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In Papers from the Parasession on Conceptual Representations,  
CLS29 Vol.2 pp. 347-362. Chicago: Chicago Linguistic Society, 1993

## CONCEPTUAL STRUCTURES OF CHINESE SPATIAL EXPRESSIONS

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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).<sup>1</sup>

- (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.<sup>2</sup>

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).<sup>3</sup>

- (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.<sup>4</sup>

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) On<sub>1</sub>: X is contiguous with Y and Y supports X with Y's surface  
(e.g. the book on the table)  
On<sub>2</sub>: 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).<sup>5</sup>

- (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.'  
 '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)) (= on<sub>1</sub>)

(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.<sup>6</sup>

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).<sup>7</sup> 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.<sup>8</sup>

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

