Readings in Chinese Transformational Syntax

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The Crane Publishing Co., Ltd.
6-1, 109 Ho-ping East Road, 1st Section
Taipei, Taiwan Republic of China

January 1985
SEMANTICS AND SYNTAX 
OF
INNER AND OUTER LOCATIVES

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1. INTRODUCTION

In traditional syntactic theories, the class of adverbial constructions has served virtually as a wastebasket for a variety of linguistic entities which bear different semantic relations to different parts of a sentence. The concept of ‘modification’ is just as vague as that of ‘adverbial’, and accordingly the concept of ‘adverbial modification’.

Logicians concerned with natural languages have generally adopted the view that the semantic function of an adverbial is to map properties of a predicate into new properties. While this view enables logicians to characterize adverbials as logical operators within the framework of modal logic, it provides linguists little semantic insights on the basis of which they can hope to understand syntactic behaviors of different types of adverbials in different languages. Obviously, the operator theory merely translate the surface form of a sentence into logical form. In this respect, the operator theory is not unlike Chomsky’s Aspect theory, in which the surface forms of adverbials are built into the phrase structure component.

In his theory of ‘natural logic’, Lakoff (1972) has proposed that adverbials be derived from underlying predicates. He has specifically argued against the operator theory and proposed to treat adverbs like ‘carefully’ as underlying predicates predicated on arguments rather than on predicates. Lakoff’s theory of adverbials within the framework of generative semantics is compatible with an earlier theory of action sentences proposed by Davidson (1967), in which events are treated as individuals and adverbials are predicated on events. In both theories, adverbials can be formalized within the framework of first-order logic.

Harman (1972) has proposed a theory of logical forms for different types of adverbials along the line of generative semantics. The first type of adverbials he has chosen to discuss is about place adverbials. He has convincingly argued that place adverbials can be better analyzed in terms of Davidson’s event analysis than in terms of the operator approach. The purpose of this paper is to discuss some semantic properties of place adverbials which have escaped Harman’s attention and to propose a more comprehensive theory of place adverbials based on Davidson’s event theory.

2. DAVIDSON-HARMAN’S ANALYSIS

According to Harman, on Davidson’s event analysis, sentence (1) has the form (2).

(1) John walked in the street.
(2) (3e) (Wje & Pe & Ies)
The form (2) says to the effect that for some event, John walks in the event, the event is past, and the event is located in the street. Harman has correctly contended that if we analyze place adverbials as in (2), many obvious, logical implications to be accounted for are purely logical instances of the quantificational rule that any sentence of the form (3) implies the corresponding sentence of the form (4).

\[(3) \ (\exists e) \ (Fx \ & \ Gx)\]
\[(4) \ (\exists e) \ (Fx)\]

Davidson's event analysis therefore needs not extra axioms for the entailment relationship between 'John walked in the street' and 'John walked'. However, Harman has not discussed the entailment relationship between 'John walked in the street' and 'John was in the street'. Obviously, we cannot infer 'John was in the street' from sentence (1) by the logical form (2). We need additional axiom like (5) to do the job.

\[(5) \ (\exists e) \ (Wje \ & \ les) \ \rightarrow \ (\exists e) \ (Ise)\]

The form (5) says that if John has performed the action of walking in an event and this event occurs in the street, then it is necessary for John to be in the street where the event takes place.

Geis (1974) has proposed that the function of place adverbials is to locate the participants of states of affairs and actions in space, and not to locate states of affairs and actions in space. According to his theory, sentence (1) should have the logical form (6) instead of (2).

\[(6) \ (\exists t) \ (Wjt \ & \ Pt \ & \ Ist)\]

The form (6) says to the effect that for some time, John walks in the time, the time is past, and John is in the street in the time. Without axiom (5), we can infer both 'John walked' and 'John was in the street' from sentence (1) through the logical form (6). Similarly, sentence (7) can be represented as (8).

\[(7) \ John \ kissed \ Mary \ in \ the \ street\]
\[(8) \ (\exists t) \ (Kjmt \ & \ Pt \ & \ Jsst \ & \ Illst)\]

By Quine's criterion of using the bound variable, e in (2) and t in (6) carry different ontological commitments. Leaving ontological considerations aside, Geis analysis seems to be more attractive than Davidson-Harman's analysis. For Geis' analysis requires no extra axioms like (5) to infer the location of a participant of an action or a state of affairs.

There is, however, one fundamental difficulty facing Geis' treatment. Consider the
entailments in sentences like (9)–(14).

(9) John was boiling rice in the pan.
(10) John was catching fishes in the water.
(11) John was building a tree house in the backyard.
(12) John was baking a cake in the oven.
(13) John wrote Chinese characters at the table.
(14) John wrote Chinese characters on the blackboard.

Sentence (9) doesn’t entail ‘John was in the pan’, although it does entail ‘the rice was in the pan’. Sentence (10) is ambiguous in that John may or may not be in the water. One might want to suggest that while the actor may or may not be located in the place specified by the place adverbial, the recipient of the action must be. This suggestion can be rejected by sentence (11), which entails ‘John was in the backyard’, but not ‘a tree house was in the backyard’. Notice that a tree house can exist in the backyard only after it has been built. Similarly, a cake doesn’t exist during the process of baking. Sentence (12) therefore entails neither ‘John was in the oven’ nor ‘a cake was in the oven’. For a different reason, sentence (13) entails neither ‘John was on the table’ nor ‘the characters were on the table’. Normally, the implication in (13) is ‘the characters were on papers’. In contrast with (13), sentence (14) normally implies ‘the characters were on the blackboard’.

(9)–(14) sentences suggest two important things. First, the semantic function of place adverbials is to locate actions and states of affairs in space, and not, as Geis has proposed, to locate participants or concrete objects in space. Second, the inference of the location of a participant of an action or a state of affairs on the basis of the accompanying place adverbial depends on different types of verbs as well as actual pragmatic conditions. The contrast between (13) and (14) clearly shows that we can predict the entailment in question solely on basis of different types of verbs. Faced with sentences like (9)–(14), we have to turn back to Davidson-Harman’s event analysis. A reasonable solution that I can envisage is to complement logical forms like (2) with a set of axioms like (5) for the inference of the location of a participant of an action or a state of affairs from logical forms like (2). I do not know how to exactly formalize the different entailment patterns exhibited in sentences like (9)–(14).

3. INNER Vs. OUTER LOCATIVES

A semantic theory of place adverbials can not be sufficient without accounting for the functional difference between the locative in (15) and that in (16).
The contrast between (15) and (16) was first pointed out by Hall (1965) in her MIT dissertation. A distinction between 'obligatory' and 'optional' locative expressions as well as that between 'inside the VP' and 'outside the VP' was made to account for the difference between (15) and (16) with regard to the locative. For the purpose of discussion, we shall adopt the term 'inner locative' to refer to the place adverbial in (15), and the term 'outer locative' to refer to that in (16).²

It should be pointed out that while the outer locative is always optional, the inner locative may also be optional for some verbs. This can be illustrated by (17) and (18).

(17) John washed the car (in the garage). (outer)
(18) John parked the car (in the garage). (inner)

It can be intuitively detected that while the place adverbial 'in the garage' in (15) and (18) 'denotes the location of John's car, in (17) it denotes the location of the event 'John washed the car'. A generalization can be advanced that while the semantic function of an inner locative is to locate a recipient of an action, the semantic function of an outer locative is to locate an event.

This generalization can be justified on both semantic and syntactic grounds. Since the function of an inner locative is to locate the recipient of an action, a proposition with an inner locative X necessarily entails that the recipient of the action is located at X. On the other hand, since an outer locative is to locate an event, a proposition with an outer locative Y doesn't necessarily entail that a participant of the event is located at Y. This difference in entailment can be illustrated by the following pair of sentences.

(19) ta zai zhuozi-shang xie zi 
He wrote the characters at the table.

(20) ta ba zi . xie zai zhuozi-shang
OM
He wrote the characters on the surface of the table.

It can be observed that while (20) necessarily entails that the characters were on the table, (19) doesn't necessarily so entail. In (20), the characters can be written on paper or on something else, and not necessarily on the surface of the table.

There is also cross-linguistic syntactic evidence supporting the validity of this semantic
distinction. I have elsewhere (Tai, 1975) shown that this distinction serves as the semantic basis for the surface distribution of preverbal versus postverbal locatives in Mandarin Chinese and for the word order changes involving locatives from classical Chinese to modern Chinese. My recent investigation in Japanese syntax also reveals that the ni/de distinction can be better understood by this semantic distinction than by the treatment of ni as a particle expressing goal. Detailed facts and arguments aside, (21)–(24) sentences illustrate the explanatory power of this semantic distinction.

(21) John ba chezi fang zai chefang-li OM car keep at garage-inside

(22) John zai chefang-li xi chezi wash car

(23) John wa shako ni kuruma o iremashita garage car keep

(24) John wa shako de kuruma o araimashita wash

(21) and (22) show that in Chinese while the inner locative occurs postverbally, the outer locative occurs preverbally. (23) and (24) show that in Japanese the inner locative is marked with the ni particle, whereas the outer locative is marked with the de particle.

Further syntactic evidence can be obtained from Kapampangan, a Philippine language. Mirikitani (1972) has made a distinction between ‘general location’ adverbs and ‘locative terminus’ prepositional phrases in order to account for some interesting phenomena of locatives in this language. He observes that while ‘general location’ adverbial phrases are always indicators of time, manner or general location and may never be selected as the subject of a sentence, ‘locative terminus’ prepositional phrases are related by case to the predicate of the sentence in a number of semantic relations and they may be selected as subject of a sentence. For example, the locative in (25) cannot be focused, but the locative in (26) can be focused or subjectivized.

(25) magobra ya i Juan king bangko king Waikiki AF=Agent Focus
   AF+work he SM John LgM bank LgM
   John works in a bank in Waikiki LgM=Locative Marker

(26) pisulatan ne ng poesia ning lalaki ing blackboard LF + write he-it OM poem AM boy SM

The blackboard will be written a poem by the boy.
It seems to be clear that while 'general location' adverbial phrases in Kapampangan have the semantic function of outer locatives, 'locative terminus' prepositional phrases have the semantic function of inner locatives.

It should be clear that the place adverbials which we have discussed in Section 11 cover only 'outer' locatives, and that the logical form (2) cannot represent a proper analysis for sentences with 'inner' locatives. The question now is: within the framework of Davidson's event theory, what should be the logical form for sentences with inner locatives. Let us first consider the semantics of sentences like (27).

(27) John drove the car into the garage. (at time t)

(27) entails (28) and (29).

(28) Before the time t, the car was not in the garage.
(29) After the time t, the car was in the garage.

We can observe that while the sentence 'John washed the car in the garage' doesn't entail (28) and (29), the sentence 'John parked the car in the garage' does have the same pattern of entailments as (27). It has been pointed out by many transformational grammarians that sentences like (27) can best be understood as involving event causation, in which the occurrence of one event results in the occurrence of another event. The sentence 'John parked the car in the garage' can therefore also be analyzed in terms of event causation. Thus, it can be represented as

\[ \text{John parked the car} \rightarrow \text{become} \rightarrow \text{the car was in the garage} \]

The causative analysis is further supported by the fact that the sentence 'John parked the car in the garage' also exhibits scope ambiguity involving adverbs such as again and for three hours. Thus, the two readings in (31) are parallel to those in (32).

(31) John parked the car in the garage for three hours.
(32) John opened the door for three hours.
Sentence (15) can now be analyzed as:

(33)

Our analysis of (15) is parallel to the commonly accepted causative analysis of the verb 'to kill'.

Thus, the verb 'to keep' in (15) is treated as a causative transitive verb which has the meaning of 'to cause something to continue in a given place or state'. (15) is therefore related to (35).

(35) John kept the light burning.

For the purpose of illustration, we can represent (16) as:

(36)
On Davidson-Harman's event analysis, (33) can be translated into the logical form (37), and (36) into (38). In other words, while (15) has the logical form (37), (16) has the logical form (38).

(37) (∃e) (∃e') ((cause) ee' & ((do) John) e ∨ Pe & ((the car be located in the garage)e' & Pe'))

(38) (∃e) ((wash) John)e & Pe & (e be located in the garage)

We have earlier pointed out that while an inner locative X necessarily entails the recipient of an action is located in X, an outer locative Y doesn't necessarily entail either the actor or the recipient is located in Y. The logical forms (37) and (38) precisely express this fundamental difference between inner and outer locatives.

IV. Conclusion

To sum up, the analysis of place adverbials which we have advanced in line with Davidson's event theory include (37) and (38) and a set of axioms of the form (5). It seems that axioms like (5) are also needed for the entailment of the location of an agent in event causations.

There are two residual problems deserving further investigation. First, consider the contrast between (39) and (40).

(39) John slept in bed. (outer locative ?)
(40) John slept on the bed. (inner locative ?)

It appears that while the place adverbials in (39) denote the location of the event 'John slept', in (40) it denotes John's location. It would be nice, if the contrast in question parallels to the contrast between (41) and (42).

(41) John jumped in bed. (outer locative)
(42) John jumped onto the bed. (inner locative)

However, while (42) qualifies for the causative analysis, (40) doesn't. For John must be on the bed first before he can sleep on the bed. The only solution to account for the meaning difference between (39) and (40) that I can think of at this point is to represent (39) and (40) respectively as (43) and (44).

(43) (∃e) ((John sleep) e & Pe & (e be located on the bed))
(44) (∃e) ((John sleep) e & Pe & (John be located on the bed) e)

The second problem comes from sentences like...
(45) John woke up in Mary's bed. (inner locative?)

We can intuitively feel that the place adverbial in Mary's bed denotes John's location when he woke up rather than the location where he performed the action of waking up. Thus, as in (40), the place adverbial in (45) seems to have a function similar to that of inner locatives. Yet, (40) and (45) obviously have different logical forms. For while (45) can be paraphrased as (46), (40) cannot be paraphrased in the same way.

(46) At the time John woke up, he was in Mary's bed.

Finally, it should be noted that in European languages such as German, Russian and Latin, the case distinction between locative (or ablative in Latin) and accusative is made in terms of non-motion versus motion verbs rather than in recognition of the distinction between outer and inner locatives. This is similar to the distinction between in and onto or into in English. Thus, while the difference in logical form between (15) and (16) has syntactic manifestations in Chinese, Japanese and Kapampangan, it doesn't have in the European languages which I have so far investigated.

NOTES

1. In essence, in Quine system, ontological commitment through the use of a proper name is reduced to that through the use of a variable. See Quine (1970) for a detailed discussion. I am grateful to David Clarke for bringing my attention to this important criterion of Quine's.

2. Fillmore (1968) suggested that while the outer locative can be treated as a constituent of modality, the inner locative can be treated as a constituent of proposition. In his later version of case grammar (1971), while he suggested that the locative can be treated as (continued) underlying predicate of an event, he didn't discuss the distinction between the two locatives. Fillmore's treatment of the distinction, though not incorrect, obviously lacks explanatory value.
3. For example, see Kuno (1973) PP96–101.
4. See Mirikitani (1972) PP26–34.

REFERENCES


Hall (Partee), Barbara. 1965. Subject and Object in English. MIT dissertation.


