WǑ PǍO DE KUÀI AND CHINESE PHRASE STRUCTURE

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This paper juxtaposes two well-known competing hypotheses about the structure of resultative and descriptive sentences in Chinese. According to the P[rimary] P[redication] hypothesis, the second verb in a ...V1...V2... sequence is treated as the main verb of the sentence; according to the S[econdary] P[redication] hypothesis, the second verb is treated as a complement to the first. Three major arguments for PP are reviewed and shown not to be cogent, and an alternative analysis is proposed for each of the issues raised: the distribution of A-not-A questions, negation, aspect marking, and the properties of certain complex causative constructions. The otherwise peculiar distribution of the negative and A-not-A morphemes turns out to follow from a principle requiring them to be lexically realized in INFL, and a D-Structure analysis of complex causative sentences consistent with the SP hypothesis explains the related facts in a desirable way. Additional arguments for SP are presented which turn on certain facts of anaphora, verb reduplication, scope of negation, and tone sandhi.*

INTRODUCTION

1. A familiar topic in Mandarin Chinese syntax has to do with the proper phrase structure analysis of sentences like 1 and 2:

(1) *wǒ pǎo de hěn kuài.*
I run DE very fast
'I run very fast.'

(2) *tāmen tiào de hěn lèi.*
they jump DE very tired
'They jumped till they got very tired.'

Each of these sentences has two predicates, which I will henceforth refer to as V1 and V2. In 1, V1 is the action verb *pǎo* 'run' and V2 is the adjective or stative verb *kuài* 'fast'. In 2, V1 is *tiào* 'jump' and V2 is *lèi* 'tired'. Sentences like 1 are traditionally referred to as DESCRIPTIVE COMPLEMENT CONSTRUCTIONS, and those like 2 as RESULTATIVE COMPLEMENT CONSTRUCTIONS. The resultative, but not the descriptive, construction may also take the form of 3, in which the second verb has its own subject appearing before it:

(3) *tāmen kū de shǒupà dōu shī le.*
they cry DE handkerchief also wet ASP
'They cried so much that even the handkerchief got wet.'

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All of these sentences contain the particle *dé*, which has been historically derived from the verb *dé* 'obtain'. Phonologically, *de* is attached to the preceding verb, either as a suffix or a clitic, depending on one's theory. The syntactic status of *de* is itself a controversial matter. I will gloss it simply as DE.

The well-known problem which I will discuss in this article is the structural relationship between V1 and V2, in particular the question of which of the two verbs in each sentence is the main verb. This question does not arise if one considers only the English translations given above, in each of which the first verb is clearly the main verb, and the second is embedded in a subordinate clause or appears in an adverbial position. However, sentences 1–3 might just as well have been translated as 'I am fast in running', 'They got very tired from jumping', and 'The handkerchief got wet as a result of their crying', respectively, where the verb corresponding to V2 is treated as the main predicate. The question does not arise in English because there are clear clues, based for example on the finiteness of a verb, the presence or absence of the verb *to be*, and of a complementizer like *until* or *so that*, to tell us which is the main verb. In Chinese, however, none of these clues exist, since finiteness is not marked, a stative verb need not be introduced by a copula, and the status of the particle *de* is itself at issue.

There are two competing approaches to this question in the literature. Borrowing the terminological distinction from Rothstein 1983, I shall refer to these two approaches as the Primary Predication hypothesis and the Secondary Predication hypothesis, according to whether V2 is treated as the main verb (primary predicate), or as a subordinate verb (secondary predicate).

According to the P[rimary] P[redication] hypothesis, the second verb in 1 is treated as the main verb, and what precedes it is treated as a sentential subject or a subject followed by an adverbial adjunct containing the first verb, as indicated in Figures 1a and 1b. For a sentence like 3, this hypothesis would treat the second clause as the main clause and the first one as an adverbial clause, as indicated in Fig. 1c. This hypothesis was first proposed by Chao 1948, 1968 and Dragunov 1952, and has been followed or argued for in such works as Tai 1973, Tang 1977, Li & Thompson 1978, 1981, and C.-R. Huang & Mangione 1985, although these authors may differ non-trivially in their analyses of specific constructions.[1]

According to the S[econdary] P[redication] hypothesis, V2 in each of 1–3 is dominated by a maximal AP or S′ which occurs as an adjunct, or secondary predicate, either under V″ (as in Fig. 2a) or directly under the matrix S (as in

[1] For example, Chao's original proposal (1968) was intended only for descriptive constructions like 1, not for resultatives like 2–3. However, since the argument he produced was naturally extendable to make the same point for resultative constructions, it is not surprising that others subscribing to this hypothesis have adopted it for all of 1–3. Furthermore, for certain writers the distinction between 1 and 2–3 is purely one of descriptive convenience, but has no theoretical status. Li & Thompson 1981, for example, regard all of these as instances of what they call the 'complex stative construction'. Under this view, both the descriptive and the resultative constructions should have the same structural analysis, their difference being inferred under appropriate pragmatic conditions.

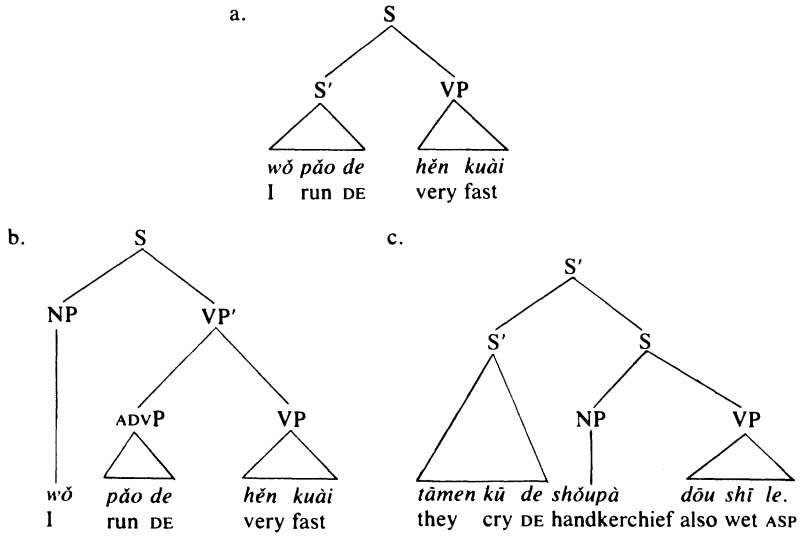

FIGURE 1. The Primary Predication hypothesis

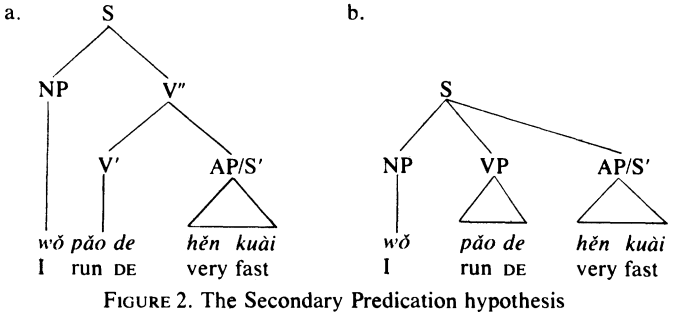

FIGURE 2. The Secondary Predication hypothesis

Fig. 2b).[2] This hypothesis is the one more familiar from tradition, and is argued for or assumed in Mei 1972, 1978, Paris 1979, Zhu 1982, Huang 1982, Ross 1984, and Li 1985, among others.

The two hypotheses represented by Figs. 1 and 2 have the following consequence for the analysis of the particle *de*. According to the structures in Fig. 1, *de* is necessarily construed with what precedes it. On Chao's 1968 analysis, the particle in Fig. 1a is simply the same element as the *de* found in NP modification, which separates a relative clause, for example, from its head, as in

[2] This usage of the term 'secondary predication' differs somewhat from Rothstein's (1983) with respect to the V2 in the resultative constructions, especially that in 3. According to Rothstein, a secondary predicate is one that is related to some subject which does NOT form a syntactic constituent with it. In 3, V2 is a primary predicate of the subject 'handkerchief' in the same sense that *arrived* is the primary predicate of *John* in *John arrived*. To maintain the term in the same usage, we might talk about the entire resultative clause containing V2 as a complex predicate, and this complex predicate would then be the secondary predicate of the entire sentence.

tāmen mǎi de shū 'the book that they bought' (lit. 'they buy DE book'). A variant of the hypothesis represented by Fig. 1a might take *de* to be a clausal COMP of S'. According to Figs. 2a and 2b, on the other hand, *de* may be considered a COMP of the following resultative clause or the marker of the following AP as an adverbial modifier (cf. Ross 1984) which cliticizes to the preceding verb, or it may be considered a suffix of the verb.

In this paper I argue for the SP hypothesis by addressing seriously the facts that have been claimed to support the PP hypothesis. In §2 below, I review the major arguments that have been put forth for the PP hypothesis. In §§3–5 I show that each of these arguments turns out to be a non-argument upon closer examination. Furthermore, although the facts that these arguments turn on present important problems for the SP hypothesis, I show that each of these facts is more naturally explained under a proposed analysis that is consistent with this hypothesis. In the remaining sections I turn to some positive arguments for Secondary Predication, and conclude with a brief summary of the entire argument.

ARGUMENTS FOR PRIMARY PREDICATION

2.1. A-NOT-A QUESTIONS. Three major arguments for Primary Predication are worth considering. The first, and the best known, turns on the distribution of the so-called A-not-A questions (and the negative morpheme *bù*). This argument was first produced by Chao 1968, and has often been reproduced by others attempting to support this hypothesis. An example of an A-not-A question is given in 4:

(4) *Zhāngsān xǐhuān-bù-xǐhuān nǐ?*
Zhangsan like-not-like you
'Does Zhangsan like you or not?'

As shown in 4, an A-not-A question is formed by reduplicating the verb of the sentence and inserting the negative morpheme *bù* between the two identical verbs. Now, consider how an A-not-A question can be formed out of sentences like 1–3. Crucially, note that it is V2 but not V1 that takes the A-not-A form:

(5) a. *tāmen pǎo de kuài-bù-kuài?*
they run DE fast-not-fast
'Do they run fast?'
b. **tāmen pǎo-bù-pǎo de kuài?*
they run-not-run DE fast

(6) a. *nǐ pǎo de lèi-bù-lèi?*
you run DE tired-not-tired
'Are you tired from running?'
b. **nǐ pǎo-bù-pǎo de lèi?*
you run-not-run DE tired

Given typical sentences like 4, where what is clearly the main verb appears in the A-not-A form, one may wonder why the A-not-A form must appear with V2 rather than V1, if V1 is the main verb. But if V2 is the main verb as pre-

scribed by the PP hypothesis, the question disappears, and the behavior of descriptive and resultative constructions with respect to A-not-A questions is exactly as expected. The same argument can be produced with facts concerning the placement of the negative marker *bù*, as shown in negative sentences like the following:

(7) a. *tāmen pǎo de bù kuài.*
they run DE not fast
'They don't run fast.'
b. **tāmen bù pǎo de kuài.*
they not run DE fast

A tacit assumption underlying this argument is, of course, that an A-not-A question is well-formed only if its main verb appears in the A-not-A form.

2.2. *LE*-SUFFIXATION. The second argument for Primary Predication has to do with the distribution of verbal aspects such as the perfective *le* and the durative *zhe*. In the constructions under consideration, only V2 may take such suffixes, but not V1:

(8) a. *tāmen kū de [yǎnlèi liú(-le) chūlái].*
they cry DE tears flow(-PERF) out
'They cried so much that tears came out.'
b. **tāmen kū-le de [yǎnlèi liú(-le) chūlái].*
they cry-PERF DE tears flow(-PERF) out

This is taken to show that V2 is a full-fledged main verb, while V1 is a 'degenerate' embedded verb—degenerate in the sense that it cannot take certain suffixes, like gerunds or infinitives. An argument of this sort appears in Li 1975 and Li & Thompson 1978, and can be found elsewhere as well.

2.3. BINDING CONDITION C. The third argument is due to C.-R. Huang & Mangione 1985, which is based on sentences like the following, first discussed by Lingding Li 1963:

(9) [**e** *zuì de [Zhāngsān zhàn-bu-qǐlái]*].
drunk DE Zhangsan cannot-stand-up
'Zhangsan got so drunk that he couldn't stand up.'
(10) **e** *jīdòng de [Zhāngsān shuō-bù-chū huà lái]*].
excited DE Zhangsan cannot-speak-out words come
'Zhangsan was so excited that he couldn't speak a word.'

In these sentences, the understood subject of V1 ('drunk', 'excited') is also the subject of V2. But the subject occurs in overt form only with V2, not with V1. If V1 is the main verb, as shown by the bracketing given, then we have a configuration in which the empty subject asymmetrically c-commands its antecedent. This is in direct violation of a very general constraint on anaphoric relations, namely 'Condition C' of Chomsky's 1981 Binding Theory, which requires all referential expressions to be free in reference from any c-commanding argument. In clear cases where V1 is the main verb, as in 11–12 below, coreference of the matrix and the embedded subject is clearly out:

(11) a. *$\mathbf{e}_i$ *shuō* [*Zhāngsān$_i$ bù néng lái*].
say Zhangsan not can come
b. *$tā_i$ *shuō* [*Zhāngsān$_i$ bù néng lái*].
he say Zhangsan not can come

(12) a. **He$_i$ said that John$_i$ won't come.*
b. **He$_i$ started to cry as soon as John$_i$ arrived home.*

If V1 is the main verb in 1–3, in accordance with the SP hypothesis, then Condition C should rule out 9–10 exactly as it does 11–12. However, if 9–10 are assumed to have the structure given in Fig. 3 in accordance with the PP hypothesis, then the problem again disappears. In this structure the antecedent *Zhangsan* is the main clause subject and the empty category is the subject of an adverbial clause (cf. Fig. 1c for ex. 3). Coindexing of the two subjects (neither of which c-commands the other) is of course allowed in such configurations, as examples like the following abound:

(13) $\mathbf{e}_i$ *yī huí dào jiā, Zhāngsān$_i$ jiù kū.*
once return to home Zhangsan then cry
'As soon as [he] arrived home, Zhangsan started to cry.'

Compare also the English translation of this sentence to the ill-formed 12b.

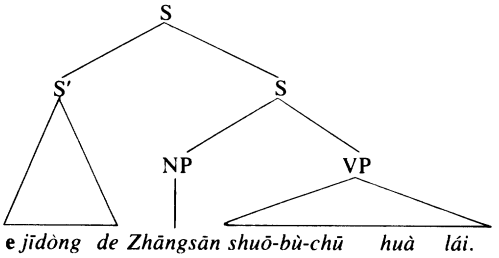

FIGURE 3.

Let us now reconsider each of the arguments which have been claimed to present problems for the Secondary Predication hypothesis, starting again with A-not-A questions.

A-NOT-A QUESTIONS

3.1. EMBEDDED A-NOT-A FORMS. First consider the problem regarding A-not-A questions and *bù*-negation. Recall that a crucial assumption underlying this argument is that the verb that takes the A-not-A form in an A-not-A question is the main verb of that question. But this is a false generalization that seems to have been inherited from Chao 1968 by everyone who subscribes to the Primary Predication theory. A clear counterexample to this crucial assumption is the following sentence:

(14) *ni rènwéi* [*tāmen huì-bù-huì lái*]*?*
you think they will-not-will come
'Do you think that they will come or do you think they won't?'

The entire sequence in 14 is a direct A-not-A question, having the interpretation indicated in the English translation. But the A-not-A form occurs in the embedded clause, with the embedded (auxiliary) verb. Numerous similar examples can be constructed in which the main verb selects a declarative clause as its complement.[3] This sentence is not very different from an ordinary WH-in-situ question in Chinese with its relevant WH-phrase appearing in the base (D-Structure) position of an embedded clause:[4]

(15) *nǐ rènwéi [tāmen zuì xǐhuan shéi]?*
you think they most like who
'Who do you think they like most?'

There are of course sentences where an A-not-A form cannot appear in an embedded clause. In particular, the distribution of the A-not-A form is considerably more restricted than that of an ordinary WH-word. As shown in 16, a direct WH-question can have the WH-word appearing in a sentential subject, an adjunct island, and a complex NP:

[3] Note that the PP hypothesis only requires that the A-not-A form occur with the main verb OF A GIVEN A-NOT-A QUESTION, but does not rule out indirect or embedded A-not-A questions having embedded A-not-A forms. Thus well-formed sentences like the following are not counterexamples to this hypothesis:

(i) *wǒ xiǎng-zhīdào [nǐ xǐ-bù-xǐhuān tā].*
I wonder you like-not-like he
'I wonder whether you like him or not.'

(ii) *[nǐ xǐ-bù-xǐhuān tā] bù zhòngyào.*
you like-not-like he not important
'Whether you like him or not is not important.'

In these sentences, the main verb selects an interrogative argument. In both cases, the A-not-A form occurs with an embedded verb, but the relevant embedded verb is the main verb of the embedded A-not-A question. Examples like 14 in the text are genuine counterexamples, however, since these are direct questions whose main verbs do not occur in A-not-A form.

[4] Incidentally, although 15 can easily be translated into English by simply fronting the relevant WH-phrase, the exact meaning of 14 requires a more elaborate translation. This is because the English sentence *Do you think they will come or not?* is ambiguous, depending on whether the question is with the matrix or the embedded predicate (see Larson 1985 for discussion), while 14 in Chinese is not. This difference between the two languages seems to be related to the fact that while English is a (syntactic) WH-movement (or WH-in-COMP) language, Chinese is a WH-in-situ language. For a situation similar to 14, consider *why* questions in both languages. The English question in (i) is ambiguous, but the Chinese questions in (ii)–(iii) are not, each corresponding to one of the two interpretations of (i).

(i) *Why do you think John came?*

(ii) *nǐ wèishénme rènwéi [Zhāngsān lái-le]?*
you why think Zhangsan come-ASP
'Why$_i$ do you think [Zhangsan came] t_i'?

(iii) *nǐ rènwéi [Zhāngsān wèishénme lái-le]?*
you think Zhangsan why come-ASP
'Why$_i$ do you think [Zhangsan came t_i]'?

This difference clearly arises from the fact that *why* is in COMP in English (ambiguously binding a trace in the main or the embedded clause), but in situ in Chinese. In a similar way, we may say that while Chinese has its A-not-A operator in situ, English has its 'A-not-A' (i.e. *whether*) in COMP.

(16) a. [*wǒ kǎn náběn shū*] *bǐjiào hǎo?*
I read which book comparatively good
'That I read which book is better?'
('Which book is it more suitable that I read?')

b. [*nǐ kànjiàn shéi de shíhòu*], *Zhāngsān shuì-zháo le?*
you see who REL time Zhangsan fall-asleep ASP
'When you saw who, Zhangsan was already asleep?'
('Who is the person such that, when you saw him, Zhangsan was already asleep?')

c. *nǐ zuì xǐhuān* [*pīpíng shéi de shū*]?
you most like criticize who REL book
'You like books that criticize who?'
('Who is the person such that you like books that criticize him?')

But the verb in such constructions cannot appear in A-not-A form and have scope over the matrix sentence:

(17) a. *[*wǒ kàn-bù-kàn zhèběn shū*] *bǐjiào hǎo*]?
I read-not-read this book comparatively good

b. **tā lái-bù-lái de shíhòu, Zhāngsān shuì-zháo le*
he come-not-come REL time Zhangsan fall-asleep ASP

c. **nǐ zuì xǐhuān* [*tā kàn-bu-kàn de shū*]?
you most like he read-not-read REL book

However, the ill-formedness of these sentences has nothing to do with the A-not-A form being in an embedded clause per se, but is due rather to the fact that the interpretation rule that is associated with these sentences violates island constraints. In Huang 1982, 1983 I have argued that the distinction between 16 and 17 is due to the Empty Category Principle (ECP) of Chomsky 1981 applying at the level of Logical Form (LF). The relevant distinction here is that, whereas 16 involves WH-phrases in complement (object) positions, 17 involves interrogative elements (the A-not-A forms) in adjunct, non-argument positions. Assuming that the WH-phrases and the A-not-A forms are WH-moved in LF to an A′ position c-commanding the matrix S, the distinction between 16 and 17 is reduced to that between a complement trace and an adjunct trace resulting from long extraction—a distinction that falls nicely under the ECP. For example, after WH-movement in LF, 16a and 17a have the following structures:[5]

(18) [*náběn shū*$_i$ [$_S$ [$_{S'}$ *wǒ kàn* t_i] *bǐjiào hǎo*]?
which book I read comparatively good

(19) *[*kàn-bù-kàn*$_i$ [$_S$ [$_{S'}$ *wǒ* t_i *zhèběn shū*] *bǐjiào hǎo*]?
read-not-read I this book comparatively good

The ECP requires a trace to be properly governed, and a trace is properly governed if and only if it is either lexically governed or antecedent-governed.

[5] I assume that an A-not-A question is a sentence whose INFL has the feature [+wh] which is phonetically realized by a reduplication of a [+V] (verb or auxiliary) element immediately following it. Thus, the trace in 19 is actually that of the INFL with [+wh]. An INFL trace is treated on a par with an adjunct in not being 'lexically governed'.

In both 18 and 19 the trace is too far from the moved category to be antecedent-governed by it, so in order to satisfy the ECP both traces must be governed by a lexical category. In 18 this requirement is satisfied, since the complement trace is lexically governed by the verb 'read'. In 19, however, the adjunct trace is not governed by any lexical category, so this structure is ruled out by the ECP at LF. This explains why 17a cannot be used as a direct A-not-A question meaning, 'Is it better for me to read this book, or is it better for me not to read this book?'[6] The other sentences in 16 and 17 illustrate the same kind of asymmetry and can be explained in the same way.[7]

Thus, abstracting away from independent principles, there is no independent restriction against an A-not-A question whose embedded verb takes A-not-A form.

3.2. *YǑU/-LE* ALTERNATION. The grammaticality of sentences like 14 falsifies the hypothesis that only main verbs can occur in the A-not-A form. Therefore, the grammaticality of 5a and 6a does not provide evidence that V2 is the main verb in these sentences. We are now left with the other half of the problem: If V1 is the main verb in 1–3, why can't it take the A-not-A form? This question is significant since it has otherwise been assumed that all clear main verbs are capable of occurring in A-not-A form, and adoption of the PP hypothesis provides an immediate prima facie solution by eliminating the question altogether. I will show, however, that this solution is only an illusion, and that there is an alternative, more desirable, account for the facts under consideration.

Note that a similar question arises in connection with the well-known alternation of perfective aspect markers in this language, first treated in Wang's important work (1965). Wang observed that the two elements *-le* and *yǒu,* both having a meaning and function similar to that of the perfective aspect, are in complementary distribution. The marker *-le* occurs only as a suffix to a verb in affirmative sentences, while *yǒu* occurs only as an auxiliary preceding the verb in negative or A-not-A contexts. This is shown in 20. (The negative morpheme *bù* takes the allomorphic form *méi* just in case it immediately precedes *yǒu* 'have', whether the latter is used as a main verb or as an auxiliary.)

[6] The following sentence is grammatical, however, with the sentential subject interpreted as an indirect A-not-A question:

(i) [*wǒ kàn-bu-kàn zhèběn shū*] *méiyǒu guānxì.*
I read-not-read this book not-have relation
'Whether I read this book or not doesn't matter.'

This is also predicted by the ECP. Since in an indirect question the scope of the interrogative element is restricted to an embedded clause, the A-not-A element is short-moved to a position c-commanding the sentential subject, but not beyond it. The trace, though not lexically governed, is antecedent-governed in this case in accordance with the ECP.

[7] This ECP account of complement/adjunct asymmetries receives extensive further support from other areas of English and Chinese syntax, and from other sources, as can be seen from works like Lasnik & Saito 1984, Chomsky 1986, Koopman & Sportiche 1986, Carstens 1986 and references cited there. Work by Larson 1985 also shows that the interpretation of disjunction scope in English is constrained by ECP, in a way similar to that of A-not-A questions in Chinese.

(20) a. *tāmen piàn-le Lǐsì.*
they cheat-PERF Lisi
'They cheated Lisi.'
b. *tāmen méi yǒu piàn Lǐsì.*
they not have cheat Lisi
'They did not cheat Lisi.'
c. *tāmen yǒu-méi-yǒu piàn Lǐsì?*
they have-not-have cheat Lisi
'Did they cheat Lisi?'

Crucially, the main verb *piàn,* if suffixed with perfective *-le*, cannot be negated or occur in A-not-A form:

(21) **tāmen bù piàn-le Lǐsì.*
they not cheat-PERF Lisi
(22) **tāmen piàn-bù-piàn-le Lǐsì?*
they cheat-not-cheat-PERF Lisi

In order to use the perfective *-le* in these contexts, something must be inserted before the main verb. For example, 23, with the copula *shì* (here used as a marker for the emphatic modality), allows *-le* in these contexts.

(23) a. *tāmen bù shì piàn-le Lǐsì.*
they not be cheat-PERF Lisi
'It is not the case that they cheated Lisi.'
b. *tāmen shì-bù-shì piàn-le Lǐsì?*
they be-not-be cheat-PERF Lisi
'Is it the case that they cheated Lisi?'

A related fact is indicated in 24:

(24) a. *tāmen lái le.*
they come PERF/INCH
'They came/have come.' (Perfective)
'They come now.' (Inchoative)
b. *tāmen bù lái le.*
they not come INCH
'They do not come any more.'
c. *tāmen méi yǒu lái.*
they not have come
'They did not come.'

It is fairly well known that a sentence-final *-le* immediately following a verb has two aspectual meanings: perfective or inchoative (see Teng 1973 and Li & Thompson 1981 for discussion). This is reflected in the ambiguity indicated for 24a. However, the perfective meaning disappears in a negative context, as shown in 24b (cf. 24c), thus showing again that the perfective *-le* is incompatible with an immediately preverbal *bù.*

This range of facts is accounted for by Wang 1965 in terms of a rule of 'affix-hopping', which obligatorily shifts a base-generated *yǒu* to postverbal position in affirmative contexts (followed by a morphophonemic rule of *yǒu* → *-le*) but is blocked otherwise.

The pattern of *-le/yǒu* alternation shows that it is not true that all main verbs can be directly negated and occur in A-not-A form. There is no doubt that in sentences like 20a 'cheat' is the main verb. But it cannot be negated by *bù* or A-not-A-questioned. This further shows that the distribution of *bù* and A-not-A questions is independent of the identification of the main verb.

3.3. THE SCOPE OF *BÙ*. What explains the *-le/yǒu* alternation anyway? Wang's 1965 treatment involving affix-hopping seems to be an accurate description of an important pattern in Chinese grammar, though the very existence of this pattern remains to be explained. As a step toward a possible explanation I propose the following principle:

(25) Principle P: The negative morpheme *bù* forms an immediate construction with the first V^0 element following it.

Assume that *bù* is locally (Chomsky)-adjoined to V^0. This has the effect of creating a negated V. Consider now the ill-formed 21–22. According to 25, the relevant portion of the structure of 21 is as follows:

(26) [[$_{V^0}$ *bù* [$_{V^0}$ *piàn*]] *le*]
not cheat PERF

According to this structure, the negative is first attached to the verb 'cheat', and then the perfective *-le* is attached to the negated verb. But such a structure must be ruled out for semantic reasons: it is absurd to assign the perfective to a negated verb, just as it is contradictory to assert the completion of some event that one says does not happen.[8] For a similar reason, a verb that is being A-not-A-questioned cannot take the perfective.[9]

Consider now the well-formed 20b. Assuming *yǒu* 'have' to be a member of the AUX complex dominated by INFL, the structure of 20b is then 27, given Principle P:

(27) [$_S$ *tāmen* [$_{INFL}$ *méi yǒu*] [$_{VP}$ *piàn Lǐsì*]]
they not have cheat Lisi

[8] I am, of course, referring to 'contradictory negation' but not to 'contrary negation' in this case. In the latter case, a negative lexical verb like *undo, disprove, fail* (*to* V), can of course take the perfective.

[9] That is, assuming that an A-not-A question involves a [+wh] INFL in preverbal position that is also subject to a principle like 25. This semantic explanation for the ill-formedness of 21–22 is in line with that of Li & Thompson (1981:205). In their terms *-le* is used only with expressions of a 'bounded event', and since an event that does not happen (or whose existence is being questioned) is not a bounded event, it cannot take *-le*. However, Li & Thompson do not provide us with a crucial step to arrive at this explanation. More specifically, note that in the absence of something like our Principle P, there is no reason why strings like 21–22 may have only the semantically incompatible interpretations. It is not obvious, in the absence of 25, why one cannot negate or question a proposition expressing a 'bounded' event (e.g. asserting that it is not the case that they cheated Lisi). Such would be the case, in fact, if the relevant part of 21 had the structure [*bù*[*piàn-le*]] with the negation having scope over the perfective verb *piàn-le*. Li & Thompson's proposal, in other words, does not by itself rule out 21 as a way of expressing the message conveyed by the well-formed 20b, and thus falls short of providing a real explanation. Notice, however, that this latter situation is excluded by Principle P. This principle is proposed here because it is needed to put the relevant idea to work.

What we have here is a negated perfective 'have' which has scope over the entire VP. This sentence conveys the perfectly sensible message that their cheating of Lisi has not taken place. The occurrence of preverbal *yǒu* has the effect of 'insulating' (so to speak) the main verb 'cheat' from being directly negated. Similarly, in 23a the insertion of *shì* keeps the *bù* in INFL, and the result is a negated *shì* having scope over the entire VP containing *-le*.

(28) [S *tāmen* [INFL *bù-shì*] [VP *piàn-le Lǐsì*]].
they not-be cheat-PERF Lisi
'It is not the case that they cheated Lisi.'

The use of a preverbal *shì* or *yǒu* thus has the effect of 'do-support', in preventing *bù* from being cliticized to the main verb in cases where this would lead to absurdity.[10]

If this interpretation of *-le/yǒu* alternation is on the right track, then we also have an explanation for why V1 cannot be negated or A-not-A-questioned when followed by a resultative or descriptive expression, as in 1–3. Principle P requires that sentences with *bù* preceding V1 have structures like 29:

(29) a. **tāmen* [[*bù-pǎo*] *de hěn kuài*].
they not-run DE very fast
b. **tāmen* [[*pǎo-bù-pǎo*] *de hěn kuài*]?
they run-not-run DE very fast

These strings are ruled out semantically because they assert that someone is fast with respect to some event, but at the same time presuppose the non-existence of, or question the existence of, the relevant event. Notice that our theory predicts, correctly, that *bù* or A-not-A can precede V1 as long as it is supported by an element in INFL:

(30) a. *tā méi-yǒu pǎo de hěn kuài.*
he not-have run DE very fast
'He did not run fast.'
b. *tā bù-shì pǎo de hěn kuài.*
he not-be run DE very fast
'It is not the case that he runs fast.'
c. *tā bù-huì pǎo de hěn kuài.*
he not-will run DE very fast
'He will not run fast.'

(31) a. *tā yǒu-méi-yǒu pǎo de hěn kuài?*
he have-not-have run DE very fast
'Did he run fast?'
b. *tā shì-bù-shì pǎo de hěn kuài?*
he be-not-be run DE very fast
'Is it the case that he runs/ran fast?'

[10] The 'do-support' effects of *shì* and *yǒu* have also been pointed out by Moira Yip. It is also possible to pursue a non-semantic explanation of the facts under discussion, as Yip 1986 has set out to do for a range of related facts in Cantonese.

c. *tā néng-bù-néng pǎo de hěn kuài?*
he can-not-can run DE very fast
'Can he run fast?'

In this connection, compare the following English data:

(32) *Does he run fast?*
a. ?**No, he doesn't run.*
b. *No, he runs slow.*

As shown, 32 cannot simply be a yes/no question about whether he runs or not. On the other hand, it can be a question about the truth of *fast* alone, or about the truth expressed by the entire string *run fast*. Similarly, *He doesn't run fast* can be a negation of *fast* alone or of the combination of *run+fast*, but not of *run* alone. These patterns are clearly similar to the Chinese facts under consideration. The difference is that the patterns are displayed more 'overtly' in Chinese than in English. In Chinese, V2 alone is negated or questioned when it is directly preceded by *bù* or when it is turned into an A-not-A form. The entire combination V1 + V2 is negated or questioned when *bù* or the A-not-A form appears in the matrix INFL (as in 30–31) c-commanding both V1 and V2. Given our Principle P, a sentence in which V1 is directly preceded by *bù* or appears in A-not-A form would be interpreted as one that negates or questions V1 alone, and such sentences are ruled out as ill-formed for the same reason that explains the possible interpretations of 32 in English.

Again, note that 32 also shows that the distribution of A-not-A and *bù* is independent of the syntactic notion of main-verb-hood. Both English and Chinese are subject to the restriction that V1 *run* cannot be negated or questioned alone. But in English there is no doubt that V1 is the main verb. So the same semantic fact cannot be used to establish that, in Chinese, V2 is the main verb.

3.4. MORE ON PRINCIPLE P. Principle P thus seems to enable us to explain the facts in a rather plausible way, as it ties together two heretofore unrelated areas of Chinese syntax: *-le/yǒu* alternation and the distribution of A-not-A and negation in sentences like 1–3. It is clear that an explanation of 1–3 based on analyzing V2 as the main verb does not also account for *-le/yǒu* alternation.

However, it is unlikely that Principle P exists as an independent principle of Chinese. It would be highly desirable to derive it as a theorem from some other general principle(s) of Universal Grammar. There may be a general principle that NEG must be attached to, and lexically realized with, a V^0 (or more generally X^0) element. This may, in turn, be a special case of the more general requirement that elements in INFL (tense, AGR, and other elements of modality) must be lexically realized, a requirement that motivates Koopman's 1984 theory of verb-movement, for example (cf. also Chomsky 1986).[11] In line with the V-movement hypothesis, we may assume that *bù* is base-generated as a bound form in an INFL node which, if containing no lexical material, triggers Koop-

[11] The requirement to realize INFL lexically may still be reduced to deeper reasons, e.g. so as to enable INFL to assign Case to the subject (Koopman 1984).

man's verb-raising rule. Adopting the extended X′ notation of Chomsky 1986, a sentence like *tāmen bù xǐhuān Lǐsì* 'They do not like Lisi' will then have the structure in 33:[12]

(33) [$_{IP}$ *tāmen* [$_{I'}$ [$_{I^0}$ *bù* *xǐhuān*$_i$] [$_{VP}$ [$_{V^0}$ t_i] *Lǐsì*]]]
they not like Lisi

Whether or not Principle P can be further derived in this way, it suffices for our purposes to show that there is some real evidence that *bù* forms an immediate constituent with the zero-level category that follows it. For example, there are certain lexical items that are clearly the result of fusion of *bù* + V^0. Three such examples are shown in 34:

(34) *bù + yào = bié* *(nǐ) bié lái!* '(You) don't come!'
bù + yǒu = méiyǒu *tāmen méiyǒu lái.* 'They didn't come.'
bù + yòng = béng *nǐ béng lái le.* 'You needn't come now.'

The intimate relationship between *bù* and the immediately following element is also evident from historical data. Since Ting 1933, it has been widely recognized as a fact of Archaic Chinese that when *bù* was immediately followed by the pronoun *zhī* 'it', the two syllables fused into *fú*. Consider the following passage from *Lǐjì*, or the *Book of Rites*:

(35) *suī yǒu jiā yáo, fú shí, bù zhī qí zhǐ ye;*
though have good food, not-it eat not know its taste PRT
suī yǒu zhì dào, fú xué, bù zhī qí shàn ye;
though have top truth, not-it learn not know its good PRT
shì yǐ xué ránhòu zhī bù zú, ...
this reason learn afterwards know not enough
'Even though you may have good food, if you don't eat it you won't know its taste. Even though there are top theories of truth, if you do not learn them you won't know their virtue. For this reason, one realizes one's lack of sufficient knowledge only after one has learned, ...'

In this example, note crucially that the negative form *fú* is only followed by a transitive verb WITHOUT an overt object, whereas the form *bù* is only followed by a transitive verb with an object or by an intransitive verb. The semantics of each sentence, furthermore, indicates that the missing object must be *zhī* 'it'. Given that pronominal objects in Archaic Chinese occurred preverbally in negative and interrogative contexts (possibly a case of cliticization as in some Romance languages, among others), examples like 35 provide strong evidence for Ting's 1933 claim that *fú* is the result of fusing *bù* and *zhī*.

The close relationship between *bù* and the following element is also evidenced by the fact that NEG cannot occur without a following lexical element:[13]

[12] This requires that there be an INFL node immediately preceding *kuài* in *tāmen pǎo de kuài* 'they run fast', which in turn entails that *kuài* is dominated by IP in addition to AP.

[13] That the negative *bù* does not occur freely has been observed by several scholars. See Yang 1971 and the references cited there. One exception to this generalization is the use of *bù* to mean 'no', as in *bù, tā méi lái* 'No, he didn't come'.

(36) **Zhāngsān xǐhuān zhèběn shū, Lǐsì bù.*
Zhangsan like this book Lisi not
*'Zhangsan likes this book, (but) Lisi not.'

(37) *Zhāngsān xǐhuān zhèběn shū, Lǐsì bù xǐhuān.*
Zhangsan like this book Lisi not like
'Zhangsan likes this book, (but) Lisi doesn't.'

Finally, there is also some possible evidence for the supposition that V movement has taken place in contexts like 37. According to the V-movemer hypothesis, the verb *xǐhuān* 'like' in the second clause of 37 has moved out c VP into INFL, where it forms an immediate constituent with *bù*. Therefor following *xǐhuān* in 37, there is a null VP (and not just a null object). This ide coincides with the intuition that Chinese sentences like 37 are really on a pa with VP ellipsis constructions in English. Consider the following Englis sentences:

(38) a. **John likes this book, but Bill not.*
b. *John likes this book, but Bill doesn't.*

The auxiliary *do* in 38b seems to serve no more purpose than to lexically suppo an element in INFL. Now, the repetition of the verb *xǐhuān* 'like' in 37 als seems to serve no other purpose than 'do support'.[14] That is, although the ver is repeated in 37, there is no more content of a VP node in the second claus of 37 than there is in its English translation, or in 38b. The idea that the secon clause of 37 contains a null VP rather than a mere null object also receive support from the fact that such apparent 'null-object constructions' exhib strict/sloppy ambiguity of the sort typical of VP ellipsis. Thus, just as 39 i ambiguous between a strict (referential) and a sloppy (bound-variable) readin of the deleted pronoun *his* in English, the Chinese sentence 40 is ambiguou in a similar way:

(39) *John saw his mother, and Mary did, too.*

(40) *John kànjiàn-le tāde māma, Mǎlì yě kànjiàn-le.*
John see-PERF his mother Mary also see-PERF
'John saw his mother, and Mary did, too.'

In both 39 and 40, either John and Mary saw the same woman (the stric reading), or both of them saw their own respective mothers (the bound-variabl reading). There is no third reading: if John and Mary saw different womer then they must have seen their own mothers. This range of facts in Englis receives a fairly natural explanation from the theory developed by Sag 197 and Williams 1977. According to Sag's account, for example, 39 is characterize as well-formed just in case the empty VP corresponds in Logical Form to a λ expression that is an 'alphabetic variant' of the λ-expression associated wit the antecedent VP. If the antecedent VP in 39 is translated into λ*x* (*x saw hi mother*), the pronoun *his* is taken to be referential. The empty VP will b

[14] The correlation of the lack of an actual process of 'do-support' with the need to repeat a ver has been observed for Japanese by Kuno 1978. Whereas Kuno takes this correlation at its fac value to explain why there is no VP ellipsis in Japanese, I am suggesting that examples such a 37 are indeed examples of VP ellipsis (in disguise).

translated into the same expression, and we have the strict reading. On the other hand, if the antecedent is translated into λ*x* (*x saw x's mother*), then the pronoun is taken to be a variable bound to whoever the λ-predicate is a predicate of, and we have the sloppy reading. This account correctly predicts that the antecedent of the sloppy pronoun is restricted to the binder of the λ-expression (the LOCAL SUBJECT of the empty VP). Thus, although 41 has a sloppy reading according to which Bill saw Bill's mother, it does not have another sloppy reading according to which Bill saw Mary's mother:

(41) *John saw his mother, and Mary knew that Bill did, too.*

Crucially, all this is achieved under the assumption that the availability of a sloppy reading depends on the existence of a category corresponding to a λ-expression. Turning now to the Chinese example in 40, if it is hypothesized that the second clause is followed by a null VP whose verb has been raised to INFL, the strict/sloppy ambiguity of the sentence follows immediately, and so does the lack of a second sloppy reading (meaning that Bill saw Mary's mother) in 42:

(42) *John kànjiàn-le tāde māma, Mǎlì zhīdào Bill yě kànjiàn-le.*
John see-PERF his mother Mary know Bill also see-PERF
'John saw his mother, and Mary knew that Bill did, too.'

If, on the other hand, the second clause of 40 is assumed to have merely a null object, such an empty category would not be translated into a lambda predicate, since NPs denote individuals but not properties. In order to allow for one (but not more than one) sloppy reading in 40 and 42, it would be necessary to state ad hoc conditions on the null object which duplicate precisely the Sag-Williams account, but which miss an important generalization otherwise captured by that account.

3.5. AN APPARENT COUNTEREXAMPLE. Our consideration of the distribution of *bù* and A-not-A questions will not be complete without a mention of sentences of the following sort (brought to my attention by Y.-H. Audrey Li):

(43) *rúguǒ nǐ bù pǎo de kuài, nǐ jiù dé-bù-dào jiǎngpǐn.*
if you not run DE fast you then can't-get prize
'If you don't run fast, then you won't get the prize.'

(44) *bùguǎn tā pǎo-bù-pǎo de kuài, nǐ dōu dé-bù-dào jiǎngpǐn.*
regardless he run-not-run DE fast you all can't-get prize
'Regardless of whether he runs fast or not, you won't get the prize.'

These sentences each contain an adverbial clause whose V1 (but not V2) directly follows *bù* (as in 43) or occurs in A-not-A form (as in 44). These sentences directly falsify the PP hypothesis, which crucially assumes that only V2 may take *bù* or the A-not-A form and which identifies V2 as the main verb on the basis of this (now false) assumption. On the other hand, these sentences do not falsify the SP hypothesis, which does not relate the identity of a main verb to the distribution of *bù* and A-not-A; but they do raise a question about our analysis under this hypothesis, in particular our Principle P. If, according to this principle, *bù* forms an immediate constituent with V1 in 43–44, then the

same semantic constraint that was invoked to rule out sentences like 21–22, and the (b) sentences of 5–7, should also rule out 43–44.

It can be shown, however, that the sentences 43–44 do not present a real problem for our analysis. What our analysis predicts, in these cases, is that *bù* is not immediately attached to *pǎo* in such contexts as 43–44, though it is in the other contexts. There is reason to believe that this is indeed the situation.

One obvious difference between 43–44 on the one hand and 21–22, 5b, 6b, 7b on the other is that in the former, but not in the latter, the V1-V2 sequence is embedded as an adverbial adjunct clause which carries with it a meaning of volition or of future modality, though the element of modality is not overtly expressed with words like *huì* 'will' or *xiǎng* 'want to'.[15] What is crucial is not that the clause containing V1-V2 must be embedded per se, but that it has a (possibly abstract) future or volition modality in it. In fact, although one of them was marked as ungrammatical, in fact both sentences in 7 (repeated below) are grammatical as long as they are understood with the right meaning:

(7) a. *tāmen pǎo de bù kuài.*
they run DE not fast
'They don't run fast.'
b. *tāmen bù pǎo de kuài.*
they not run DE fast
'They won't run fast.'

In particular, 7b means that they won't run fast (meaning perhaps that they refuse to do so), but cannot be understood as a general statement about them that they don't run fast. The semantic contrast between 7a and 7b is nicely brought out in the following contexts:

(45) a. *tā pǎo de bù kuài, shì yīnwèi tā pǎo-bù-kuài.*
he run DE not fast be because he can't-run-fast
'He doesn't run fast, because he can't run fast.'
b. *tā bù pǎo de kuài, shì yīnwèi tā bù xiǎng pǎo.*
he not run DE fast be because he not want run
'He won't run fast, because he doesn't want to run.'

The semantic contrast suggests that in 43–44, 7b, and 45b, there is an abstract modality element in INFL that supports *bù* and prevents *bù* from forming an immediate constituent with the verb *pǎo*, and these sentences are well formed because no semantic anomaly of the sort described above need arise. Stated in a slightly different way, the *bù* in these sentences means 'won't' and not simply 'not'. And the A-not-A question in 44 is a question about the choice between 'will' and 'won't', not about the choice between 'run' and 'not run'.[16]

[15] In English, the future modality is also unexpressed in conditional clauses, as in *If it rains tomorrow, ...*

[16] A question arises here as to how we get the form *pǎo-bù-pǎo* in 44 even when the sentence is a question about an abstract modal, 'will or won't'. In Huang 1987 I show that an A-not-A question is a constituent question with a [+wh] INFL constituent (much as a *why*-question is a constituent with a [+wh] adverbial constituent). This [+wh] INFL is phonetically realized in Mandarin Chinese via a rule of reduplication, which reduplicates a phonetic string to its right and inserts

The situation observed here in Mandarin with sentences like 43–45 is also observable in other Chinese languages. For example, in Taiwanese the negative morpheme *m* cannot in general occur without a following verb or auxiliary (see Li 1971 and Lin 1974):

(46) a. *li u chi: asi bou?* (*bou* = *m* + *u*)
you have money or not-have
'Have you money or haven't you?'

b. **li u chi: asi m?*
you have money or not

(47) a. *li ai chitbun chheh asi m-ai?*
you like this book or not-like
'Do you like this book or don't you?'

b. **li ai chitbun chheh asi m?*
you like this book or not

(48) a. *li bat khi Bikok asi m-bat?*
you EXP go America or not-EXP
'Have you been to America or haven't you?'

b. **li bat khi Bikok asi m?*
you EXP go America or not

These examples echo our 36–37 in Mandarin, providing further evidence for our Principle P. An exception occurs, however, in sentences like the following (but only in such sentences):

(49) a. *li be khi Bikok asi m-ai?*
you want-to go America or not-want
'Do you want to go to America or don't you want to?'

b. *li be khi Bikok asi m?*
you want-to go America or not
'Do you want to go to America or not?'

As indicated in 49b, the negative *m* can occur alone precisely where it is related to a volitional modality, so that it really means 'won't' or 'not want to', not simply 'not'.[17] Again, the seemingly exceptional behavior of *m* in 49b can be explained by the postulation of an abstract element in INFL which combines with *m* into a negated INFL.

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bù between the original and its copy. *Pǎo-bù-pǎo* is the phonetic realization of the [+wh] INFL in 44, and no V-raising has taken place here. What is being questioned is not *pǎo*, but the abstract INFL c-commanding the entire VP. There is independent evidence that the scope of the question is not related to the length of the reduplicated string. For example, the reduplication can affect a meaningless subpart of a verb, as in (i):

(i) *nǐ xǐ-bù-xǐhuān Lǐsì?*
you like-not-like Lisi
'Do you like Lisi or not?'

Although what is reduplicated is the first (meaningless) syllable of *xǐhuān* meaning 'like', the question is clearly not about such meaningless elements.

[17] This is the reason why Li 1971 postulates the occurrence of two *m*'s in Taiwanese: m_1 and m_2: m_1 is the pure negative which cannot occur free and m_2 is the negation of 'want to' and can occur free.

We can conclude, then, that although sentences like 43–44 directly falsify the PP hypothesis, they not only do not constitute a problem for the SP hypothesis but, in fact, provide additional confirmation for a prediction made by our analysis.

LE-SUFFIXATION

4. Let us now consider the second argument for the PP hypothesis. The crucial fact regarding 1–3 is that only V2—not V1—may be suffixed with *-le*. Here again, I will show that this does not bear on which of the two verbs is the main verb.

On the one hand, any verb that can take *-le* in a main clause can also take *-le* when embedded under such verbs as 'think' or 'say':

(50) a. *Lǐsì dǎ-le tā.*
Lisi hit-PERF he
'Lisi hit him.'

b. *Zhāngsān yǐwéi Lǐsì dǎ-le tā.*
Zhangsan think Lisi hit-PERF he
'Zhangsan thought that Lisi hit him.'

On the other hand, there are many main verbs that cannot take *-le*. It is well known, for example, that stative predicates do not take *-le*:

(51) **tāmen xǐhuān-le Lǐsì.*
they like-PERF Lisi
'They liked Lisi.'

As Li & Thompson have argued, a central requirement for the use of the suffix *-le* is that the verb to which it is attached must be one that denotes a 'bounded event', i.e. an event being viewed in its entirety (1981:185–202). Ex. 51 is thus ill-formed because the stative verb 'like' does not express an event, much less a 'bounded' one. This condition, it seems, is enough to explain why in 1–3 the main verb cannot take *-le*. Although verbs like *pǎo* 'run', *tiào* 'jump', and *kū* 'cry' can express bounded events and can take *-le* in simple sentences, when they are followed by a descriptive expression they do not BY THEMSELVES refer to bounded events. In Li & Thompson's terminology, sentences like 1 are 'complex stative constructions', and as stative constructions their verbs of course do not take *-le*:[18]

(52) **tāmen pǎo-le de hěn kuài.*
they run-PERF DE very fast
'They ran very fast.'

[18] Compare 52 to the well-formed (i), where *pǎo* does take *-le*:

(i) *tāmen hěn kuài de pào-le.*
they very quickly DE run-PERF
'They very quickly ran away.'

The essential difference between a postverbal and a preverbal *hěn kuài* is that a sentence with postverbal *hěn kuài* is stative, expressing general properties, whereas one with preverbal *hěn kuài* is active, referring to specific (and often bounded) events. In this regard, consider also the difference between *fast* and *quickly* in English. A preverbal manner adjunct seems to necessarily refer to specific events, but a postverbal adverb can be generic: **He quickly runs, He runs quickly;* **He fast ran, He ran fast.*

As for the resultative constructions in 2–3, even though such constructions AS A WHOLE may denote bounded events, it is by virtue of the resultative complement denoted by V2 that they do so. That is, the resultative clause containing V2 does the job of 'perfectivizing' V1 (Li & Thompson 1981:206). The V1 in each case does not in itself denote a bounded event, and therefore does not take *-le*.[19]

BINDING CONDITION C

5.1. IRRELEVANCE OF THE CONDITION. Consider now the argument involving sentences like 9–10, repeated below:

(9) [**e** *zuì de* [*Zhāngsān zhàn-bù-qǐlaí*]].
drunk DE Zhangsan cannot-stand-up
'Zhangsan got so drunk that he couldn't stand up.'

(10) [**e** *jīdòng de* [*Zhāngsān shuō-bù-chū huà lái*]].
excited DE Zhangsan cannot-speak-out words come
'Zhangsan was so excited that he couldn't speak a word.'

These sentences present an important problem for the SP hypothesis because, under this hypothesis, the understood logical subject of V1 c-commands its antecedent, in violation of Condition C. The problem does not arise under the PP hypothesis, because V1 and its subject would be contained in an adverbial clause, and neither the empty category nor its antecedent c-commands the other. This is a very interesting piece of prima facie evidence for Primary Predication.

There is an important fact about these sentences, however, that previous researchers have not noticed. This concerns a crucial semantic difference between 9–10 and the following counterparts, where the subject position of V1 is filled with *Zhāngsān* and that of V2 with an empty category:

(53) *Zhāngsān*$_i$ *zuì de* [**e**$_i$ *zhàn-bù-qǐlái*].
Zhangsan drunk DE cannot-stand-up
'Zhangsan was so drunk that he couldn't stand up.'

(54) *Zhāngsān*$_i$ *jīdòng de* [**e**$_i$ *shuō-bù-chū huà lái*].
Zhangsan excited DE cannot-speak-out words come
'Zhangsan was so excited that he couldn't speak a word.'

Whereas in 9–10 there is an implicit (but salient) argument fulfilling the thematic role of an external Causer whose reference is understood in discourse, in 53–54 there is no such argument. Thus, according to 54 Zhangsan can be excited for no reason or for unknown reasons, but according to 10 an external cause for Zhangsan's excitement is understood, so that the latter is better translated as '(It) got Zhangsan so excited that he couldn't speak a word.' Exx. 53–54 can be used to initiate a discourse, but 9–10 would be ill-formed if used in a situation where the implicit causer has no definite reference.

The fact that exx. 9–10 involve an implicit Causer suggests that the empty subject preceding V1 is not coindexed with the c-commanded *Zhāngsān*, but is instead a free zero pronoun referring to the understood Causer. If this is

[19] Mei 1981 has argued independently that the resultative expresses the perfectiveness of a given event. He also argues, among other things, that the perfective *-le* is in fact historically derived from a resultative complement.

correct, then these sentences do not constitute a problem for Binding Condition C, and a potential argument for the PP and against the SP hypothesis disappears. Independent evidence for this analysis of 9–10 comes from the fact that, if the understood external Causer is spelled out lexically, it occupies precisely the subject position preceding V1:

(55) *zhèpíng jiǔ zuì de* [*Zhāngsān zhàn-bù-qǐlái*].
this wine drunk DE Zhangsan cannot-stand-up
'This bottle of wine got Zhangsan so drunk that he couldn't stand up.'

(56) *zhèjiàn shì jīdòng de* [*Zhāngsān shuō-bù-chū huà lái*].
this event excited DE Zhangsan cannot-speak-out words come
'This event got Zhangsan so excited that he couldn't speak a word.'

As a possible objection to the claim that the empty subject in 9–10 refers to an external Causer but does not co-refer with the embedded subject, one might suggest that the Causer 'this bottle of wine' or 'this event' in 55–56 in fact occupies the topic position but not the subject position of these sentences.[20] This suggestion has the potential of enabling one to maintain that the empty subject position preceding V1 in 9–10 is still coindexed with *Zhāngsān*, thereby preserving an argument for the PP hypothesis. Actually, however, such a view is untenable. If 'this event' in 56 occupies the topic position followed by a subject **e** coindexed with *Zhāngsān*, then 56 should be semantically on a par with 57:

(57) *zhèjiàn shì, Zhāngsān*$_i$ *jīdòng de* [**e**$_i$ *shuō-bù-chū huà lái*].
this event Zhangsan excited DE cannot-speak-out words come
'As for this event, Zhangsan was so excited that he couldn't speak a word.'

But there is an important (though perhaps subtle) semantic difference between 56 and 57. In 57, the relationship between the topic and the comment is a vague 'as for' relationship. The topic need not be understood to be the Causer of Zhangsan's excitement; it might refer to something Zhangsan is excited about, and it may be that something or someone else (or he himself) has caused his excitement about the topic. But in 56 'this event' is directly understood to be the Causer of Zhangsan's excitement. The contrast between 56 and 57 suggests that even if 'this event' or 'that article' occupies the topic position in 56, it still binds the empty subject position before V1, rather than being loosely related to the comments by an 'aboutness relation' (as in 57). If so, then the empty subject before V1 is not coindexed with the NP before V2, and again there is no violation of binding principles.

There is considerable additional evidence for the subjecthood of the NP preceding V1. For example, in the following sentence the reflexive *zìjǐ* 'self'

[20] I am indebted to Tom Ernst for discussion of this point.

takes the pre-V1 NP as its antecedent:[21]

(58) (*tā zhěngtiān qí mǎ.*) e_i *bǎ zìjǐ$_i$ qí de mǎn-tóu-dà-hàn.*
he whole-day ride horse BA self ride DE sweat-all-over-head
'(He had been riding the whole day.) He got himself to ride until he had sweat all over his head.'

Given the well-known fact that the reflexive in Chinese must have a subject as its antecedent, it is clear that the empty category in 58 is a subject.[22]

Finally, the contrast between 53–54 and 55–56 is analogous to the clear contrast between 59 and 60:

(59) *tā xiào-sǐ le.*
he laugh-die ASP
'He died laughing.'

(60) *nǐ xiào-sǐ tā le.*
you laugh-die he ASP
'You caused him to die laughing.'

The subjecthood of the first NP in the transitive sentence 60 can be established quite simply by the fact that it can be deleted in an imperative or under an Equi verb:

(61) *bié xiào-sǐ rén le.*
don't laugh-die people ASP
'Don't cause people to die laughing.' (Don't be ridiculous.)

(62) *wǒ hái bù xiǎng* [PRO *xiào-sǐ tā*].
I still not want laugh-die he
'I still don't want to cause him to die laughing.'

In short, there is ample evidence that 9–10 each contain an implicit subject whose reference is distinct from *Zhāngsān*, and as such they do not constitute a binding theory violation under the SP hypothesis.

5.2. THE ANALYSIS OF CAUSATIVES. Sentences like 9–10 and 55–56 do raise a question about how such sentences are to be analyzed in a proper theory of thematic relations and phrase structure. In particular, note that predicates like *zuì* 'drunk' and *jīdòng* 'excited' are normally intransitives that take a single animate argument, the subject. So sequences like **zhèpíng jiǔ zuì-le wǒ* 'This bottle of wine got me drunk' are impossible.[23] The question is why in 55–56 such verbs take wines and events as their subjects and precede their 'logical subjects' (*Zhāngsān*). The following sentences, where the 'logical objects'

[21] This situation does not, of course, violate Condition C, since what we have here is an anaphor bound by a zero pronoun. What is relevant for us is simply that where the pre-V2 NP is a name or R-expression (as in 9 and 10), it is not coindexed with the pre-V1 NP, so that 9–10 do not constitute a violation of Condition C, and therefore present no problem for the SP hypothesis.

[22] For more discussion of the referential properties of Chinese reflexives, see Y.-H. Huang 1984 and Tang 1987.

[23] In Classical Chinese, certain intransitives of this sort do have a causative (and a noncausative) meaning, as in *jiǔ bù zuì rén, rén zì zuì* 'The wine doesn't get one drunk, but one gets drunk by oneself.'

occur as the subject of V1, pose a similar problem:

(63) *tāde huà tīng de* [*wǒ xīn-jīng-dǎn-zhàn*].
his word hear DE I tremble-with-fear
'His words caused me (after hearing them) to tremble with fear.'

(64) *zhèdun fàn chī de* [*Lǐsì yì-máo-bù-shèng*].
this meal eat DE Lisi one-dime-not-left
'This meal got Lisi completely broke (after eating it).'

The generalization that emerges from these sentences is that the causative meaning is available only from the combination of V1 and V2 as a whole, not from V1 or V2 alone. This generalization obviously also holds of verbal COMPOUNDS like *xiào-sǐ* 'laugh-die' exemplified in 59–60. In particular, the combination *xiào-sǐ* 'laugh-die' can mean either 'to laugh until one dies' (59) or 'to cause one to laugh until one dies' (60). However, *xiào* 'laugh' alone can only have a noncausative use.[24]

Recall also that the difference between 53–54 and 55–56 is parallel to that between 59 and 60. The predicate in 53, 'got so drunk as to be unable to stand up', is inchoative, and the argument *Zhāngsān* is the Experiencer. The predicate in 55 is causative, taking 'this wine' as Causer and *Zhāngsān* as Causee. Similarly, *xiào-sǐ* is inchoative in 59, taking an Experiencer, and causative in 60, taking a Causer and a Causee. Below are more causative examples, where the members of each pair do not differ semantically in any significant way.

(65) a. *nǐ qì-sǐ wǒ le.*
you angry-die I ASP
'You cause me to be angry to death.' (I.e., you piss me off.)

b. *nǐ qì de* [*wǒ bàn sǐ*].
you angry DE I half die
'You caused me to be so angry as to be half dead.'

(66) a. *zhèjiàn shì kū-hóng-le Lǐsì de yǎnjīng.*
this matter cry-red-ASP Lisi 's eyes
'This matter "cried-red" Lisi's eyes.' (I.e., this matter caused Lisi to cry until he got red eyes.)

b. *zhèjiàn shì kū de* [*Lǐsì de yǎnjīng hóng le*].
this matter cry DE Lisi 's eyes red ASP
(Same as (a).)

There are two SYNTACTIC differences, of course, between the (a) and (b) members here and between 59–60 and 53–56. The first is that *xiào-sǐ* 'laugh-die', *qì-sǐ* 'angry-die', and *kū-hóng* 'cry-red' are short enough to be treated as a word

[24] If used transitively, *xiào* can only mean 'to ridicule, laugh at', not 'to cause one to laugh':

(i) *tā xiào-le.*
he laugh-PERF
'He laughed.'

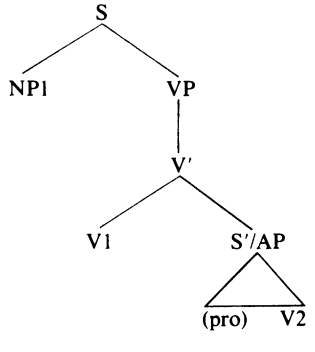
(ii) *wǒ xiào tā.*
I laugh he
'I laughed at him.'

(a V^0) each, whereas the predicates meaning '(cause to) become so drunk as to be unable to stand up' (as in e.g. 55) are long sequences that have to be treated as phrases. The other difference is that a short V1-V2 sequence may be directly followed by a Causee argument (as in the (a) sentences above and in 60), whereas a long V1-V2 sequence cannot. In the latter case, the Causee argument must occur either between V1 and V2 (as in the (b) sentences above and in 9–10 and 55–56), or else before the entire V1-V2 combination as subject of a passive sentence or as a preverbal object with the preposition *bǎ*:

(67) *wǒ bèi nǐ qì de bàn sǐ.*
I by you anger DE half die
'I am pissed off by you to half death.'

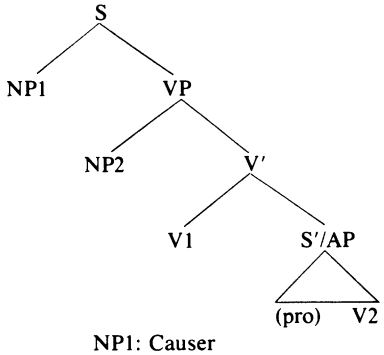
(68) *nǐ bǎ wǒ qì de bàn sǐ.*
you BA I anger DE half die
'You pissed me off to half death.'

Any theory that attempts to characterize sentences like 9–10 correctly in relation to their 'inchoative' counterparts must, therefore, capture: (a) the generalization that the causative meaning arises from the combination of V1 + V2 as a whole; (b) the semantic-thematic parallelism between lexical causativization (as in 60, 65a, and 66a) and phrasal causativization (as in 55–56, 65b, and 66b); and (c) the syntactic differences between them. To these ends I propose to analyze inchoative resultative constructions like 53–54 as having a D-Structure of the form in Fig. 4, and causative sentences like 9–10 and 55–56 as having a D-Structure of the form in Fig. 5.[25]



NP1: Agent/Experiencer
V1: Action/State
V2: Result/Extent

FIGURE 4.



NP1: Causer
NP2: Patient/Causee
V1: Action
V2: Result/Extent

FIGURE 5.

[25] The idea that certain resultative constructions are causatives is first due to Li Wang, who in his early work simply identified all resultatives as causatives. In Wang 1958, sentences having the form in Fig. 4 are (correctly) taken to be noncausatives. But since he seemed to assume that only those resultatives whose V1 is transitive are causative in meaning, his new definition of the causative construction was too narrow, excluding sentences like 9–10. My claim is that any resultative of the form represented by Fig. 5 is transitively causative, though not a sentence of the form in Fig. 4.

Fig. 4 differs from Fig. 5 in that in Fig. 4 the V′ (V-single-bar) is intransitive, whereas in Fig. 5 the V′ is transitive, having an object external to V′ but internal to VP. This distinction parallels that between an intransitive V^0 and a transitive V^0. So these D-Structures parallel those of sentences 59–60:

(69) [S *tā* [VP [V0 *xiào-sǐ*] *le*]].
he laugh-die ASP
'He laughed to death.'

(70) [S *nǐ* [VP [V0 *xiào-sǐ*] *tā* *le*]].
you laugh-die him ASP
'You caused him to laugh to death.'

The main difference between Figs. 4–5 and the structures 69–70 is that, whereas in the latter the V1-V2 combination makes up a V^0, in Figs. 4–5 it makes up a V′-phrase. One other difference between these structures is that whereas the object of V^0 follows the verb (as does *tā* 'him' in 70), the object of V′ precedes the V′ (as does NP2 in Fig. 5). I assume that Fig. 5 gives the right D-Structure position of the external object NP2, in conformity with the general word-order patterns of Chinese—in particular, the fact that the language is primarily head-final except for the lowest level of VP or PP expansion.[26] Abstracting away from this difference in the position of the object, the structures posited in Figs. 4–5 then parallel those of 69–70. The difference between Fig. 4 and Fig. 5 also parallels that between the D-Structures 69–70: it lies in whether an external argument has been 'internalized' by a Causer. Ex. 70 is a case of lexical causativization, whereby the addition of the Causer *nǐ* 'you' internalizes the subject of 69, *tā* 'he', making it a Causee in 70. Fig. 5 represents a case of phrasal causativization, which internalizes the NP1 of Fig. 4.[27] This analysis correctly captures an important observation of Li 1963 and Zhu 1982, who indicate that the NP immediately preceding V2 can be understood as the patient of the action denoted by the V1 + V2 combination, but often not as the subject of V2 (more on this below).

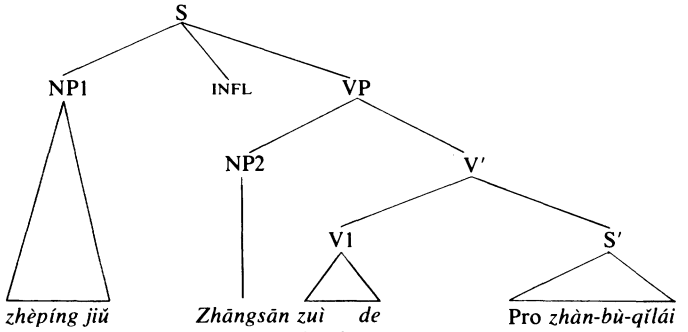
Consider now only the (transitive) causative structure. The D-Structure of 55, for example, is depicted in Fig. 6. The structure is on a par with that of 71:

[26] This explains why, in general, verbs and prepositions may each be followed by one constituent only, though they may be preceded by several constituents. For a fuller description of this particular aspect of Chinese word order, see Huang 1982. For further discussion and very interesting attempts to derive it from principles of the Government and Binding theory, see Koopman 1984, Travis 1984, and Li 1985.

[27] The internalization of an external argument from the structure in Fig. 4 into that in Fig. 5 seems to be a relatively recent development in the long history of the Chinese language. Mei 1986 cites extensive textual evidence showing that what is commonly used today as a (transitive) causative (e.g. *nì-sǐ* 'drown-die', *shāo-sǐ* 'burn-die') could only be used inchoatively in Archaic Chinese.

Incidentally, in some of the cases under discussion, one might adopt the 'unaccusative hypothesis' (Perlmutter 1978; cf. Burzio 1985) and assume that the subject of the intransitive is in fact the object of an unaccusative verb or V′ whose subject is expletive. The difference between 59 and 60 is not unlike that between *The window broke* and *John broke the window*. In such cases, of course, we do not speak of internalization, but only of the addition of an external argument.

(71) *zhèpíng jiǔ zuì-dǎo-le Zhāngsān.*
this wine drunk-fall-PERF Zhangsan
'This bottle of wine got Zhangsan so drunk that he fell.'



'This wine got Zhangsan so drunk that he couldn't stand up.'

FIGURE 6.

That is, in both Fig. 6 and ex. 71, *zhèpíng jiǔ* is the Causer, and *Zhāngsān* is the Experiencer/Causee. Since *zuì-dǎo* 'drunk-fall' is a zero-level category, it can assign Case to *Zhāngsān,* so the latter may occur directly after the whole compound in 71. However, since the theta-marker of *Zhāngsān* in Fig. 6 is a V′-phrase, it does not assign Case to this external object. One of the things that can happen to Fig. 6 is that the V1 may be moved into INFL, where it then assigns Accusative Case to *Zhāngsān,* assuming that Case-assignment is rightward in Chinese (following Li 1985, Koopman 1984, and Travis 1984). The result of V-raising is 72, the S-Structure representation for the phonetically identical 55:

(72) *zhèpíng jiǔ* [$_{INFL}$ *zuì de*]$_i$ [$_{VP}$ *Zhāngsān*
this wine drunk DE Zhangsan
[$_{V'}$ t_i [$_{S'}$ pro *zhàn-bù-qǐlái*]]].
can't-stand-up

V-movement is not the only way to allow *Zhāngsān* in Fig. 6 to have Case. Insertion of the preposition *bǎ* directly before NP2 also gives a good result:

(73) *zhèpíng jiǔ* [$_{VP}$ *bǎ Zhāngsān* [$_{V'}$ *zuì de* [$_{S'}$ pro *zhàn-bù-qǐlái*]]].
this wine BA Zhangsan drunk DE can't-stand-up

All the other causative sentences we have seen may have similar grammatical *bǎ*-forms. Still another way for NP2 to get Case is to move to the subject position of the entire sentence, where it gets Nominative, under passivization:[28]

[28] Sentence 67 in the text is another example of Case assignment under passive. Not all causatives may have a grammatical passive form, however. Some speakers do not accept 74, and sentences like 63–64 in the text cannot be turned into passives:

(i) **wǒ bèi tāde huà tīng de xīn-jīng-dǎn-zhàn.*
I by his words hear DE tremble-with-fear
'I was caused to tremble with fear by his words from hearing them.'

(74) *Zhāngsān*$_i$ *bèi zhèpíng jiǔ* [$_{VP}$ **t**$_i$ [$_{V'}$ *zuì de*
Zhangsan by this wine drunk DE
[$_{S'}$ pro *zhàn-bù-qǐlái*]]].
can't-stand-up
'Zhangsan was made so drunk by this wine that he couldn't stand up.'

Note that in 72 *Zhāngsān* does not occur in the subject position of the V2, *zhàn-bù-qǐlái* 'can't stand up', but in a position external to V′, where it controls the PRO subject of V2. It is this control relation that gives one the impression that *Zhāngsān* is the subject of V2, which led previous generative analyses to postulate a direct subject-predicate relationship between them (e.g. Huang & Mangione 1985, Mei 1978, Huang 1982, Tang 1977). According to earlier analyses, the NP is directly posited as the subject of V2 in D-Structure. 55 would have the structure 75:

(75) *zhèpíng jiǔ zuì de* [*Zhāngsān zhàn-bù-qǐlái*].
this wine drunk DE Zhangsan can't-stand-up

Under such an analysis, the *bǎ*-form 73 and the passive form 74 would be derived by moving *Zhāngsān* out of the lower clause, as an instance of subject-raising; the relation between the subject position of V2 and *Zhāngsān* is therefore one of movement. However, under the analysis proposed here it is a relation of control.

5.3. CONSEQUENCES. The analysis proposed here thus accounts for the essential facts concerning 9–10 and their inchoative counterparts in the following manner. First, in postulating D-Structures like Fig. 4 and Fig. 5, I have assumed that sentences like 9–10 are associated with hierarchical thematic grids (in the sense of Stowell 1981), whereby thematic roles are assigned compositionally—the external object by the V′-phrase as a whole, and the subject by the entire VP as a whole. This captures the generalization that the causative meaning (the presence of the external subject) is the result of compositional theta assignment by the V1 + V2 combination as a whole. Secondly, the parallelism between lexical causativization and phrasal causativization is captured by the assumption that sentences with inchoative or causative phrases are derived from structures identical to those for inchoative or causative compounds except for a difference in category-rank: V′ vs. V^0. Finally, the difference between lexical and phrasal causatives with respect to the position of the external object is derived from Case theory: in the case of a causative compound the object receives Case to the right of the compound, whereas in the case of a causative phrase V1 is raised to the left of the external object to assign Case to the latter.

An important feature of this analysis is the postulation of external objects

(ii) **Lisì bèi zhèdùn fàn chī de yì-máo-bù-shèng.*
Lisi by this meal eat DE one-dime-not-left
'Lisi was caused to be broke by this meal after eating it.'

In the active sentences 63–64 the subject is a Patient as Causer, semantically understood as the Patient of 'hear' and 'eat'. The fact that such sentences cannot be turned into the Passive is reminiscent of the 1-Advancement Exclusiveness Law of Relational Grammar.

within VP. This requires a slight enrichment of the theory of thematic grids so that, contrary to what is often assumed, there may be two or more than two external arguments in the thematic grid of a lexical item. This does not seem an undesirable result, and it is actually supported by other facts. For example, Belletti & Rizzi 1986 argue that sentences with psychological verbs have D-Structures in which both the internal and the external arguments originate in VP. Within Chomsky's 1986 extended X'-theory, the category VP should also have an external argument position, SPEC of VP. The 'external object' (NP2) postulated in Fig. 5 may be considered an instantiation of the SPEC of VP position. In English, several linguists have argued that the subject of a sentence originates as SPEC of VP but moves to the subject position under S (or IP) to get Case (Kuroda 1986, Fukui 1986, Koopman & Sportiche 1985, etc.). This movement is possible only where the SPEC of IP is expletive in D-Structure, since movement into a theta-position would lead to a violation of the Theta-criterion (Chomsky 1981). However, if there is another way to Case-mark the external argument in VP, movement to SPEC of IP need not occur, and the SPEC of IP can, in principle, have an independent theta-role. When both the SPEC of VP and the SPEC of IP have independent theta-roles, we have two external arguments within the thematic grid of a verb. This happens with *persuade*-type control sentences, as argued in Larson 1987. Larson adopts an early suggestion made in Chomsky 1955, assuming that at D-Structure *Bill* is the external object (i.e. SPEC of VP) of the sequence *persuade* PRO *to go* in 76, rather than an object of *persuade* alone:

(76) [$_{IP}$ *John* [$_{I^0}$ *-ed*] [$_{VP}$ *Bill* [$_{V'}$ *persuade* [PRO *to go*]]]]

In this structure, movement of *Bill* to the SPEC of IP position is ruled out. But *persuade* may be raised into INFL, where it then Case-marks *Bill,* giving *John persuaded Bill to go*. This is what I suggest also happens in Chinese causatives like 72.

The existence of an external object in VP is also supported by other facts. It is well known that in Chinese there are two kinds of 'compounds' that have the internal structure of [verb + object]. One kind of V + O compound may take a postverbal object:

(77) a. *Zhāngsān hěn zhù-yì zhèjiàn shì.*
Zhangsan very pay-attention this matter
'Zhangsan has paid much attention to this matter.'
b. *Zhāngsān hěn dān-xīn Lǐsì.*
Zhangsan very carry-heart Lisi
'Zhangsan is very worried about Lisi.'

But the other kind does not:

(78) a. **Zhāngsān* [*buō-pí*] *-le júzi.*
Zhangsan peel-skin-ASP orange
'Zhangsan peeled the orange.'
b. **wǒ* [*bǎng-piào*]*-le tā.*
I tie-ticket-ASP him
'I kidnapped him.'

Other examples of the latter class include *kāi-dāo* ('open-knife') 'operate on', *kāi-wánxiào* 'make fun of', *dǎ-ěrguāng* ('hit-ear') 'slap', *chī-chù* ('eat-vinegar') 'be jealous of'. The sentences in 78 are ill-formed not because they can take no objects, but because their objects must occur preverbally or between the verb and the internal object of the V + O combination:

(79) a. *wǒ bǎ tā bǎng-le piào.*
I BA him tie-ASP ticket
'I kidnapped him.'
b. *tā bèi wò bǎng-le piào.*
he by me tie-ASP ticket
'He was kidnapped by me.'
c. *wǒ bǎng-le tā piào.*
I tie-ASP him ticket
'I kidnapped him.'

The relationship between *tā* 'him' in these sentences to the combination *bǎng + piào* clearly parallels that between the postverbal objects of 77 and the compounds preceding them. This is why Chinese grammarians have described all of these V + O combinations as verb-object compounds. But why should the second group of V + O compounds disallow postverbal objects? The most plausible answer is that these V + O combinations are really V′ phrases which take external objects,[29] while those of the first group have evolved into genuine compounds. The D-Structure of the sentences in 79 is 80:

(80) [*wǒ*$_{I^0}$[$_{VP}$ *tā* [$_{V'}$ *bǎng-le piào*]]]
I him tie-ASP ticket

Since *bǎng-le piào* is a V′, it does not assign Case, so 78b is ill-formed. Case may be assigned to the external object under *bǎ*-insertion (as in 79a), or passivization (as in 79b), or under V-movement of *bǎng-le* to I^0 (as in 79c). Notice that the derivation of 79a–b parallels that of the causative sentences 73–74, and 79c parallels 72. The sentence 79c may be further converted to 81, where the external object has been reanalyzed as a genitive phrase of the NP headed by *piào* 'ticket', triggering insertion of the prenominal modifier marker *de*:

(81) *wǒ bǎng-le tā-de piào.*
I tie-ASP his ticket
'I kidnapped him.' (lit. I tied his ticket.)

Although *tā-de* 'his' now occurs as a SPEC of NP, it is not an element in the functional complex (argument structure) of the noun *piào* 'ticket'. It is a 'pseudo-possessive' phrase of the NP *tā-de piào*.

This analysis provides a straightforward explanation for an otherwise peculiar fact of binding. As observed in C.-R. Huang 1987, the genitive *tā-de* 'his' in 82 must be disjoint in reference from the subject *Zhāngsān*.

(82) *Zhāngsān bǎng-le tā-de piào.*
Zhangsan tie-ASP his ticket
'Zhangsan kidnapped him.'

[29] This is what Thompson 1973 already suggested, though she did not go beyond this point to explain the systematic differences between the two groups of 'compounds'.

In other contexts, genitive pronouns are in general not subject to this restriction: *Zhāngsān kànjiàn-le tā-de shū* 'Zhangsan saw his book' allows the pronoun to take *Zhāngsān* as its antecedent. (Cf. also *John pulled his leg.* vs. *John saw his book.*) This fact directly follows from our analysis, as a result of the hypothesis that the genitive NP in 82 is, prior to reanalysis, an external object of V′ and a clausemate of *Zhāngsān* when the relevant binding principle applies. This is parallel to a similar fact of causative sentences like 83, where disjointness is required between *tā* and *Zhāngsān*:

(83) *Zhāngsān kū de tā hěn shāngxīn.*
Zhangsan cry DE he very sad
'Zhangsan cried so much that he (not Zhangsan) became very sad.'

This again follows directly from the idea that *ta* is an external object of *kū de hěn shāngxīn,* at least when the disjoint reference principle applies.[30]

Another piece of evidence for our analysis comes from the occurrence of sentences where NP2 clearly does not belong to the functional complex of V2. In early Mandarin and in the speech of many northern Mandarin speakers, examples of the following kind are well attested:

(84) *Zhāngsān pīpíng de wǒ zuì xiōng.*
Zhangsan cricitize DE I most fiercely
'Zhangsan criticized me most fiercely.'

(85) *Cuīníng yì-lù mǎi jiǔ mǎi shí, fèngchéng de tā hǎo.*
Cuining one-way buy wine buy food please DE he well
'Cuining$_1$ bought wine and food all the way, and pleased him$_2$ well.'

In 84 *wǒ* 'I' clearly does not participate in the argument structure of 'most fiercely', and in 85 'he' and 'well' do not form a clause. In both cases, the NP can be interpreted as the external object of the V′ meaning 'criticized fiercely' or 'pleased well' in accordance with our analysis, but would pose important difficulties for an analysis that takes NP2 as the subject of V2 at D-Structure.[31]

Secondary Predication

6. We have seen that all three arguments that have been produced for the PP hypothesis turn out not to support that hypothesis, and that the facts that they turn on can be plausibly accounted for in a way consistent with the traditional SP hypothesis. Now I turn to some positive arguments in favor of this latter hypothesis.

The first argument has to do with backward anaphora in Chinese. In Huang 1982 it is shown that an overt pronoun cannot occur as the possessive of an

[30] The disjoint reference requirement in 83 can be accounted for in a framework that takes *tā* as the subject of V2 at D-Structure. This can be done with S′-Deletion, from which disjoint reference follows, exactly as in *John believes him to be honest.* But the S′-Deletion account does not extend to sentences like 82 or English sentences like *John pulled his leg.*

[31] As suggested by Mei 1987, it is possible that in a DERIVED STRUCTURE the NP2 does occur in the subject position of V2 (yet another position where it can get Case). This would then be a case of a 'pseudo-subject', echoing the occurrence of the 'pseudo-possessive' phrases that we saw in 81.

NP c-commanding its antecedent (as in 86–87), but can be the possessive of the subject NP of an adverbial clause or sentential subject (as in 88–89):

(86) **tāde$_i$ mèimei hěn xǐhuān Zhāngsān$_i$.*
his sister very like Zhangsan
'His sister likes Zhangsan.'

(87) **tāde$_i$ mèimei shuō Zhāngsān$_i$ shuì-zháo le.*
his sister say Zhangsan sleep-on ASP
'His sister said that Zhangsan was asleep.'

(88) *tāde mèimei yì huí dào jiā, Zhāngsan jiù kū.*
his sister once return to home Zhangsan then cry
'As soon as his sister arrived home, Zhangsan started to cry.'

(89) *tāde mèimei méi dé jiǎng shǐ Zhāngsān hěn shēngqì.*
his sister not get prize make Zhangsan very angry
'That his sister did not get a prize made Zhangsan very angry.'

As argued in Huang 1982, the difference between 86–87 and 88–89 can be captured by reference to the relative height of the pronoun in relation to its antecedent. In 86–87, the NP which immediately contains the pronoun 'his' c-commands the antecedent, but in 88–89 the pronoun is one step further embedded, since the NP immediately containing the pronoun 'his' c-commands only the rest of the sentential subject or adverbial clause, but does not c-command the antecedent *Zhāngsān*.[32] Now, consider a resultative sentence like 90:

(90) *tāde mèimei qì de Zhāngsān zhí fādǒu.*
his sister angry DE Zhangsan straight tremble
a. 'His sister was so angry that Zhangsan trembled all over [with fear].'
b. 'His sister caused Zhangsan to be so angry that he trembled all over [with anger].'

This sentence is grammatical with two meanings, but only with the interpretation that 'his sister' does not refer to Zhangsan's sister. Now, according to the PP hypothesis, this fact is unexpected, since 'his sister' would be the subject of an adverbial exactly as it is in 88, or the subject of a sentential subject as

[32] The relative well-formedness of 88-89 can be brought out more clearly if the sentences are compared to those in which 'his sister' is replaced by 'he'. So, for example, in contrast to 89, (i) does not permit referential dependence of *tā* 'he' on *Zhāngsān*:

(i) *tā méi dé jiǎng shǐ Zhāngsān hěn shēngqì.*
he not get prize make Zhangsan very angry
'That he didn't win the prize made Zhangsan very angry.'

In this sentence the pronoun is less deeply embedded than in 89. My point here is that although embedding a pronoun as the possessive of a subordinate clause subject makes coreference possible (as in 88-89), embedding it as the possessive of a main clause subject does not (since 86-87 are no better than those in which 'his sister' is replaced by 'he'). The relevant restriction that was proposed in Huang 1982 to account for this range of facts is that an overt pronoun cannot 'cyclic-c-command' its antecedent. Roughly, in our examples, α cyclic-c-commands β if and only if the minimal cyclic category containing α c-commands β. For an improvement along similar lines, see Teng 1985. It should be added that there are speakers who do not even accept the coreference reading of 88-89 and cannot distinguish between 86-87 and 88-89. For such speakers, of course, this argument does not obtain.

it is in 89. The SP hypothesis correctly predicts this pattern, however, since 'his sister' would be a main clause subject c-commanding *Zhāngsān* as it does in 86–87. The facts surrounding 86–89 concerning backward pronominal anaphora thus provide a positive argument for our hypothesis.

A second argument is available from facts concerning the scope of negation and questions. In the foregoing discussion we saw that, although V1 in a descriptive or resultative construction cannot be directly preceded by *bù* or itself occur in A-not-A form, pre-V1 negation or questioning is possible if there is a 'supporting' element like *yǒu* 'have', *shì* 'be', and *néng* 'can'. The relevant examples are 30–31, repeated below:

(30) a. *tā méi-yǒu pǎo de hěn kuài.*
he not-have run DE very fast
'He did not run fast.'

b. *tā bù-shì pǎo de hěn kuài.*
he not-be run DE very fast
'It is not the case that he runs fast.'

c. *tā bù-huì pǎo de hěn kuài.*
he not-will run DE very fast
'He will not run fast.'

(31) a. *tā yǒu-méi-yǒu pǎo de hěn kuài?*
he have-not-have run DE very fast
'Did he run fast?'

b. *tā shì-bù-shì pǎo de hěn kuài?*
he be-not-be run DE very fast
'Is it the case that he runs/ran fast?'

c. *tā néng-bù-néng pǎo de hěn kuài?*
he can-not-can run DE very fast
'Can he run fast?'

In each of these sentences, the scope of the negation or A-not-A element extends over the entire string to its right including, in particular, V2.[33] Given the standard assumption that scope is determined by c-command, this fact is consistent with the SP hypothesis, because in each case the negation or A-not-A morpheme appears in main clause INFL, where it c-commands both V1 and V2; but it is inconsistent with most versions of the PP hypothesis. In particular, the sequences *tā méi-yǒu pǎo de* in 30a or *tā yǒu-méi-yǒu pǎo de* in 31a (and similar sequences) cannot be analyzed as a sentential subject or adverbial clause below V2 in accordance with the PP theory, because in that case the relevant negative or interrogative element c-commands only V1 but not V2.[34]

Thirdly, there is also evidence for this analysis derivable from a fairly well known constraint on VP structure in the language. As described in Huang 1982, this constraint prevents a Chinese VP from containing, in postverbal position,

[33] This is reflected in the English translations. That the scope of negation extends over the entire string to its right is also evidenced in the following sentence:

(i) *tā méi-yǒu pǎo de bǐ rènhé rén kuài.*
he not-have run DE than any person fast
'He doesn't run faster than anybody.'

Here the negative polarity item 'anybody' is clearly affected by the negation, as it is interpreted existentially.

[34] See also Li 1985 for a similar argument for the SP analysis.

both an INNER COMPLEMENT such as an object and an OUTER COMPLEMENT such as a resultative or descriptive expression or a frequency or duration phrase. The following examples are ill-formed because they contain such structures:

(91) a. **tā niàn shū de hěn kuài.*
he read book DE very fast
b. **tā niàn shū de hěn lèi.*
he read book DE very tired
c. **tā niàn shū le sānge zhōngtóu.*
he read *book* ASP three hours
d. **tā niàn shū le liǎng cì.*
he read book ASP two times

These sentences can be saved if the direct object 'book' (the inner complement) is preposed or otherwise removed from postverbal position. Another way to save the sentences is to reduplicate the verb after the direct object, so that only one sort of complement follows the verb at a time.

(92) a. *tā niàn shū niàn de hěn kuài.*
he read book read DE very fast
'He reads books fast.'
b. *tā niàn shū niàn de hěn lèi.*
he read book read DE very tired
'He read books until he got tired.'
c. *tā niàn shū niàn le sānge zhōngtóu.*
he read book read ASP three hours
'He read books for three hours.'
d. *tā niàn shū niàn le liǎng cì.*
he read book read ASP two times
'He read books twice.'

There are a number of other facts apparently related to this constraint, construed in Huang 1982 as a descriptive generalization.[35] A crucial aspect of this constraint is that it applies specifically to VP syntax, in particular to postverbal elements in VP. Crucially, there is no similar restriction that necessitates verb reduplication following a sentential subject or an adverbial adjunct:

(93) [*tā kàn zhèběn shū*] (**kàn*) *bù hǎo.*
he read this book read not good
'That he reads this book is not good.'
(94) *tā yòng gùnzi* (**yòng*) *dǎ-le rén.*
he use stick use hit-PERF person
'He hit someone with a stick.'

[35] It is doubtful that such a constraint has an independent theoretical status. Koopman 1984, Travis 1984, and Li 1985 have shown that part of what the constraint covers may be derived from Chomsky's 1981 Case theory and Theta theory coupled with a parameter of the directionality of Case- or theta-assignment. The remainder might be derived in a modular manner from other sources. Ernst 1986 suggests that the reduplication in descriptive and resultative constructions may be explained by the assumption that the particle *de* must be cliticized to a verb. But this explanation does not account for the similar facts in frequency and duration constructions like 91c–d and 92 c–d, or for the ungrammaticality of **tā niàn-le shū liǎng cì*, for 'S/he read the books twice'.

This means that both the descriptive and the resultative phrases (each containing V2 in the relevant examples) must be construed as postverbal elements with respect to V1, in accordance with the SP hypothesis. A PP analysis in terms of any of the structures in Fig. 1 would not be able to capture this constraint.

The SP hypothesis receives additional evidence from the ambiguity of sentences like 95 (due to Zhu 1982):

(95) *tā zhēng de hěn làn.*
he steams DE very soft
(a) 'He steamed (it) very soft.'
(b) 'What he steamed is very soft.'

This fact argues against Chao's 1968 PP analysis, according to which 95 has one single structure: the sequence *tā zhēng de* is analyzed as a free relative functioning as the subject of the entire sentence, and *hěn làn* is the main verb. However, since each lexical element in 95 is lexically unambiguous, it is wrong to give the sentence only one structural analysis, with the nominalizing *de* and the resultative *de* identified as one and the same particle. According to the SP analysis, on the other hand, 95 has two structures. In one structure *de* is a nominalizer marking the preceding sequence as a free relative clause subject, and the sentence has the meaning 95b, with 'very soft' being the main verb. In the other structure 'very soft' is a secondary predicate and 'steam' is the main verb, and the sentence has the meaning 95a. The ambiguity of 95 thus argues for the SP analysis.[36]

Finally, there is an important piece of phonological evidence for the SP analysis, due primarily to Chen's 1986 work on Xiamen (Amoy) tone sandhi. Chen observes that Xiamen sentences like the following are ambiguous in their written form:

(96) *i cao kha kin.*
he run more fast
a. 'He runs faster.'
b. 'It would be faster for him to run.'

In spoken form, however, the sentence is not ambiguous. If the V1 'run' is spoken with a sandhi tone (phonetically high even), the sentence means 'He runs faster' (96a), but if it is spoken with a citation tone (phonetically high falling), then it means 96b. Why does tone sandhi happen in one case but not

[36] One might try to maintain the PP analysis for 95 by claiming that it has only one surface structure (a free relative as its subject taking 'very soft' as its main verb) and that the ambiguity arises because the empty head of the free relative can refer to 'the thing' or 'the extent'. In other words, 95 might be the result of deleting the head of a relativized NP from two possible D-Structures, meaning either 'The thing that he steamed is very soft' (i.e. 95b), and 'The extent to which he steamed (it) is very soft' (i.e. 95a). However, this assumption is untenable in view of the widely accepted principle of recoverability of deletion. Although a free relative may in general be formed by deleting a head if an NP ARGUMENT is relativized, such a process is impossible if an ADJUNCT is relativized. Thus, both *mǎi shū de* 'the person who bought the book' and *wǒ mǎi de* 'the thing which I bought' are well formed, but sequences like **wǒ mǎi shū de* or **wǒ lái de* (intended for 'the time I bought the book' or 'the means by which I came') are not.

the other? There is sufficient evidence (from Chen 1986, Cheng 1973) that the single most important principle governing the applicability of tone sandhi in this language is that a major phrase boundary blocks the immediately preceding tone from undergoing tone sandhi. This argues strongly for the hypothesis that 96 has the two structures given in Fig. 7, corresponding to the two meanings. That is, 96a has a structure of secondary predication where the main verb *cao* 'run' is not immediately followed by a major phrasal boundary, but 96b has a structure of primary predication where *cao* appears at the end of a sentential subject taking 'faster' as its main verb. The SP hypothesis must be correct, then, for the reading 96a.

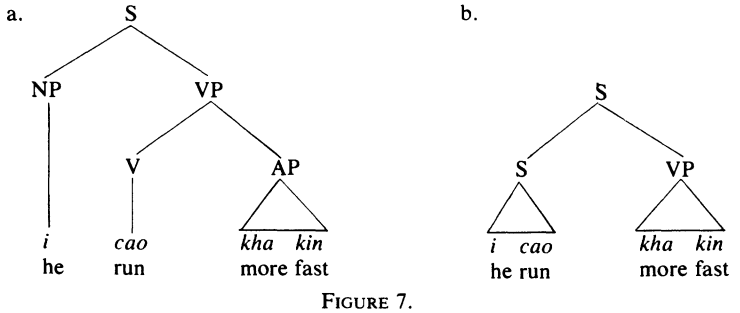


FIGURE 7.

Chen's argument from Xiamen can be duplicated in Mandarin by reference to the well-known rule of Third Tone Sandhi, which changes a third tone into a second tone in the environment of a following third tone. As shown in Shih 1985, the DOMAIN of this rule is limited by syntactic and certain prosodic factors. According to Shih, the tone sandhi rule need not apply across a subject-predicate boundary, though in VP-internal position the rule must apply regardless of the tempo of speech. Now, the following sentence, with an underlying tone sequence 1 3 3 4, must be spoken with the tone pattern 1 2 3 4 under the meaning 97a, though this change of the first tone 3 into tone 2 is optional in the case of 97b:

(97) *tā pǎo hěn kuài.*	Underlying tone sequence:
he run very fast	/1 3 3 4/
a. 'He runs very fast.'	Surface tone sequence:
	[1 2 3 4]; *[1 3 3 4].
b. 'For him to run is fast.'	Surface tone sequence:
	[1 3 3 4]; [1 2 3 4].

It seems, then, that all the available evidence we have favors a traditional analysis of 1–3 according to which V1 rather than V2 is the main verb.

SUMMARY

7. In this paper I have juxtaposed two well-known hypotheses about the phrase structure of descriptive and resultative constructions, and concluded that the traditional hypothesis taking V1 to be the main verb is more nearly correct. I reviewed three arguments that have been produced for the hypothesis

that V2 is the main verb; these turn on (a) the distribution of A-not-A questions and *bù*-negation, (b) the distribution of the *-le* suffix, and (c) the occurrence of sentences which appear to violate a general principle of binding. These facts were shown not to provide a cogent argument for the PP hypothesis, however, as in each case the facts have an explanation consistent with the traditional SP hypothesis. Finally, a number of other arguments were added in support of SP.

On the more substantive side, what this paper has done is offer an analysis for a number of facts that are interesting both in their own right and because they seem to present problems for the analysis of descriptive and resultative constructions. Except for *-le* suffixation, furthermore, it seems that these facts may find a unified explanation in terms of V-movement. Assuming that the negative marker *bù* is properly contained in INFL and that it must be attached to the first following V, V-movement explains why V1 cannot be negated by *bù* or occur in A-not-A form. It also enables one to derive *yǒu-le* alternation in a desirable way. In addition, V-movement creates causative structures like 9-10, explaining away an apparent counterexample to Binding Theory and capturing a heretofore unnoticed difference between such causative sentences and their noncausative counterparts.

The phrase structure of constructions considered here is an important issue, because each analysis has consequences that extend over the rest of the grammar. The issue is important for a proper understanding, not only of Mandarin and other Chinese languages, but also of other (unrelated) languages in Asia and elsewhere. The degeneracy of overt inflectional markings of verbs and other morphological clues in such languages makes the problem of identifying the main verb an especially interesting one—precisely because the answer is not at all obvious. The two hypotheses discussed here represent the various criteria that linguists have come up with in an attempt to approach the question. What I have argued in this paper is that proponents of Primary Predication have drawn upon the wrong criteria for an answer, and that an analysis in terms of Secondary Predication is more likely to be right.

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