the literature. See Zwicky (1985) for an enlightening discussion of syntactic heads.

7. The assumption of this two-step sequential reduction would also explain the ungrammaticality of the expression *xiangzi-de li*.

8. See Zhou (1993) for some semantic and pragmatic conditions on the occurrence of locative suffixes.

9. See Tai (1976) for an attempt to formulate logical forms for these two types of inferences à la Davidsonian event analysis.

10. The flow of background information to the foreground information can be construed as following temporal sequence in thought flow, since the background information precedes the foreground information in the arrangement of idea units. Ordering of foreground information before background information is also reflected in topic-comment constructions commonly found in Chinese. Thus, it is possible to extend the temporal sequence principle to word order of background before foreground, and packaging in topic-comment constructions. Alternatively, we can extend the whole-before-part word order in Chinese to background-before-foreground sequence. At present, I cannot ascertain which of the two principles (whole-before-part or temporal sequence) applies here, and shall leave this issue for future research.

11. For example, Jackendoff (1991:21) argues that his conceptual representation of English plurals gives the correspondence rules a property of 'morphological transparency'.

12. For Jackendoff (1991), these functors are further decomposed into cognitive primitives. In addition, the functor, PART, is used to express the partitive construction, as in 'a leg of the table'. However, for reasons that I do not understand, Jackendoff has not extended the whole-and-part analysis to map out

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the relationship between functor and argument for positional place functions expressed by 'in' and 'on'.

13. It is crucial that we distinguish the notion of path in our mental representation for psychological behaviors from the notion of path in our mental representation for linguistic behaviors. Like other human beings or living organisms, the Chinese have a notion of PATH in their mental representation of spatial relations. However, this does not mean that the conceptual formation rule (31) must be part of the Chinese grammar, let alone part of innate universal grammar.

14. Admittedly, we cannot know the structure of reality objectively. We know them partly through the language we use. Yet, insofar as spatial relations are concerned, there seems to be universal perceptual structures for all the human beings. If Jackendoff's hypothesis of conceptual structure is not to be abandoned totally, the question then is: how does each individual language link its subjective conceptual structure to the relatively objective perceptual structure for communication purposes? Perhaps further studies of the correspondence rules between conceptual structure and visual/motor systems can shed some light to provide a satisfactory answer.

15. These two schemata are two fundamental frameworks of conceptualization not only for human beings but also for animals. Without these two conceptual frameworks, rules of inference in conceptual structure would be impossible.

BIBLIOGRAPHY

- BENNETT, D.C. 1975. Spatial and temporal uses of English prepositions: An essay in stratificational semantics. London: Longman.
- BRUGMAN, CLAUDIA. 1983. The use of body-part terms as locatives in Chalcatongo Mixtec. In Report No.4 of the survey of California and other Indian languages, 235-90. University of California, Berkeley.
- CHAO, YUEN REN. 1968. A grammar of spoken Chinese. Berkeley: University of California Press.
- ERNST, THOMAS. 1988. Chinese postpositions? -again. *Journal of Chinese Linguistics* 16.2:219-244.
- HERSKOVITS, ANNETTE. 1986. Language and spatial cognition: An interdisciplinary study of the prepositions in English. Cambridge: Cambridge University Press.
- . 1988. Spatial expressions and the plasticity of meaning. *Topics in cognitive linguistics*, ed. by Brygida Rudzka-Ostyn, 271-297. Amsterdam: John Benjamins.
- HSIEH, HSIN-I. 1989. Time and imagery in Chinese. *Functionalism and Chinese grammar*, ed. by James Tai and Frank Hsueh, 45-94. Chinese Language Teachers Association, Monograph Series Number 1.

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- JACKENDOFF, RAY. 1983. *Semantics and cognition*. Cambridge: MIT Press.
- _____. 1990. *Semantic structures*. Cambridge: MIT Press.
- _____. 1991. Parts and boundaries. *Cognition* 41:9-45.
- LAKOFF, GEORGE. 1987. Women, fire, and dangerous things: What categories reveal about the mind. Chicago: University of Chicago Press.
- de LEÓN, LOURDES. 1993. Shape, geometry and location: the case of Tzotzil body part terms. Paper presented at the Parasession of the 29th CLS meeting, Chicago, Illinois.
- MILLER, GEORGE A. and PHILIP N. JOHNSON-LAIRD. 1976. *Language and perception*. Cambridge: Harvard University Press.
- NEWMAYER, FREDERICK. 1992. Iconicity and generative grammar. *Language* 68:756-796.
- TAI, JAMES H-Y. 1975. On two functions of place adverbials in Mandarin Chinese. *Journal of Chinese Linguistics* 3.2/3:154-179.
- _____. 1976. Semantics and syntax of inner and outer locatives. *Proceedings of the 1976 Mid-America Linguistics Conference*, University of Minnesota, 393-401.
- _____. 1985. Temporal sequence and Chinese word order. *Iconicity in Syntax*, ed. by John Haiman, 49-72. Amsterdam: John Benjamins.
- _____. 1989. Toward a cognition-based functional grammar of Chinese. *Functionalism and Chinese grammar*, ed. by James Tai and Frank Hsueh, 187-226. Chinese Language Teachers Association, Monograph Series No. 1.
- _____. 1992. Category shifts and word-formation redundancy rules in Chinese. *Proceedings of the Third International Symposium on Chinese Languages and Linguistics*, ed. by H. Samuel Wang and Feng-fu Tsao, 1-19. Taipei, Taiwan: National Tsing Hua University.
- _____. 1993. Iconicity: motivations in Chinese grammar. *Principles and prediction: The analysis of natural language (Papers in honor of Jerry Sanders)*, ed. by Mushira Eid and Gregory Iverson, 153-174. Amsterdam: John Benjamins.
- TALMY, LEONARD. 1983. How language structures space. *Spatial orientation: Theory, research, and application*, ed. by Herbert L. Pick and Linda P. Acredolo, 225-282. New York: Plenum Press.
- ZHOU, LIETING. 1993. On spatial implications of Chinese nouns and occurrence conditions of localizers. Manuscript, OSU.
- ZWICKY, ARNOLD M. 1985. Heads. *Journal of Linguistics* 21:1-29.