

down'. Perhaps instead the eye is 'looking down on an inferior'. Finally, T.B. **gip* 'ten' (Benedict 1972:19) relates to 十 686a *đjap* 'ten' (Li: *djap*) where an *s*-cluster need not be postulated.

A fuller discussion of the many cases of possible cognates where Tibetan has *s*-clustering with *-l*, *-r*, and nasals, which are only briefly mentioned in this paper, would necessitate a lengthy treatment. Such a study would also have to include examples of cases where velars and palatals both occur in O.C. phonetic series and word families.

It is hoped that this study has strengthened the case for the existence in Old Chinese of clusters of type **sp*-, **st*-, and **sk*-, but it is obvious that much work still remains to be done.

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A DERIVATIONAL CONSTRAINT ON ADVERBIAL PLACEMENT IN MANDARIN CHINESE

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A general derivational constraint on the placement of predicates is proposed to account for the surface distribution of Chinese adverbials, negatives, and auxiliaries which can be appropriately derived from underlying predicates. It is observed that in Chinese, a preverbal adverbial is always understood as having the main verb in its scope, while a postverbal adverbial is never understood in this way. It will be shown that the proposed constraint and an independently motivated assumption of universal characterization of the semantic scope relation can excellently explain the facts of linear order of multiple adverbials and their corresponding semantic interpretations in Chinese. By assuming that the proposed constraint holds for Chinese, but not for English, it is possible to account for the differences between Chinese and English with respect to the placement of adverbials and other surface constituents which can be derived from underlying predicates.¹

1. **INTRODUCTION.** Although logicians have presented different approaches to the formal representation of adverbials in predicate calculus, they seem to agree that the semantic function of an adverbial is to map properties of predicates into new properties.² Semantically, we can therefore identify any grammatical constituent in a given language which satisfies this definition as an adverbial. Syntactically, it is however the case that adverbials may vary from language to language in their surface syntactic properties. Even within the same language, adverbials of different kinds often exhibit different syntactic patterns. It not infrequently happens that when linguists try to analyze the structure of a particular language, they cannot agree with each other on treating certain types of constituents as adverbials. The task of identifying adverbials in a particular language can be made easier, if we identify adverbials in terms of some semantic functions of cross-linguistic validity rather than on the basis of their language-specific syntactic behaviors.³

Due to the lack of overt adverbial markings, Chinese grammarians have

¹ An abbreviated version of this paper was presented at the Annual Meeting of the Linguistic Society of America, St. Louis, Missouri, December 28, 1971. I am indebted to Gerald A. Sanders for valuable comments on the original manuscript. I have also benefited from comments by Emmon Bach, John Robert Ross, and Benjamin K. T'sou during the meeting. This research was supported in part by a summer research grant from the Graduate School, Southern Illinois University at Carbondale.

² For more discussion concerning this see Reichenbach (1947:301-310), Clark (1970), Parsons (1972), Harman (1972) and others.

³ See Sanders (1972) for an important discussion of semantic and syntactic characteristics of different types of adverbs. For detailed discussion of a number of important semantic functions of adverbials see Shuan-fan Huang (1971).

adopted a strategy which is based on the notion of modification to cope with the problems of identifying adverbials. The term modification in Chinese grammar is typically characterized by Chao (1968) as the following:

'An expression X is said to modify another expression Y when XY is an endocentric construction and Y, but not X, is the center. X is called the attribute or modifier, and Y the head or modified part.' (Chao 1968: 274)

Chinese adverbials are then defined as those constituents which are in the modification construction with verbs, adjectives, and other adverbials. It is significant to note that Chao has not defined the term modification in the same way as logicians have normally defined it.⁴ The linear order plays a rather important role in his definition. By his definition, a constituent which has the function of an adverbial will not be considered as an adverbial, if it doesn't precede the governing head or center. Thus, adverbials are considered as adverbials, only if they precede governing heads. If they follow governing heads, they are treated as complements. This distinction by Chao is particularly clear in the cases where adverbials are in construction with the main predicate.

There is nothing wrong with this distinction. What has gone wrong is that many Chinese grammarians have taken this distinction as 'given' rather than something to be 'explained'. It seems clear that the so-called verbal complements have the same semantic function as adverbials in mapping the property expressed by the main predicate onto a new property. This is further evidenced by the fact that the equivalents of many of these Chinese verbal complements are adverbials in English. Questions should then be raised as to why adverbial placement in Chinese has this particular feature. Why is it that while some adverbials are placed before the main verb, some other adverbials are placed after? What kinds of adverbials are placed before the main verb? What kinds are placed after?

In terms of surface distribution, adverbials in Chinese can be categorized into three classes: adverbials which can only occur before the main verb, adverbials which can only occur after the main verb, namely the so-called verbal complements, and adverbials which can occur either before or after yet with different functions. The purpose of this paper is to propose a theory which will account for the placement of adverbials in Chinese. The proposed theory consists essentially of the assumption that most adverbials are derived from underlying predicates and a general constraint on the placement of Chinese adverbials which is shown to be valid for the placement of Chinese predicates in general. It will be shown that the systematic differences between Chinese and English in their respective patterns of adverbial place-

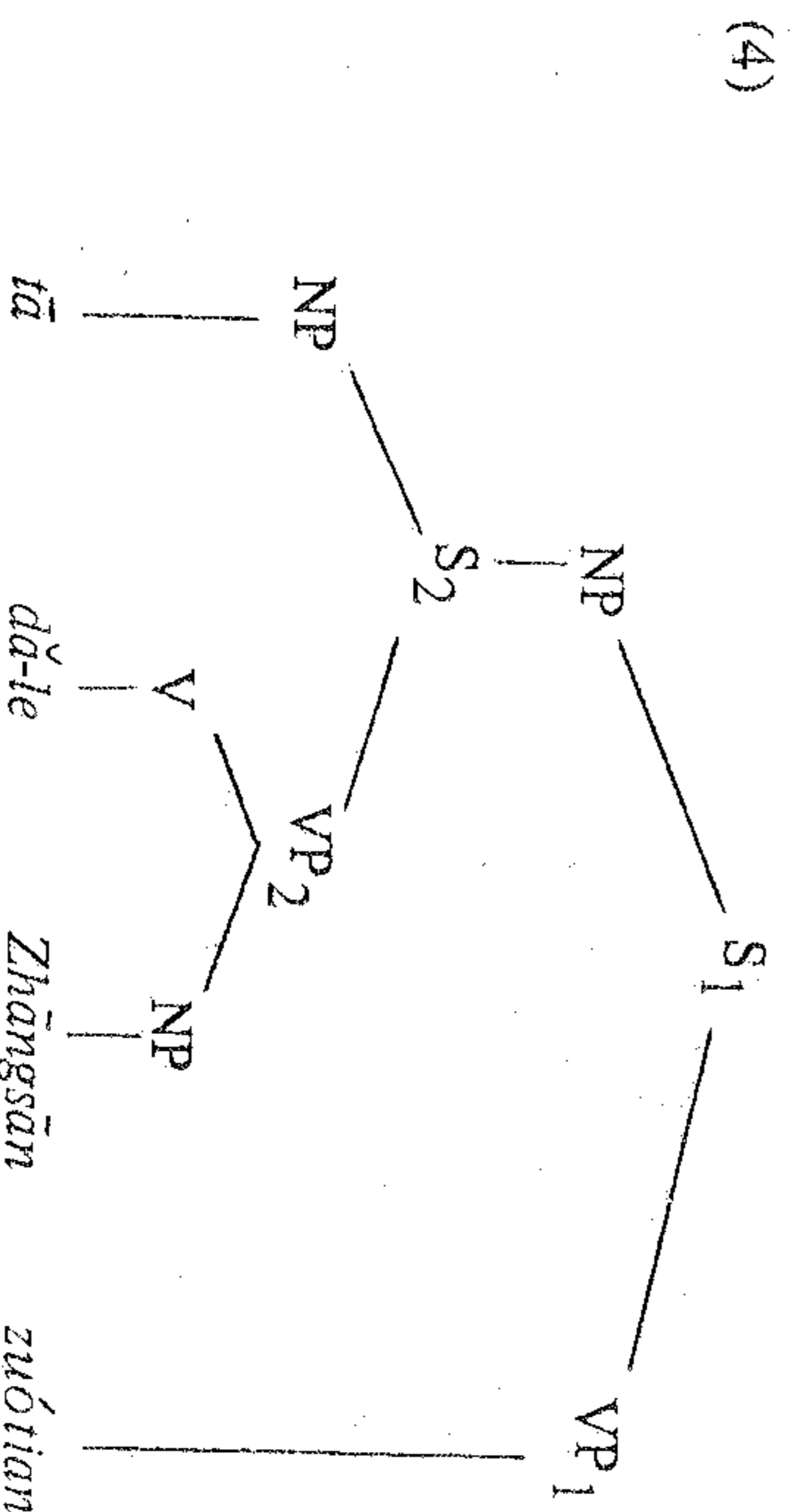
⁴ Generally speaking, logicians have considered the process of modification as the mapping of a property into new property.

ment can be explained by assuming that this constraint holds for Chinese, but not for English.

2. ADVERBIAL PLACEMENT. In Chinese, time adverbs, locative adverbial phrases, and modal adverbs can occur before the main verb, but not after.⁵ This is illustrated in examples (1)-(3).

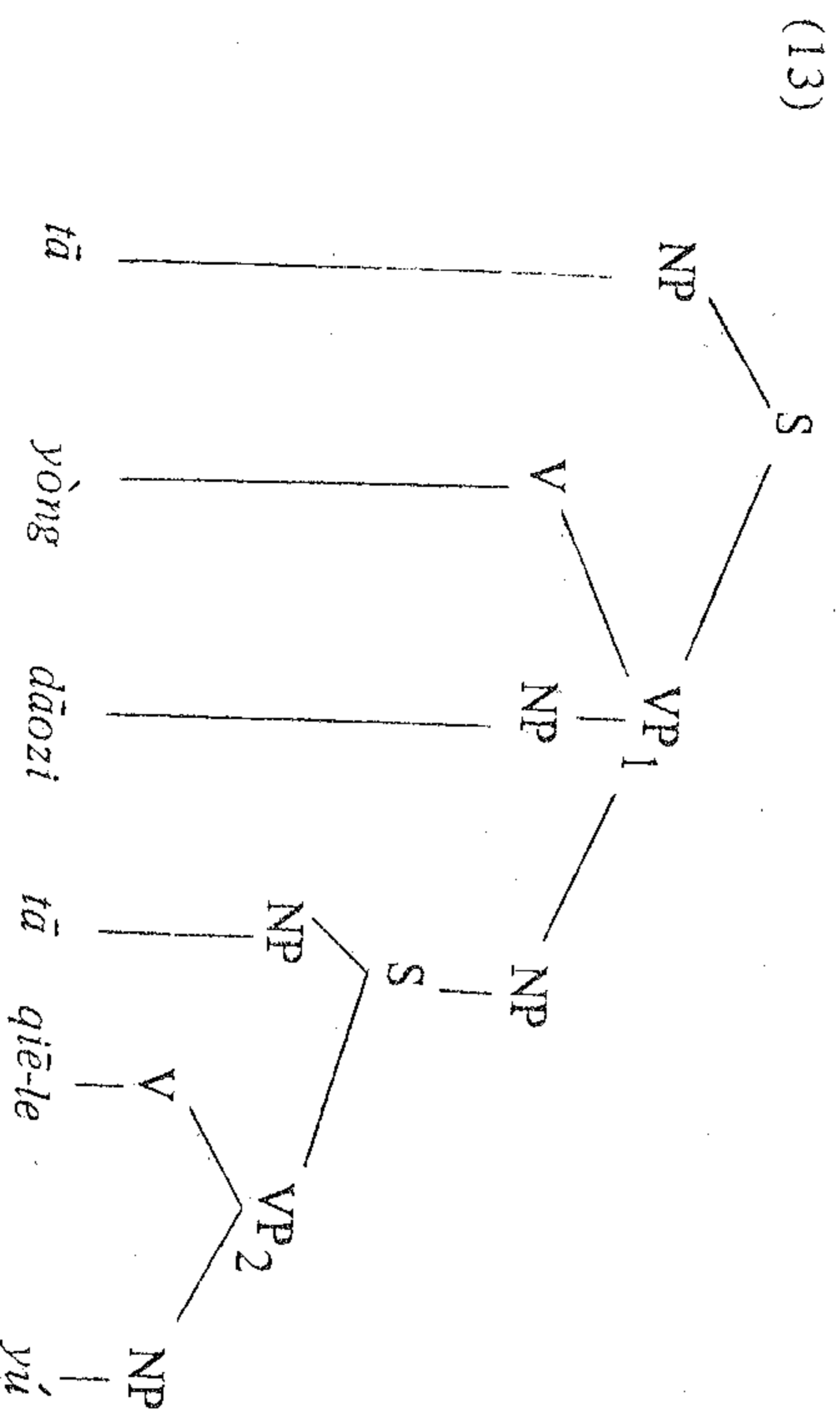
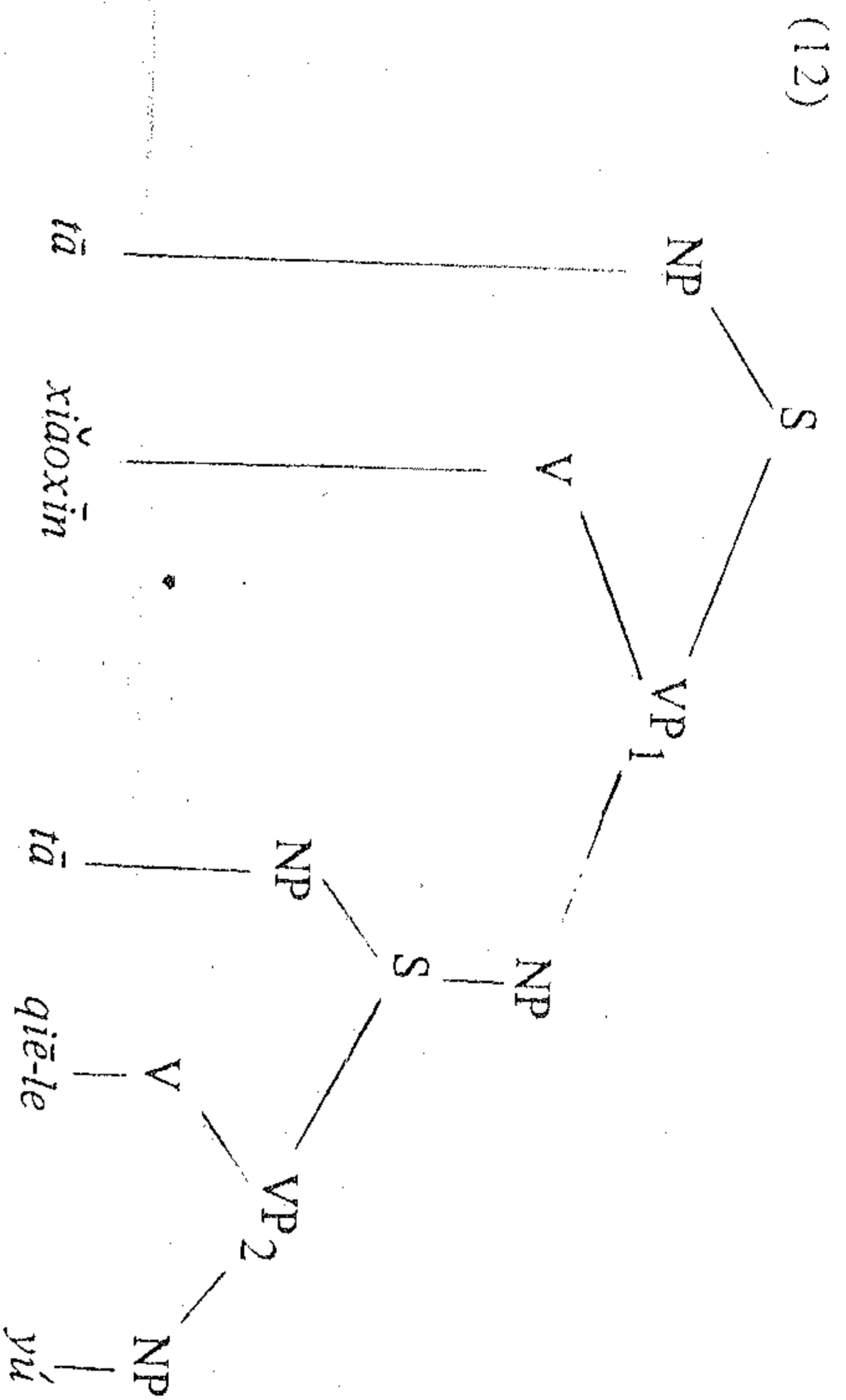
- (1) a. *tā zuótiān dǎ-le Zhāngsān*
(he) (yesterday) (hit-asp) (John)
He hit John yesterday.
b. *zuótiān tā dǎ-le Zhāngsān*
c. * *tā dǎ-le zuótiān Zhāngsān*
d. * *tā dǎ-le Zhāngsān zuótiān*
- (2) a. *tā zài xuéxiào-li dǎ-le Zhāngsān*
He hit John in the school.
b. *zài xuéxiào-li tā dǎ-le Zhāngsān*
c. * *tā dǎ-le zài xuéxiào-li Zhāngsān*
d. * *tā dǎ-le Zhāngsān zài xuéxiào-li*
- (3) a. *tā kěnéng dǎ-le Zhāngsān*
He hit John, possibly.
b. *kěnéng tā dǎ-le Zhāngsān*
c. * *tā dǎ-le kěnéng Zhāngsān*
d. * *tā dǎ-le Zhāngsān kěnéng*

On the evidence of English syntax, Lakoff (1965, 1970), Schreiber (1968) and others have argued that these adverbials are underlying higher predicates which take abstract sentential subjects. If we assume that these adverbials in Chinese are also derived from the same type of higher predicates, the underlying structures of (1), (2), and (3) can be represented as (4), (5), and (6) respectively.



⁵ Locative adverbial phrases can also occur after the main verb. However, preverbal locative adverbials and postverbal locative adverbials have different semantic functions. This is to be illustrated and discussed in sentence (18).

If we follow Lakoff's suggestions for the treatment of adverbials like *carefully* and *with a knife*, we can consider (12) and (13) as underlying representations for (10) and (11) respectively.



With (12) and (13) representations, it is not difficult to see that the PPC also serves to block ungrammatical sentences like (10)b and (11)b.⁹

For purposes of discussion, we will refer to the class of Chinese adverbials

(50)' When one cuts fish, one uses a knife.

(51)' When Chinese eat meals, they use chopsticks.

That (50) and (51) involve a structure different from that of (11a) can further be evidenced by the ungrammaticlicity of (52) and (53).

(52) * *qiē-le yú yòng dāozi*

(53) * *Zhōngguó rén chī-le fàn yòng kuàizi*

⁹In (12) and (13) tree structures, VP₂ is included in VP₁. In order for PPC to apply to place VP₁ before VP₂ in surface structure, we have to consider the main verb and the object (if any) immediately dominated by VP₁ as the actual VP₁ which PPC will refer to.

which can only occur before the main verb as preverbal adverbials and to the class of Chinese adverbials which can only occur after the main verb as postverbal adverbials. Roughly speaking, the class of preverbal adverbials consists of time adverbs (as in (1)), locative adverbial phrases (as in (2)), modal adverbs (as in (3)), manner adverbs (as in (10)), and instrumental adverbs (as in (11)).

From the examples given above, it can be seen that in English, however, the equivalents of Chinese preverbal adverbials can occur after the verb. This systematic difference between Chinese and English can be explained by means of the proposed PPC, if we assume that both Chinese and English have the same underlying representations for these preverbal adverbials, and that while Chinese observes the PPC, English doesn't.

The class of postverbal adverbials consists of resultative adverbials, adverbs of duration, adverbs of frequency, and descriptive adverbs.¹⁰ They are illustrated in (14)-(17) sentences respectively.

(14) a. *tā pīn-dùì-le zhèige zì*

(he) (spell-correct-asp) (this) (word)

He spelled this word correctly.

b. * *tā duì-pīn-le zhèige zì*

c. * *duì tā pīn-le zhèige zì*

(15) a. *tā shuì-le sān tiān*

(he) (sleep-asp) (three) (day)

He has slept for three days.

b. * *tā sān tiān shuì-le*

c. * *sān tiān tā shuì-le*

(16) a. *tā lái-le sān cì*

(he) (come-asp) (three) (time)

He has come three times.

b. * *tā sān cì lái-le*

c. * *sān cì tā lái-le*

(17) a. *lǎohu pǎo de kuài*

(tiger) (run) (de-marker) (fast)

The tiger runs fast.

b. * *lǎohu kuài de pǎo*

c. * *kuài lǎohu pǎo*

Although the sources for these postverbal adverbials cannot be well deter-

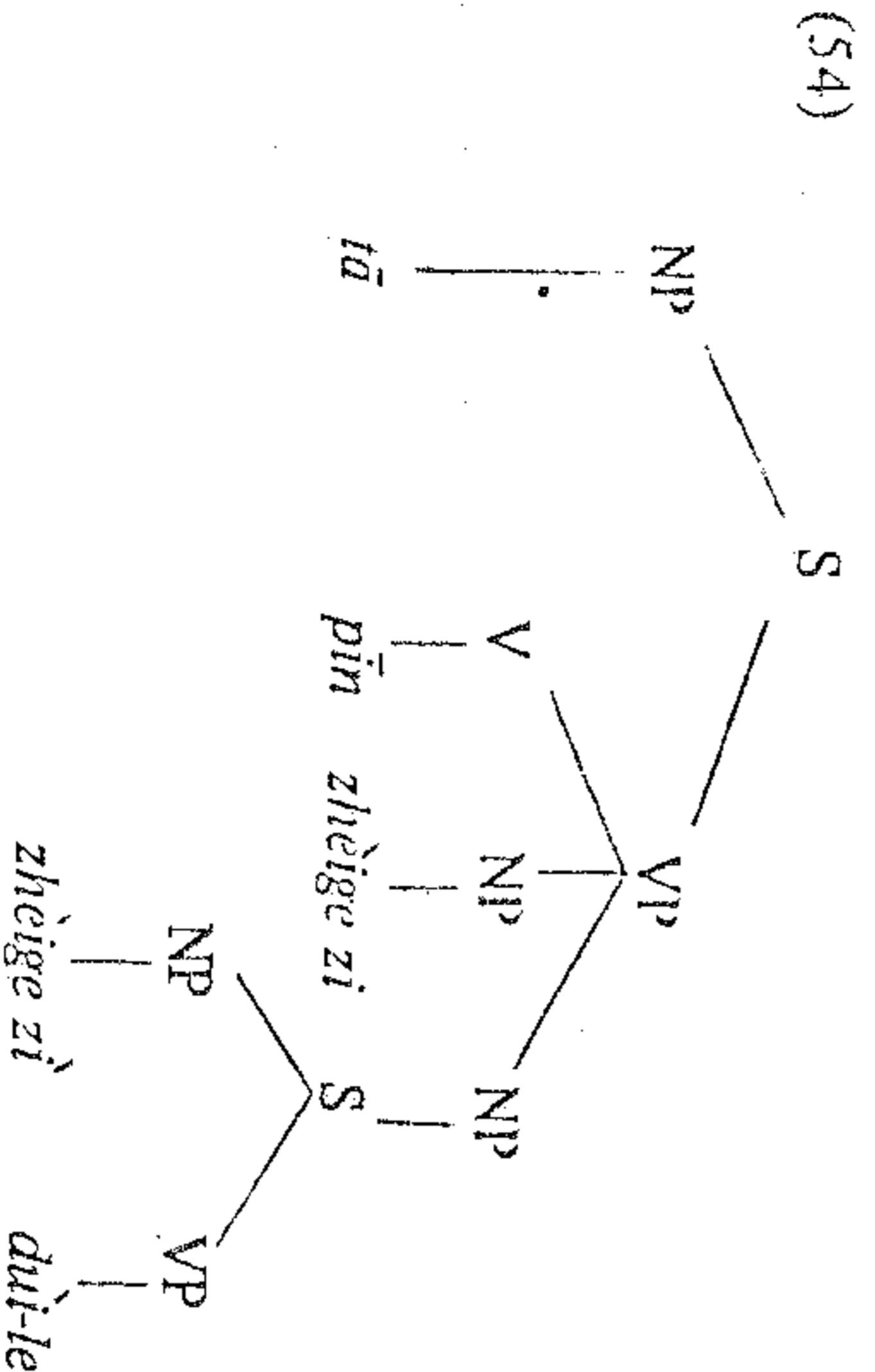
¹⁰Adverbs such as *kuài* 'fast' in (17a) have often been labelled as manner adverbs. In this paper, I have restricted the term **manner adverb** to those adverbs which express the state of mind of the participant of an action, and called those which help to describe the property of the action indicated by the verb **descriptive adverbs**. Thus, while *carefully* in (10a) is a manner adverb, *fast* in (17a) is a descriptive adverb.

mined,¹¹ the observation can be made that while a preverbal adverbial in Chinese expresses a qualification or restriction on the occurrence of an event (as in (1)-(3)) or the circumstance or manner in which the actor performs the action (as in (10)-(11)), a postverbal adverbial expresses the result of an action (as in (14)), the extent to which an action has performed (as in (15) and (16)) or a further characterization of the action indicated by the verb (as in (17)).¹² Thus, the function of preverbal adverbials is clearly different from that of postverbal adverbials. For purposes of discussion, it seems proper that we refer to preverbal adverbials as having a function of *modifying* the main verb, and to a postverbal adverbial as having a *non-modification* function on the main verb.

This observation can be further confirmed by the fact that in Chinese, whenever an adverbial can occur both before and after the main verb, there is always a contrast of meaning, and this contrast can always be described in terms of a distinction between *modification* and *non-modification* of the predication expressed by the main verb. It can be seen from the contrast between each pair of sentences (18)-(20).

- (18) a. *tā bǎ zì xiě zài zhuōzi-shàng*
(he) (Obj. marker) (character) (write) (at) (table) (on)
He wrote characters on the surface of the table.

¹¹ Anne Yue Hashimoto (1966) has convincingly shown that resultative adverbials can be derived from predicate of underlying verbal complement sentences. For example, the underlying structure of (14) can be represented as:



The fact that resultative adverbials are ordered after the main verb can be accounted for by the proposed PPC, and the assumption that resultative adverbials are derived from underlying subordinate predicates. If it can be shown that all postverbal adverbials are derived from underlying predicates which are subordinate to the main verb, PPC can also account for the placement of adverbials in (15)-(17) sentences.

¹²The function of descriptive adverbs can be seen more clearly through the analysis of this type of adverbs by logicians. For example, the sentence *x moves slowly* is analyzed by Reichenbach (1947) as *there is a specific motion-property which x has and which is slow*. Thus, in Reichenbach's analysis, *slowly* is a predicate which describes the property of the main verb *move*.

b. *tā zài zhuōzi-shàng bǎ zì xiě-le*
He wrote the characters (on papers) at the table.

(19) a. *tā wánr de hěn gāoxìng*
(he) (play) (de-marker) (very) (happy)
He is very happy from playing.

b. *tā hěn gāoxìng de wánr zhe*
He is playing very happily.

(20) a. *tā zǒu de hěn kuài*
(he) (walks) (de-marker) (very) (fast)
He walks very fast.

b. *tā hěn kuài de zǒu-kuài*
He walked away very fast.

It can be seen from the English translations that while in (18a) *zài zhuōzi shàng* 'on the table' indicates the location of the characters written, in (18b) it indicates the location where the action of writing characters has taken place. Thus, in (18a) the characters are written on the surface of the table, in (18b) the characters can be written on paper or on something else, and not necessarily on the surface of the table. In (19a), *hěn gāoxìng* 'very happy' denotes the result of the action, in (19b) it expresses the state of the mind in which the actor has performed the action. Similarly, while in (20a) *hěn kuài* 'very fast' describes the speed of the action, in (20b) it states the manner in which the actor has performed the action. It should be noted that while in (19b) and (20b) the actor can have the volition on the circumstance or the manner in which he has performed the action, in (19a) and (20a) the actor himself cannot determine the result or the extent of the action. Thus, while in (19b) the actor can choose to perform the action in a happy mood, in (19a) the actor feels happy either after he has started or after he has finished performing the action. Similarly, in (20b) the actor can be a person who walks slow yet who chose to walk as fast as he could manage in this particular incident. In (20a), however, the actor cannot be a slow walker, and it is implied that he is able to walk very fast, and that he habitually walks very fast.

Based on the observation that a preverbal adverbial has the function of *modification*, which is not observed in the case of postverbal adverbials, we seem to be justified in claiming that in Chinese a preverbal adverbial is always understood as having the main verb in its scope, while a postverbal adverbial is never understood in this way. In the present analysis, the fact that a preverbal adverbial cannot occur after the main verb is automatically explained by the proposed PPC, and the independently motivated assumption that semantic scope is universally characterized by the asymmetrical command relation in the underlying structure.

3. **ADVERBIAL SCOPE.** If the assumed characterization of adverbial scope and the proposed ordering constraint are both valid, it would then be expected that when there is more than one preverbal adverbial in a Chinese sentence, the

linear order of these adverbials reflects their relative heights in the underlying structure. This expectation is, in fact, correct. Thus, in Chinese, if adverbial X is semantically in the scope of adverbial Y, then X is always ordered after Y. For example, in (21) *yǒushíhòu* 'sometimes' is always ordered after *qùnián* 'last year'.

- (21) a. *wǒ qùnián yǒushíhòu kànjian tā*
 (I) (last year) (sometimes) (see) (him)
 I saw him sometimes last year.
 b. * *wǒ yǒushíhòu qùnián kànjian tā*
 (I) (at) (U.S.A.) (very) (many) (place) (live-asp)
 I have lived in many places in U.S.A.
 b. * *wǒ hén duō dìfāng zài měiguó zhù-guò*

The impossibility of ordering 'sometimes' before 'last year' is due to the non-existence of an underlying structure in which 'sometimes' is a higher predicate for the sentence 'I saw him last year'. This deep structure constraint is consistent with the fact that 'last year' has a wider scope than 'sometimes' in every possible semantic interpretation. (22) represents a parallel situation in the case of space.

Our expectation is also verified by the fact that whenever both X-Y and Y-X orders are possible for a pair of Chinese adverbials, there is either a contrast of meaning related to differences in scope, or there is no sentence in which either of these two adverbs can be understood to be in the scope of the other. Thus, (23a) asserts 'yesterday' with respect to the act of my hitting him and can be paraphrased as 'it was yesterday that I hit him intentionally', while (23b) asserts 'intentionally' with respect to the act which took place yesterday and can be paraphrased as 'my act of hitting him yesterday was done intentionally'.

- (23) a. *wǒ zuótiān gùyì dǎ-le tā*
 (I) (yesterday) (intentional) (hit-asp) (him)
 It was yesterday that I intentionally hit him.
 b. *wǒ gùyì zuótiān dǎ-le tā*

My act of hitting him yesterday was done intentionally.

The contrast between (23a) and (23b) can also be seen by the fact that while (23a) can serve as an answer to the question (24), (23b) cannot.

- (24) a. *nǐ shénmo shíhòu gùyì dǎ-le tā*
 (You) (what) (time) (intentionally) (hit-asp) (him)
 (he) (at) (kitchen) (inside) (use) (knife) (cut) (fish)
 He is cutting fish in the kitchen with a knife.
 b. *tā yòng dāozi zài chūfáng-li qiē yú* (= 25a)

(25a) and (25b) can serve as an example of cases in which both X-Y and Y-X orders are possible, yet in which there is no contrast of meaning related to any differences in adverbial scope. The ordering relation of the pair of

adverbials in (25) is not incompatible with the present treatment, since the semantic relation between 'in the kitchen' and 'with a knife' with respect to the main verb seems clearly of a coordinate nature. It is a well-known fact that the conjuncts of a genuine coordinate structure can always have free ordering.

If my arguments so far are correct, an interesting question should be raised concerning the fact that in Chinese, time adverbials always have to be ordered before locative and instrumental adverbials.¹³ It is illustrated by (26) and (27).

- (26) a. *tā zuótiān zài chūfáng-li qiē-le yú*
 (he) (yesterday) (at) (kitchen) (inside) (cut-asp) (fish)
 He cut fish yesterday in the kitchen.
 b. * *tā zài chūfáng-li zuótiān qiē-le yú*
 (27) a. *tā zuótiān yòng dāozi qiē-le yú*
 (he) (yesterday) (with) (knife) (cut-asp) (fish)
 He cut fish with a knife yesterday.
 b. * *tā yòng dāozi zuótiān qiē-le yú*

It is not obvious that locative and instrumental adverbials should be within the scope of the time adverbials when they are referring to an action identified by the same verb. I do not know of any significant syntactic evidence which can support the claim that time adverbials should always be represented as predicates higher than locative and instrumental adverbials in the underlying structure. Such evidence should exist, however, if the proposed ordering principle for Chinese adverbials is correct.

I have shown that PPC can explain the ordering relations among those Chinese adverbials which have the function of defining scope for the main verb. From the above discussion, it should be clear that PPC also explains the differences between English and Chinese with respect to the ordering among adverbials themselves. Although Lakoff (1971) has given some English examples which are parallel to our Chinese example represented in (23), it is not the case that the placement of multiple adverbials in English also observes PPC.¹⁴ This can be seen from the English translation sentences in (21) and

¹³ Related to this is the fact that to many native speakers of Mandarin Chinese, sentences involving the preposing of locative or instrumental adverbs to the initial position are not as normal as sentences with time adverbials preposed to the initial position. In fact, these three types of adverbials form a scale of grammaticality in regard to the preposing to the sentence initial position. The order of ranking is (1) time, (2) locative, and (3) instrumental. Thus, for example, (2b) is not as colloquial as (1b), and the sentence *yòng dāozi wǒ qiē-le yú* (with a knife I cut fish) is not normal as (2b).

Perhaps, also related is the fact that while sentences such as *tā zài chūfáng-li* (he is in the kitchen) and *tā yòng dāozi* (he uses a knife) are grammatical, the sentence *tā zuótiān* (he yesterday) is ungrammatical.

¹⁴ For example, the contrast between (55a) and (55b).

(55) a. John evidently had *carefully* sliced the bagel *quickly*.
 b. John evidently had *quickly* sliced the bagel *carefully*.

(22). In fact, there are many cases in English which represent exactly the reverse situation of (23) in Chinese.

- (28) a. I beat my wife in public often.
b. I beat my wife often in public.

(28) can serve as an example for discussion.¹⁵ In (28a), 'often' is higher than 'in public' in the underlying structure, yet 'often' is ordered after 'in public'. In (28b), 'in public' is higher than 'often', yet again, the higher one is ordered after the lower one. The Chinese sentence corresponding to (28), however, shows that contrast between (28a) and (28b) in Chinese is predictable in terms of PPC.

- (29) a. *wǒ cháng zài dàzhòng miànqián dǎ wǒ qīzi*
(I) (often) (at) (public) (before) (hit) (my) (wife) (= 28a)
b. *wǒ zài dàzhòng miànqián cháng dǎ wǒ qīzi*
(= 28b)

It is not my concern at present to determine what principles govern the placement of adverbials in English. As far as the systematic differences between Chinese and English in adverbial placement are concerned, however, it seems sufficient to assume that Chinese observes PPC, while English does not.

4. PREDICATE PLACEMENT. The assumption that PPC holds for Chinese, but not for English can also explain the systematic differences between these two languages in the placement of other constituents which can be appropriately derived from underlying higher predicates. Thus, consider the placement of negatives in Chinese.

- (30) a. *tā méi yǒu qián*
(he) (not) (have) (money)
He has no money.
b. * *tā yǒu méi qián*
(31) a. *tā méi dǎ rén*
(he) (not) (hit) (person)
He didn't hit anyone.
b. * *tā dǎ méi rén*
(32) *méi rén dǎ wǒ*
(not) (person) (hit) (I)
Nobody hit me.

(30) illustrates the fact that the negative cannot occur after the main verb. (31) and (32) show that although there is a rule of Negative Incorporation in Chinese, the negative is not allowed to be attached to an NP after the main verb.¹⁶ The ungrammaticality of sentences like (30b) and (31b) can be explained by the proposed constraint and the assumption that in both English and Chinese, the negative in (30) and (31) originates from the main verb of the higher sentence.

¹⁵I have borrowed this example from Lakoff (1965).

¹⁶For a detailed discussion of the rule of Negative Incorporation see Klima (1964) and Robin Lakoff (1969b).

The proposed PPC also explains the fact that in Chinese, the negative cannot be raised out from complement sentences and placed before the main verb. Thus, while there is a rule of Negative Transportation in English, there is none in Chinese.¹⁷ This can be exemplified by (33).

- (33) a. *wǒ xiǎng Zhāngsān fēidào míngtiān bú huì lái*
(I) (think) (John) (until) (tomorrow) (not) (will) (come)
I think John won't come until tomorrow.
b. * *wǒ bú xiǎng Zhāngsān fēidào míngtiān huì lái*
I don't think that John will come until tomorrow.

The explanatory value of the proposed PPC can be further seen from the fact that while in English a lower predicate can be raised and placed in front of the higher predicate, in Chinese this can never happen. Thus, while one can derive (34b) from (34a) in English, the Chinese correspondent of (34b) is ungrammatical.¹⁸ This is shown in (35).

- (34) a. It seems that John can't finish this job.
b. John can't seem to finish this job.
(35) a. *Zhāngsān hǎoxiàng bìnéng zuòwán zhèjiàn shìqìng*
(John) (seem) (can't) (finish) (this) (job) (= 34a)
b. * *Zhāngsān bìnéng hǎoxiàng zuòwán zhèjiàn shìqìng*
(= 34b)
Similarly, the contrast between English and Chinese in sentences like (36) and (37) is again predictable in terms of PPC.
(36) a. It is not the case that he may go. (permission)
b. He may not go.
(37) a. *tā bù kěyǐ qù*
(he) (not) (may) (go) (= 36a)
b. * *tā kěyǐ bù qù*¹⁹
(= 36b)

In Chinese, it is not only the lower predicate itself which cannot be placed before the higher predicate, but also any constituents which include the lower predicate. This is illustrated by examples (38)-(43).

- (38) a. This thing is possible.
b. *zhèjiàn shìqìng kěnéng*
(this) (affair) (possible)
(39) a. That he has cheated John is possible.
b. * *tā piàn-le Zhāngsān kěnéng*²⁰

¹⁷For a detailed discussion of Negative Transportation rule see Robin Lakoff (1969a).

¹⁸According to Langendoen (1970), (34b) is derived from (34a) through a *can't raising* transformation.

¹⁹With the interpretation *he is permitted not to go*, (37b) is grammatical. The contrast in meaning between (37a) and (37b) as a grammatical sentence further confirms the validity of PPC in the placement of auxiliaries.

²⁰Some of our informants can tolerate (39b). A careful examination reveals that those informants have mixed (39b) with (56).

(56) *tā piàn-le Zhāngsān de zhèjiàn shìqìng (yǒu) kěnéng*

