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Reconstruction and the Structure of VP: Some Theoretical Consequences

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# Reconstruction and the Structure of VP: Some Theoretical Consequences

## 1 Introduction

It is well known that certain sentences that have had their constituents reordered under Move  $\alpha$  behave with respect to binding theory as though movement had not taken place. In current literature, such sentences are known as examples of *reconstruction*. This term derives from Chomsky's (1976) treatment of sentences like (1).

- (1) \*[Whose<sub>i</sub> mother]<sub>j</sub> does he<sub>i</sub> love t<sub>j</sub>?

This sentence is apparently a case of strong crossover and should presumably be ruled out by Principle C of the binding theory, but in (1) no R-expression is actually A-bound. Chomsky's proposal was that the phrase *whose mother* is reconstructed to its base position as in (2a) or equivalently (2b), so that the pronoun *he* does c-command a trace of *who*, and the impossibility of coindexing *he* with *whose* follows from Principle C, as a standard case of strong crossover.

- (2) a. For which  $x$ ,  $x$  a person, he loves  $x$ 's mother?  
b. Who<sub>i</sub> does he love t<sub>i</sub>'s mother?

The following sentences exhibit reconstruction effects with respect to Principle A:

- (3) a. Which pictures of himself did John like t?  
b. Which pictures of himself did John think Bill saw t?  
c. Which pictures of himself did John think Mary saw t?  
d. Which pictures of herself did John think Mary saw t?

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(3a) is well formed in spite of the fact that the reflexive is not c-commanded by its antecedent *John*. (3b) is well formed and ambiguous, indicating that either the matrix subject or the embedded subject may be the antecedent of the reflexive, a fact independently confirmed by the well-formedness of both (3c) and (3d). But in all these sentences the reflexive is not A-bound. Sentences with the reciprocal anaphor exhibit the same pattern:

- (4) a. Which friends of each other did they talk to *t*?  
 b. Which friends of each other did they say that we should talk to *t*?  
 c. Which friends of each other did they say that I should talk to *t*?  
 d. Which friends of each other did he say that we should talk to *t*?

It is useful to note that the ambiguity of (3b) and (4b) arises only by virtue of the fact that movement has taken place; with the relevant phrases in their D-Structure position the anaphors can only be bound within the embedded clause:

- (5) a. They said that  $we_i$  should talk to friends of each other $_i$ .  
 b. \*They said that I should talk to friends of each other.

This shows that the relevant binding facts cannot be accounted for by having binding theory apply (only) at D-Structure.<sup>1</sup> The correct descriptive generalization seems to be that binding by an NP is possible just in case there is a movement site to which a given anaphor may be "reconstructed" and from which it may be bound by the NP in accordance with the locality requirement of Principle A. Thus, the ambiguity of (4b) arises from the fact that the sentence has two possible "reconstruction sites," marked by the initial trace and the intermediate trace of successive movement:

- (6) [Which friends of each other] $_i$  did they say [ $t_i$  that [we should talk to  $t_i$ ]]?

Reconstruction to the position of the initial trace gives rise to the construal corresponding to (5a), and reconstruction to the position of the intermediate trace allows *each other* to be bound by the matrix subject in accordance with the locality requirement of Principle A, on a par with a sentence like (7).<sup>2</sup>

- (7) They $_i$  wondered which friends of each other $_i$  we should talk to *t*.

<sup>1</sup> Or the NP-Structure level proposed by Van Riemsdijk and Williams (1981), the level at which NP-movement has taken place but *wh*-movement has not.

<sup>2</sup> In the literature, two main approaches to the reconstruction phenomenon have been proposed. On the one hand, it has been proposed that a displaced phrase is literally put back to a previous movement site, as in Chomsky's (1976) treatment of certain cases. A variation of this approach is to assume the principles of binding theory to be "anywhere" principles that can be satisfied at any point by the level of S-Structure (see Belletti and Rizzi 1988). On the other hand, Barss (1986) has argued that reconstruction is best dealt with at S-Structure, by means of the notion "chain-accessibility," according to which anaphors in sentences like those in the text count as being bound by their antecedents as long as they are, to simplify somewhat, contained in a phrase whose trace is locally c-commanded by the antecedent. The choice between these two approaches is not without important consequences, but it will be largely irrelevant for the purposes of this article. Throughout this work, the term *reconstruction* will be used to refer to the phenomenon, as a descriptive label only.

Reconstruction of Principle B effects is illustrated by sentences like those in (8) and (9). The (a) examples are ruled out on a par with their (b) counterparts.

- (8) a. \*How many pictures of  $him_i$  did John $_i$  take?  
 b. \*John $_i$  took many pictures of  $him_i$ .  
 (9) a. \*With  $him_i$ , John $_i$  never talked.  
 b. \*John $_i$  never talked with  $him_i$ .

The effects of all three binding principles are thus reconstructable as far as the binding properties of an overt anaphor, pronoun, or R-expression are concerned. The binding requirement on an NP-trace may likewise be satisfied under reconstruction:

- (10) a. How likely  $t_i$  to win is John $_i$ ?  
 b. How certain  $t_i$  to win is John $_i$ ?

On the other hand, it has been observed (e.g., Saito 1991) that the need for a *wh*-trace to be  $\bar{A}$ -bound may not be satisfied in the same way. Thus, although the D-Structure representation in (11a) may be turned into the marginally acceptable (11b), it cannot be turned into the impossible (11c).

- (11) a. You wonder [which pictures of who] are on the table.  
 b. ??Who $_i$  do you wonder [<sub>CP</sub>[which pictures of  $t_i$ ]<sub>j</sub> [<sub>IP</sub>  $t_j$  are on the table]]?  
 c. \*[Which pictures of  $t_i$ ]<sub>j</sub> do you wonder [<sub>CP</sub> who $_i$  [<sub>IP</sub>  $t_j$  are on the table]]?

The binding requirement on a *wh*-trace is one of  $\bar{A}$ - or variable binding (or ‘‘Proper Binding’’ in May 1977), and this differs from the A-binding requirement on an NP-trace. It thus seems that movement structures do not exhibit reconstruction effects with respect to the principle of variable binding. In contrast, reconstruction effects are generally available with respect to all principles of A-binding, when a constituent is  $\bar{A}$ -moved.<sup>3</sup>

<sup>3</sup> This difference between A-binding and variable binding stands in the way of any attempt to fully generalize A-binding across  $\bar{A}$ -binding, as is proposed in Aoun’s (1985) theory of generalized binding. According to this theory, A-binding and  $\bar{A}$ -binding are taken to be instances of ‘‘X-binding,’’ but it remains true that the conditions under which an element can be A-bound must be distinguished from those under which it may be  $\bar{A}$ -bound.

Note that although  $\bar{A}$ -movement structures exhibit a full range of reconstruction effects, the situation is quite different with A-movement structures. For example, Principle C effects are clearly not reconstructable under A-movement, as the following contrasts show:

- (i) a. \*It seems to  $him_i$  that the claim that John $_i$  overslept is false.  
 b. The claim that John $_i$  overslept seems to  $him_i$  to be false.  
 (ii) a. \*He $_i$  is surprised by the pictures of John $_i$ .  
 b. The pictures of John $_i$  surprise  $him_i$ .

On the other hand, it has been claimed that the effects of Principle A may be preserved under A-movement. Belletti and Rizzi (1988) argue, on the basis of Postal’s (1971) analysis of psych-movement, that the following sentences exhibit reconstruction effects with respect to Principle A:

- (iii) a. Pictures of each other surprised the men.  
 b. Those pictures of himself never pleased John.  
 c. Those gossips about himself never bothered John.

It has also been observed that there is a contrast between the (a) and (b) sentences in (iv) and (v), indicating

This general availability of reconstruction effects under  $\bar{A}$ -movement is not without exceptions. First, the effects of Principle C may disappear or become considerably weakened when a given R-expression is “sufficiently” deeply embedded:<sup>4</sup>

- (12) a. \*Whose<sub>i</sub> mother does he<sub>i</sub> love t?  
 b. ??Which pictures of John<sub>i</sub> does he<sub>i</sub> like most t?  
 c. ?Which claim that John was a thief did he deny t?  
 d. Which pictures that John took does he like most t?

Second, in contrast to cases like (10), the binding effects of an NP-trace do not reconstruct when the antecedent is an expletive or an idiom chunk. Contrasts of the following kind were first noted by Kroch and Joshi (1985):<sup>5</sup>

- (13) a. John is very likely t to win.  
 b. How likely t to win is John?  
 c. How likely is John t to win?

that Principle A can be satisfied under reconstruction in the (a) sentences, which involve raising, but not in the (b) sentences, where no movement is involved.

- (iv) a. ??Parents of each other seem to them [t to be brave].  
 b. \*Parents of each other told them [PRO to be brave].  
 (v) a. ??The clones of each other seem to the men [t to be polite].  
 b. \*The clones of each other told the men [PRO to be polite].

The claims are controversial, however. (See Pesetsky 1987 and Mahajan 1990 for different views.) In this article the discussion will be limited to reconstruction effects of  $\bar{A}$ -movement only.

<sup>4</sup> Reinhart (1981) conjectures that the relevant factor concerns the depth of embedding of the antecedent contained in the  $\bar{A}$ -phrase. Chomsky (1989) shows that a complement-adjunct asymmetry of the kind observed by Johnson (1987) may play a role in determining what constitutes “sufficient depth” of embedding. The latter generalization makes the required distinction between (12c) and (12d), and between (ia) and (ib).

- (i) a. ??Which pictures of John does he like most t?  
 b. Which pictures near John does he like most t?

These distinctions are reminiscent of the following kind observed by Johnson (1987):

- (ii) a. They bought pictures of each other.  
 b. ??They bought pictures near each other.  
 (iii) a. They read proofs that pictures of each other had been forged.  
 b. \*They read theorems that books about each other explained.  
 (iv) a. They believe the claim that pictures of each other are on sale.  
 b. \*They believe the claim that pictures of each other refute t.  
 (v) a. The claim that pictures of each other were on sale, they heard over the radio.  
 b. \*The claim that pictures of each other refuted t, they heard over the radio.  
 (vi) a. They ought to concede in court that pictures of each other prove their guilt.  
 b. \*They ought to concede in court the fact that pictures of each other demonstrate.

<sup>5</sup> Lasnik and Saito (1992) propose to attribute the ill-formedness of (14b) and (15b) to the fact that their NP-traces are not properly bound, thus subjecting NP-traces also to the Proper Binding Condition. On the other hand, the grammatical (13b) is allowed, under the hypothesis that its trace is in fact a PRO. That is, *likely* can be analyzed as a control predicate in (13b), so the sentence would mean ‘How much of a chance PRO to win does John have?’ However, a difficulty arises with predicates like *certain*, as in (10b). It is well known that *certain* is a raising predicate in (i), but a kind of “control” predicate in (ii).

- (i) John is certain t to win.  
 (ii) John is certain that he will win.

That is, in (i) the speaker is certain that John will win, but in (ii) John himself is certain that he will win. A “control” analysis would be appropriate for (ii) if the pronoun *he* is bound by *John*, but such an analysis

- (14) a. There is likely *t* to be a riot.  
 b. \*How likely *t* to be a riot is there?  
 c. ?How likely is there *t* to be a riot?
- (15) a. Advantage is likely *t* to be taken of John.  
 b. \*How likely *t* to be taken of John is advantage?  
 c. ?How likely is advantage to be taken of John?

Third, the possibilities of reconstruction may differ depending on the kind of  $\bar{A}$ -movement involved. In particular, Chomsky (1989) has observed that VP-movement exhibits a narrower range of reconstruction possibilities than *wh*-movement of a noun phrase. Recall that in sentences like (3b) and (4b) either the matrix or the embedded subject can be the antecedent of the anaphor. This ambiguity disappears, however, in the case of VP-fronting:

- (16) a. Which pictures of himself did John think Bill saw *t*? (= (3b))  
 b. Criticize himself, John thought Bill would not *t*.
- (17) a. Which friends of each other did they say that we should talk to *t*? (= (4b))  
 b. Talk to friends of each other, they said we should not *t*.

In (16b) and (17b) the anaphor is unambiguously bound by the embedded subject, but not by the matrix subject. In other words, descriptively speaking, it seems possible to reconstruct a VP to its D-Structure position, but not to an intermediate Spec position. This restriction is further illustrated by the following contrasts in grammaticality:

- (18) a. Which pictures of himself did John think Mary saw *t*? (= (3c))  
 b. \*Criticize himself, John thinks Mary would not *t*.
- (19) a. Which friends of each other did they say that I should talk to *t*? (= (4c))  
 b. \*Talk to friends of each other, they said I should not *t*.

Certain questions arise from contrasts of the kind observed in (16)–(19). In particular, what is the nature of the contrasts observed? What explains them? And what are the consequences of these contrasts and their explanation for the theory of grammar? In the following sections I take up these questions in turn. In section 2 I examine the contrasts in more detail and indicate the generality of the problem. In section 3 I show that the relevant contrasts follow straightforwardly from general principles of grammar in conjunction with the Internal Subject Hypothesis proposed in a number of important works (Kuroda 1988, Fukui and Speas 1986, Kitagawa 1986, Koopman and Sportiche 1985, 1988, Contreras 1987). In section 4 I extend the same analysis to explain a somewhat

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would be inappropriate for (i) since it would fail to distinguish (i) from (ii). More relevant is the fact that the same contrast holds between (iii) and (iv).

- (iii) How certain *t* to win is John?  
 (iv) How certain that he will win is John?

That is, in (iii) the addressee is presumed by the speaker to be certain that John will win, whereas in (iv) John is presumed by the speaker to be certain that he will win. A control analysis of (iii) would fail to make the necessary distinction between (iii) and (iv).

different range of facts in Chinese. The proposed analysis has several important implications, concerning certain current views with respect to the Internal Subject Hypothesis, the structure of VP, the syntax of scope, the nature of subject extraction, and the existence of V'-movement in certain Germanic languages. I indicate and discuss these implications in section 5. Section 6 is a brief summary.

## 2 VP-Fronting and Reconstruction

What is the difference between VP-fronting and *wh*-questions that gives rise to their contrasting reconstruction possibilities? One possible answer could be that they involve two different kinds of  $\bar{A}$ -movement. For example, it might be that, whereas *wh*-questions are formed by genuine *wh*-movement (i.e., movement to Spec of CP), VP-fronting might be achieved by adjunction, and there might be some principled differences in reconstruction possibilities between these two modes of movement. Another conceivable answer is that the difference lies in whether a *wh*-phrase or a non-*wh*-phrase is moved. Neither answer seems to capture the correct generalization, however. For one thing, the following examples show that topicalization contrasts with VP-fronting in the same way that *wh*-questions do:

- (20) a. Those pictures of himself<sub>i/j</sub>, John<sub>i</sub> thinks Bill<sub>j</sub> will buy t.  
 b. Criticize himself<sub>\*i/j</sub>, John<sub>i</sub> thinks Bill<sub>j</sub> will not t.

In (20a) the topicalized NP has two reconstruction possibilities, but in (20b) the fronted VP has only one. If Lasnik and Saito (1992) are correct in their claim that topicalization involves adjunction, then the distinction between substitution (into Spec of CP) and adjunction clearly does not play a role here. Furthermore, the distinction between *wh*-phrases and non-*wh*-phrases also plays no role, since in both cases here the fronted phrases are non-*wh*-phrases. The point is further confirmed by sentences of the following sort, pointed out by Barss (1986) and Hasegawa (1983) (who attributes the observation to Joan Bresnan), which involve the movement of an adjectival *wh*-phrase:

- (21) a. How proud of himself<sub>\*i/j</sub> does John<sub>i</sub> think Bill<sub>j</sub> will be?  
 b. How proud of himself do you think John should be?  
 c. \*How proud of yourself do you think John should be?

Since these sentences involve the movement of a *wh*-phrase, and therefore substitution into the Spec of CP, neither a difference in landing site nor a difference in *wh*-features can be responsible for the differences in reconstruction possibilities we have observed. The correct generalization, as pointed out by Barss, is that whenever a *predicate* is moved, it displays a pattern of reconstruction possibilities more limited than those displayed when an argument is moved. In particular, regardless of how far a predicate has moved, it must always reconstruct to its D-Structure position, whereas a moved argu-

ment can reconstruct to any position it has gone through.<sup>6</sup> The predicate-argument distinction is reflected in the following minimal contrast between *criticism* and *criticize*:

- (22) a. How much criticism of himself does John think his wife will tolerate t?  
 b. \*Criticize himself, John thinks his wife will not t.

A fronted predicate nominal behaves on a par with VP and AP, whether it is a *wh*-phrase or not:

- (23) a. A victim of himself<sub>\*i/j</sub>, John<sub>i</sub> thinks Bill<sub>j</sub> will never be.  
 b. A victim of himself, I think Bill will never be.  
 c. \*A victim of myself, I think Bill will never be.  
 (24) a. What sort of a victim of himself<sub>\*i/j</sub> does John<sub>i</sub> think Bill<sub>j</sub> will be?  
 b. What sort of a victim of himself does Mary think John will be?  
 c. \*What sort of a victim of herself does Mary think John will be?

This confirms that the relevant distinction is one between predicates and nonpredicates, and not one between different categorial types.

The examples we have seen up to now illustrate that, with respect to the effects of Principle A, predicate fronting exhibits a narrower range of reconstruction possibilities than argument fronting. Fronted arguments seem to be able to reconstruct both to their base positions and to any intermediate positions they have moved through, whereas fronted predicates can reconstruct only to their base positions. This limitation on fronted predicates also holds with respect to the effects of Principle B:

- (25) a. Criticize him<sub>i/\*j</sub>, John<sub>i</sub> thinks Bill<sub>j</sub> will not.  
 b. \*Criticize her<sub>i</sub>, John thinks Mary<sub>i</sub> will not.  
 c. Criticize her<sub>i</sub>, Mary<sub>i</sub> thinks John will not.  
 (26) a. \*How proud of him<sub>i</sub> do you think John<sub>i</sub> should be t?  
 b. How proud of him<sub>i</sub> does John<sub>i</sub> think I should be?

These sentences show that the pronoun contained in the moved predicate must be disjoint in reference from the embedded subject, but may be coindexed with the matrix subject. This state of affairs is obtained when the predicate is “reconstructed” to the base position. Since one cannot reconstruct the predicate to an intermediate position, there is

<sup>6</sup> Richard Oehrle (personal communication) has observed that, in the case of predicate fronting, if a reflexive is further embedded within an NP, it seems less clear that the predicate can only be reconstructed to its base position. Thus, although *himself* must refer to Bill in (i), it seems less clear that it must also do so in (ii).

- (i) Criticize himself, John thinks Bill will not.  
 (ii) Criticize pictures of himself, John thinks Bill will not.

Why (i) and (ii) should differ in this respect is something that this article will not be able to answer. One possibility, suggested by a reviewer, is that the binding of a reflexive does not involve Principle A if the reflexive is minimally contained in an NP without a subject (as in (ii)). This explanation does not apply to cases where a reciprocal is embedded within an NP, though. The following are equally ill formed:

- (iii) \*How proud of each other do they think that I should be?  
 (iv) \*How proud of pictures of each other do they think that I should be?

no interpretation according to which the pronoun is disjoint from the matrix subject but coreferential with the embedded subject.

Now consider sentences illustrating reconstruction effects with respect to Principle C:

- (27) a. ?\*How many pictures of John<sub>i</sub> does he<sub>i</sub> think that I like?  
 b. ?How many pictures of John<sub>i</sub> do you think that he<sub>i</sub> will like t?

In general, it seems that when an R-expression contained in an NP is moved across a c-commanding pronoun, the strong crossover effects are considerably stronger if the c-commanding pronoun is in the clause immediately containing the moved category than if it is embedded in a lower clause. Hence, (27b) displays a weaker effect of strong crossover than (27a). Now consider cases of strong crossover involving the fronting of a predicate:

- (28) a. ?\*Criticize John<sub>i</sub>, he<sub>i</sub> said I will not.  
 b. \*Criticize John<sub>i</sub>, I said he<sub>i</sub> will not.  
 (29) a. ?\*How proud of John<sub>i</sub> does he<sub>i</sub> think I should be t?  
 b. \*How proud of John<sub>i</sub> do you think he<sub>i</sub> should be t?

(28a) and (29a) appear to be as bad as (27a), as expected. However, whereas in (27b) the strong crossover effects are considerably weakened, in (28b) and (29b) they seem even stronger than in (28a) and (29a). This difference between (27) and (28)–(29) can be seen as another example of the difference between predicates and arguments in their reconstruction possibilities. Let us continue to say that predicates must reconstruct to their base position, whereas arguments can be reconstructed to either their base position or an intermediate position. In (28) and (29), when the predicate is reconstructed to the base position, *John* is c-commanded by *he*, in violation of Principle C, whether *he* is in the matrix or the embedded subject position. In (27) the fronted NP may be reconstructed to the intermediate Spec position. In this position *John* is c-commanded by the matrix subject but not by the embedded subject. Hence, no violation of Principle C need arise.

### 3 The Internal Subject Hypothesis

The question is therefore why predicate phrases cannot reconstruct to any position other than their D-Structure position. One cannot say that predicates do not have intermediate reconstruction sites because their fronting has not taken place successive cyclically through intermediate Spec positions. Such a hypothesis is excluded by considerations of Subjacency and by the fact that a fronted VP or AP may in fact end up in an embedded CP:

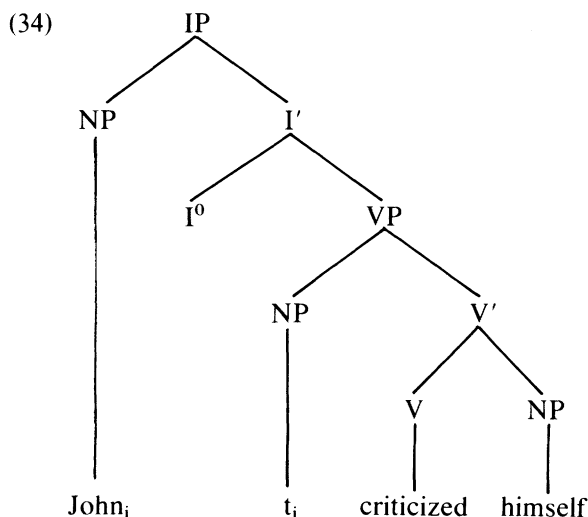
- (30) a. John knows that, criticize himself, Bill never will.  
 b. \*Mary knows that, criticize herself, Bill never will.  
 (31) a. They wonder how proud of each other we can be.  
 b. \*They wonder how proud of each other I can be.

What is more interesting is that the same restriction obtains even with the fronted predicate in such intermediate positions. In each case the anaphor must be bound by the embedded subject. Again this is in direct contrast to cases where an NP is fronted:

- (32) a. John knows that pictures of himself, Bill likes.  
 b. Mary knows that pictures of herself, Bill likes.
- (33) a. They wonder which pictures of each other we should buy.  
 b. They wonder which pictures of each other I should buy.

This shows that the descriptive generalization that we have informally relied on, that fronted VPs and APs cannot reconstruct to intermediate landing sites, must be false. As (30)–(31) show, the restriction should obtain even if predicates are reconstructed to their intermediate landing sites.

I would like to suggest that the facts we have been discussing have a straightforward explanation under the *Internal Subject Hypothesis* (ISH) proposed in recent works. According to one version of this hypothesis (see, e.g., Kuroda 1988), the subject of a sentence is base-generated in the Spec of VP position (more generally that of the predicate XP), but not as the Spec of IP. In (34) the subject has raised to the Spec of IP position, binding its trace in VP at S-Structure.



Now consider one consequence of this hypothesis for binding theory. Following Chomsky (1986b) (see also Huang 1983), the first two binding principles are stated in terms of the notion “complete functional complex” (CFC):<sup>7</sup>

<sup>7</sup> The formulation of binding theory in both Huang 1983 and Chomsky 1986b captures the generalization that the domain in which a pronoun must be free can be smaller than the domain in which an anaphor must be bound. It may be that the definition of the binding domain should not be relativized in this way, and that pronouns and “true” anaphors should be characterized, at least for some languages, as being in strict complementary distribution (see Burzio 1991, Rebuschi 1991). However, the difference between these two views is largely irrelevant for the purposes of this article.

- (35) a. An anaphor  $\alpha$  is bound in the minimal CFC of its governor in which it can be bound.  
 b. A pronominal  $\alpha$  is free in the minimal CFC of its governor in which it can be free.

Given the ISH and the definition of the CFC as a category in which all grammatical functions compatible with its head are realized, the minimal CFC for any pronoun or anaphor contained in a VP is the VP itself, but not IP. In (34) VP is the CFC in which *himself* must be bound. In this case it is bound in accordance with (35a), not by *John* directly, but by the trace of *John* in the Spec of VP.

Now we can see how the facts discussed in section 2 follow from the ISH and binding theory formulated in terms of CFCs. The question is why (36b) cannot be ambiguous like (36a), and why (37b) is ungrammatical, unlike (37a).

- (36) a. Which pictures of himself<sub>i</sub> does John think Bill<sub>i</sub> likes t?  
 b. [<sub>VP</sub> t<sub>i</sub> criticize himself<sub>i</sub>], John said Bill<sub>i</sub> never will t.  
 (37) a. Which pictures of each other did they think I should admire t?  
 b. \*[<sub>AP</sub> How t<sub>i</sub> proud of each other] do they think I<sub>i</sub> should be t?

Given the ISH, the S-Structure representation of each sentence in English contains a trace of the subject in the predicate. When a VP or AP is fronted, the trace of the subject is fronted with it, regardless of where the VP or AP is moved. In (36b) the fronted VP is the CFC in which the reflexive must be bound; therefore, *himself* must be bound by the trace  $t_i$ . Now, independently, the trace must be coindexed with the embedded subject *Bill*, but not with the matrix subject *John*. Otherwise, a  $\theta$ -Criterion violation would result, with *John* receiving two  $\theta$ -roles and *Bill* receiving none. It follows straightforwardly, then, that *himself* in (36b) must be coindexed with *Bill*. And this must be the case regardless of where the VP is moved or reconstructed to. On the other hand, in (36a) the fronted *wh*-phrase is an NP, which does not contain a subject that could serve as the antecedent of the reflexive and therefore does not constitute the domain of binding for the anaphor.<sup>8</sup> Depending on where the fronted NP is reconstructed to, the anaphor contained in it may take either the matrix subject or the embedded subject as its antecedent. The contrasts between (37a) and (37b), between (30)–(31) and (32)–(33), and among the sentences in (23) and (24) follow in the same way.<sup>9</sup> There is no need to rely

<sup>8</sup> Even if they have a pro subject, the pro is not required to be controlled by the embedded subject.

<sup>9</sup> A technical question arises in the cases where an AP or a predicate nominal is fronted, concerning where the internal subject trace should be located in the presence of a degree word like *how* in an AP (as in (37b)) or of a determiner in a predicate nominal (as in (23c) and (24c)). I have assumed that the internal subject is located in the Spec position of an NP. If degree words and determiners are also specifiers of XPs (as assumed in Jackendoff 1977 and other work), then the internal subject of an AP or a predicate NP cannot also occur. However, there is good reason, given research that has led to the “DP hypothesis” (Abney 1987, Fukui 1986, etc.), to assume that the determiner occupies, not the [Spec, NP] position, but a head position taking NP as its complement. There is also good reason to assume that degree words like *how* occupy adjunct positions in AP (adjoined to A' or AP), just as *how* is an adjunct in VP. Under these assumptions, there is no problem in placing the internal subject in [Spec, XP].

on the supposed generalization that predicates, but not arguments, must reconstruct to their base position.

The facts illustrated by (25)–(26) concerning Principle B also follow. The S-Structure representation of (26a) is given in (38).

- (38) [<sub>AP</sub> How  $t_j$  proud of  $him_i/*_j$ ] does  $John_i$  think  $Bill_j$  should be  $t$ ?

In this structure the pronoun *him* cannot be coindexed with the trace  $t_j$ , the Spec of AP. Since the trace is the trace of *Bill*, it follows that *him* also cannot be coindexed with *Bill*, even though the latter occurs outside the CFC containing the pronoun. On the other hand, since no similar restriction applies to the matrix subject *John*, coindexing the pronoun with the latter is possible.

With respect to Principle C, we have just seen that strong crossover effects are weakened if the pronoun occurs in an embedded clause. The sentences in (27) are repeated here:

- (39) a. ?\*How many pictures of  $John_i$  does  $he_i$  think that I like  $t$ ?  
(strong crossover)  
b. ?How many pictures of  $John_i$  do you think that  $he_i$  will like  $t$ ?  
(strong crossover effects weakened)

In cases of predicate fronting, however, no weakening is observed under the same circumstances. Under the ISH, the sentences in (29) have the following structures:

- (40) a. ?\*[<sub>AP</sub> How  $t_j$  proud of  $John_i$ ] does  $he_i$  think  $I_j$  should be  $t$ ?  
(strong crossover)  
b. \*[<sub>AP</sub> How  $t_i$  proud of  $John_i$ ] do you think  $he_i$  should be  $t$ ?  
(strong crossover effects not weakened)

It is not entirely clear how the weakening effect observed in (39b) should be explained, but it seems that this is related to the degree of embedding of the pronoun. This fact recalls the weakening effect observed earlier in connection with the sentences in (12) (see also footnote 4). In the earlier cases an R-expression is ‘‘sufficiently’’ embedded; but in the present case a pronoun is ‘‘sufficiently’’ embedded.<sup>10</sup> There seems to be a broader ‘‘weakening condition,’’ then, which provides that, for some reason, when either member of the coindexed pair {NP1, NP2} in a crossover configuration is embedded to some ‘‘sufficient’’ degree with respect to the other member, crossover is allowed. We can see how the difference between (39) and (40) follows from the ISH. In the structure (39b) the pronoun *he* is sufficiently embedded in relation to *John*, so the coindexed pair {*John*, *he*} is allowed. In (40b) the coindexed pair {*John*, *he*} would be allowed by virtue of the fact that the pronoun *he* is embedded to a degree comparable to that of the pronoun

<sup>10</sup> The depth of embedding of a pronoun also seems to play a role in allowing variable binding:

- (i) ?\*The election of no president<sub>i</sub> will please him<sub>i</sub>.  
(ii) The election of no president<sub>i</sub> will please his<sub>i</sub> opponents.

in (39b). However, given the ISH, this would cause *John* to be coindexed with the trace  $t_i$  as well. Since the pair  $\{t_i, John_i\}$  does not meet the requirement of the “weakening condition,” it strongly violates Principle C; hence, the sentence (40b) is fully ungrammatical.

The ISH thus appears to provide a straightforward explanation for the systematic asymmetry between predicate fronting and argument fronting.<sup>11</sup> There is a technical difficulty in the execution of this explanation, however, as Noam Chomsky (personal communication) has pointed out to me. Recent work on the nature of proper government has indicated the need for a conjunctive formulation of the Empty Category Principle (ECP), according to which a trace needs to satisfy both a condition of licensing by being properly head-governed, and a condition of identification by being antecedent-governed (see Browning 1989, Rizzi 1990; cf. also Aoun et al. 1987, Stowell 1985, Jaeggli 1991, and Roberts 1990). The requirement of antecedent government can be satisfied derivationally (by  $\gamma$ -marking as proposed in Lasnik and Saito 1984) or through reconstruction. In (41) the trace satisfies antecedent government because it was antecedent-governed by *John* at one stage.

(41) How likely  $t_i$  to win is  $John_i$ ?

Proper head government must be satisfied as a condition on representation (at S-Structure, at least), however. This explains the contrast in (42).

(42) a. It was [ $PRO_i$  to be frank] that  $John_i$  tried.  
 b. \*It was [ $t_i$  to be frank] that  $John_i$  seemed.

In (42b) the trace is not properly head-governed at S-Structure even though it was at one stage (cf. *John seemed t to be frank*). If head government is a condition on representation, the ill-formedness of (42b) follows from the ECP.

The problem now arises with respect to the analysis of VP-fronting under the ISH. In (34) the internal subject trace is properly head-governed (by  $I^0$ ) and antecedent-governed (by *John*). In (36b), however, the trace in the fronted VP is not governed in either fashion. Given that head government cannot be satisfied either derivationally or through reconstruction, the problem is how any instance of VP-fronting is ever allowed. The same problem arises with other instances of predicate fronting.

<sup>11</sup> The explanation proposed here is similar to one Barss (1986) considered, but correctly rejected, for cases like (21) and (23)–(24). These cases involve predicational sentences, and Barss showed that the observed asymmetry between argument fronting and predicate fronting can be accounted for if predicational sentences are assumed to contain small clause APs and NPs following *be*, and if the subject before *be* is a derived subject, binding a trace in the subject position of the small clause. For various reasons, however, Barss rejected this account for the asymmetry and argued that the asymmetry instead comes from the unsaturated nature of predicates and from a proposed  $\theta$ -compatibility requirement on chain accessibility. I think Barss is correct in rejecting the small clause account for the asymmetry (also see discussion below), as well as in attributing the asymmetry to the unsaturated nature of predicates. In the account proposed here, the unsaturated nature of predicates is directly captured by the ISH, and the asymmetry is explained without any complicated modification of binding theory. The general idea that the predicate-argument asymmetry may be accounted for by some version of the ISH has also been independently suggested in Kitagawa 1989b, and in informal remarks by Mamoru Saito and David Pesetsky.

A solution suggested by Chomsky is that in so-called VP-fronting, what is fronted is actually a functional category dominating VP rather than the VP itself. More specifically, the fronted category may be the (object) Agreement Phrase proposed in Chomsky 1991 (Agr-O, distinct from the one for subject agreement proposed first by Pollock (1989)). If this is the case, then the internal subject trace will be properly head-governed by Agr-O<sup>0</sup>.<sup>12</sup>

(43) [<sub>AgrP</sub> Agr-O<sup>0</sup> [<sub>VP</sub> t criticize himself]], John said Bill never will.

An apparent difficulty with this idea, however, arises from an important restriction on VP-fronting observed by Akmajian, Steele, and Wasow (1979) (see also the discussion in Roberts 1990), which prohibits the process from moving an auxiliary along with the main verb:

(44) They swore that John might have been taking heroin, and  
 a. . . . taking heroin he might have been!  
 b. \*. . . been taking heroin he might have!  
 c. \*. . . have been taking heroin he might!

This restriction seems to indicate that, in a complex of VP projections, only the smallest VP can be moved; but this apparently conflicts with the idea just entertained that VP-fronting actually fronts an Agr-O phrase.<sup>13</sup>

A solution to this paradox lies in another fact also due to Akmajian, Steele, and Wasow: in passive and adjectival sentences like the following, the copula *be* must be fronted together with the passive or adjectival predicate:

<sup>12</sup> Since the AgrP does not have a subject, there need not be a Spec position in it, assuming that the Extended Projection Principle is a property of IP (TP) only. Or, there may be an empty expletive in the Spec position, but the expletive is deleted at LF, by the principle of Full Interpretation. As an alternative to the Agr-O hypothesis, one might assume that the fronted category is a functional category called Predicate Phrase (similar to that proposed by Bowers (1989)).

<sup>13</sup> In fact, Roberts (1990) takes the restriction illustrated in (44) to mean that VP-fronting fronts only V', stranding the trace of the internal subject. He proposes that auxiliaries like *have* and the progressive *be*, though base-generated as heads, are nevertheless reanalyzed as adjuncts to VP, thus ceasing to be potential head-governors. If auxiliaries are fronted with VP as in (44b) and (44c), then the internal subject trace will also be fronted. In the fronted position, the trace would not be head-governed, the aspectual auxiliaries having been reanalyzed as adjuncts. However, if only V' is fronted, the internal subject trace can be left in situ and head-governed by I<sup>0</sup> (or T<sup>0</sup>).

Obviously, the V'-fronting hypothesis cannot be adopted in this work, or we would no longer be able to explain why VP-fronting exhibits a narrower range of reconstruction possibilities than argument fronting. Furthermore, the hypothesis that an intermediate category may move raises a number of questions concerning other general principles of grammar.

The hypothesis that VP-fronting affects the Agr-O phrase does not account for the fact that the aspectual auxiliaries cannot move along with the main verb. Adapting Roberts's insight that these auxiliaries are somewhat special (in his terms, they are subject to reanalysis), we may tentatively assume that they are degenerate (i.e., do not have maximal (double-bar) projections). A movement that moves these auxiliaries along will then be X'-movement, excluded by the general principle that only XP and X<sup>0</sup> may be moved (Chomsky 1986a). On the other hand, since this principle does not apply to deletion, intermediate categories are freely deleted:

- (i) John could have been studying Spanish, and Mary could (have (been)), too.
- (ii) John saw Mary's friends, and I saw Bill's.

- (45) They all said that John was being obnoxious, and  
 a. \* . . . obnoxious he was being!  
 b. . . . being obnoxious he was!
- (46) They all said that John might have been being followed, and  
 a. \* . . . followed he might have been being!  
 b. . . . being followed he might have been!  
 c. \* . . . been being followed he might have!  
 d. \* . . . have been being followed he might!

The true generalization, then, is that VP-fronting fronts a phrase that is a little larger than a VP, no more and no less.<sup>14</sup> Within the framework that assumes the existence of an Agr-O projection, this larger phrase is the Agr-O phrase, the locus of object or participle agreement. Thus, the paradox disappears, and the idea of Agr-O phrase movement receives independent support. Further support for the idea comes from a fact of Italian, pointed out to me by Luigi Rizzi (personal communication), where overt participle agreement is observable. In (47) the fronted VP contains the marker of object agreement, indicating that what is fronted is the Agr-O phrase.

- (47) Trovata, non l' ho ancora.  
 found-FEM (I)-not her have yet  
 'Found her, I haven't yet.'

I will assume, then, that in so-called VP- or predicate fronting, a maximal category above VP or the predicate is fronted, and the trace of the internal subject is properly head-governed by an  $X^0$  category that is capable of government.<sup>15</sup> However, in the following exposition I will continue to use simplified structures with fronted VPs and traditional terms like VP-fronting.

#### 4 VP-Reconstruction in Chinese

The special restriction on VP-fronting with respect to its reconstruction possibilities apparently holds across many languages. In fact, given the ISH as a hypothesis of Uni-

<sup>14</sup> In some cases the copula cannot front with the main predicate:

- (i) They say he might be followed, and followed he might be.  
 (ii) \*They say he might be followed, and be followed he might.  
 (iii) They say he was followed, and followed he was.

Akmajian, Steele, and Wasow argue that in cases like these, the copula has shifted to a higher Aux position before VP-fronting takes place.

<sup>15</sup> Current work suggests that all  $X^0$  categories of the IP system behave like lexical categories, but that  $C^0$  does not. Chomsky (1989) suggests the distinction between L-projections and non-L-projections, the former including all lexical projections and projections within the IP system. It seems that a simple characterization of the L-categories is that they are the categories that can be defined in terms of the features [ $\alpha N$ ,  $\beta V$ ]. Thus, just as there are four traditional lexical categories (N, V, A, P), so there are four kinds of IPs: tensed IPs are verbal, gerundives are nominal, participles are adjectival, and infinitives are prepositional. Other projections within IP can also be described by these and other features. On the other hand, the category C seems to fall completely outside this feature system.

versal Grammar, the explanation proposed here predicts that the same restriction applies to all languages that exhibit the phenomenon of VP- or predicate fronting. On the face of it, this expectation is not always fulfilled, however. Consider examples of fronting in Chinese. The sentences in (48) have a fronted NP containing a reflexive. As indicated, the reflexive may be coindexed with the matrix subject or with the embedded subject.<sup>16</sup>

- (48) a. *ziji<sub>i/j</sub> de shi, Zhangsan<sub>i</sub> xiwang Lisi<sub>j</sub> neng guan-yi-guan.*  
 self's matter Zhangsan hope Lisi can care-a-little  
 'His<sub>i/j</sub> own business, Zhangsan<sub>i</sub> hopes Lisi<sub>j</sub> will care-for-a-bit.'
- b. *ziji<sub>i/j</sub> de shi, Zhangsan<sub>i</sub> zhidao wo<sub>j</sub> hui chuli.*  
 self's matter Zhangsan know I will handle  
 'His<sub>i</sub>/My<sub>j</sub> own business, Zhangsan<sub>i</sub> knows that I<sub>j</sub> will handle.'
- c. *ziji<sub>i/j</sub> de shi, wo<sub>i</sub> zhidao Zhangsan<sub>j</sub> hui chuli.*  
 self's matter I know Zhangsan will handle  
 'My<sub>i</sub>/His<sub>j</sub> own business, I<sub>i</sub> know Zhangsan<sub>j</sub> will handle.'

Sentence (49) is an example of VP-fronting. Given what we have seen, we expect that the reflexive can be bound by the embedded subject only. But this expectation is not fulfilled, because the sentence is ambiguous in the same way as those in (48).

- (49) *piping ziji<sub>i/j</sub> de pengyou, Zhangsan<sub>i</sub> zhidao Lisi<sub>j</sub> juegui bu hui.*  
 criticize self's friend Zhangsan knows Lisi definitely not will  
 'Criticize his<sub>i/j</sub> own friends, Zhangsan<sub>i</sub> knows Lisi<sub>j</sub> definitely will not.'

This counterexample, however, does not falsify the theory proposed so far. It is fairly well known now that the bare reflexive *ziji* in Chinese can have long-distance antecedents (see Huang and Tang 1991 and the references cited). Descriptively speaking, then, *ziji* can be bound outside its minimal governing category. Under the assumptions of the ISH, this means that an object *ziji* need not be bound by the internal subject. The ambiguity of (49) is therefore not unexpected. More formally, Huang and Tang (1991) propose that the bare reflexive undergoes adjunction (QR) in LF, thus making it possible for it to be locally bound by an antecedent in a higher clause (see Battistella 1989 and Cole, Hermon, and Sung 1990 for somewhat different treatments in a similar spirit). In the present case in (49), *ziji* can be adjoined to the fronted VP, beyond the trace of the internal subject, from where it can be coindexed with *Zhangsan*.

The more interesting fact concerning anaphor binding in Chinese is, however, that long-distance reflexive binding is limited in two important ways, as first observed by Huang (1985), Wang and Stillings (1984), and Battistella and Xu (1986), and further described by Huang and Tang (1991). First, binding by a remote antecedent is possible only when the remote antecedent agrees in  $\phi$ -features (person and number) with all potential antecedents closer to the reflexive (i.e., the local and intermediate subjects).

<sup>16</sup> Some speakers prefer the interpretation according to which the reflexive is coindexed with the matrix subject, but find it somewhat difficult to obtain the embedded subject construal. The relevant point for our purposes is that the matrix subject construal is possible for all speakers.

If this condition is not met, only local binding is allowed. Thus, although (50a) is ambiguous, (50b–c) are not.

- (50) a. Zhangsan shuo Lisi chang piping ziji.  
Zhangsan say Lisi often criticize self  
'Zhangsan<sub>i</sub> said that Lisi<sub>j</sub> often criticized self<sub>i/j</sub>.'
- b. Zhangsan shuo wo chang piping ziji.  
Zhangsan say I often criticize self  
'Zhangsan<sub>i</sub> said I<sub>j</sub> often criticize self<sub>\*i/j</sub>.'
- c. wo shuo Zhangsan chang piping ziji.  
I say Zhangsan often criticize self  
'I<sub>i</sub> say Zhangsan<sub>j</sub> often criticized self<sub>\*i/j</sub>.'

Second, only the bare reflexive *ziji* may have long-distance antecedents. Compound reflexives like *taziji* 'himself/herself', *woziji* 'myself', *niziji* 'yourself', and so on, must have local antecedents:

- (51) Zhangsan shuo Lisi chang piping taziji.  
Zhangsan say Lisi often criticize himself  
'Zhangsan<sub>i</sub> said that Lisi<sub>j</sub> often criticized himself<sub>i/j</sub>.'

If our explanation for the ambiguity of (49) is correct, we expect that sentences with fronted VPs will not be ambiguous when the potential antecedents do not agree in  $\phi$ -features. The expectation is fulfilled this time:

- (52) a. piping ziji de pengyou, Zhangsan zhidao wo juegui bu hui.  
criticize self's friend Zhangsan know I definitely not will  
'Criticize my/\*his own friend, Zhangsan knows I definitely will not.'
- b. piping ziji de pengyou, wo zhidao Zhangsan juegui bu hui.  
criticize self's friend I know Zhangsan definitely not will  
'Criticize \*my/his own friend, I know Zhangsan definitely will not.'

Note that (52a–b) also contrast with sentences like (48b) and (48c). Since these latter cases involve object fronting, not predicate fronting, they are ambiguous even though the two possible antecedents do not agree in  $\phi$ -features. The requirement that potential antecedents must agree does not apply to those cases of long-distance binding where a reflexive acquires a higher antecedent by moving out of its clause *at S-Structure*. In these cases the reflexive may be bound by a higher subject whether or not the lower and the higher subjects agree in  $\phi$ -features. These are cases of local binding analogous to *They wonder which pictures of each other I should buy?* and *Which pictures of each other did he say we should buy?* In Barss's terms, both the matrix and the embedded subject *locally* chain-bind the anaphor, and neither is a closer potential antecedent than the other. Thus, the requirement of feature agreement between local and remote antecedents is irrelevant in these cases.

Similarly, we expect that a compound reflexive contained in a fronted VP must be bound by the lower subject, whereas a compound reflexive contained in a fronted NP may be bound by the higher subject. This expectation is also fulfilled:

- (53) a. taziji<sub>i/j</sub> de shi, Zhangsan<sub>i</sub> xiwang Lisi<sub>j</sub> neng guan-yi-guan.  
 himself's matter Zhangsan hope Lisi can care-a-little  
 'His<sub>i/j</sub> own business, Zhangsan, hopes Lisi<sub>j</sub> will care for a bit.'
- b. piping taziji<sub>\*i/j</sub>, Zhangsan<sub>i</sub> zhidao Lisi<sub>j</sub> juegui bu hui.  
 criticize himself Zhangsan knows Lisi definitely not will  
 'Criticize himself<sub>\*i/j</sub>, Zhangsan<sub>i</sub> knows Lisi<sub>j</sub> definitely will not.'

Relevant facts concerning Principle C also bear out the predictions of the proposed analysis. The following sentences show that strong crossover effects are considerably weakened with a "sufficiently" embedded pronoun (as in (54c)):

- (54) a. ?\*Zhangsan<sub>i</sub> de pengyou, ta<sub>i</sub> changchang piping.  
 Zhangsan's friend he often criticize  
 'Zhangsan's friend, he often criticizes.'
- b. ?\*Zhangsan<sub>i</sub> de pengyou, ta<sub>i</sub> zhidao wo changchang piping.  
 Zhangsan's friend he know I often criticize  
 'Zhangsan's friend, he knows I often criticize.'
- c. ?Zhangsan de pengyou, wo zhidao ta changchang piping.  
 Zhangsan's friend I know he often criticize  
 'Zhangsan's friend, I know he often criticizes.'

In VP-fronting constructions, however, no such weakening effect is observed:<sup>17</sup>

- (55) a. \*piping Zhangsan<sub>i</sub> de pengyou, ta<sub>i</sub> juegui bu hui.  
 'Criticize Zhangsan's friend, he definitely will not.'
- b. \*piping Zhangsan<sub>i</sub> de pengyou, ta<sub>i</sub> zhidao wo juegui bu hui.  
 'Criticize Zhangsan's friend, he knows I definitely will not.'
- c. \*piping Zhangsan<sub>i</sub> de pengyou, wo zhidao ta<sub>i</sub> juegui bu hui.  
 'Criticize Zhangsan's friend, I know he definitely will not.'

The fully ungrammatical status of (55c) is expected because, although the embedded pronoun is "sufficiently embedded" to make the coindexed pair {*Zhangsan*, *ta*} possible, the coindexed pair consisting of *Zhangsan* and the internal subject trace within the fronted VP strongly violates Principle C.

It is clear, then, that the facts of Chinese do not present any problem for the analysis proposed here. In fact, they bear out the predictions of this analysis in details that are otherwise not predicted by, say, a theory based on the supposed generalization that VPs cannot have intermediate reconstruction sites.

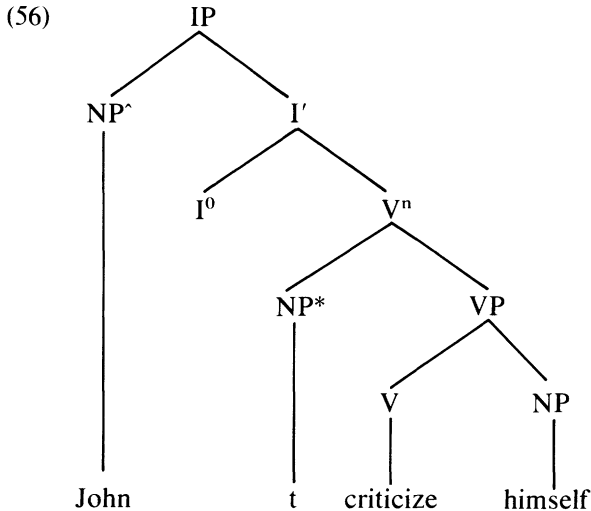
<sup>17</sup> Judgments concerning the absolute status of the sentences in (54) are quite subtle and vary among speakers, but the relevant contrast under consideration, between (54c) and (55c), is clear.

## 5 Some Theoretical Consequences

If the proposed explanation for the predicate-argument asymmetry is on the right track, one obvious consequence is that it provides strong support for the ISH.<sup>18</sup>

### 5.1 *The Position of the Internal Subject*

A more interesting consequence is that it helps to distinguish between different versions of the ISH that have been proposed in the literature. According to Kuroda's proposal, the ISH is represented as in (34). Koopman and Sportiche (1985, 1988; henceforth K&S) assume, however, that the internal subject occurs in construction with the VP to form a small clause. In their formulation, the internal subject originates in the position of NP\* under the small clause V<sup>n</sup> in (56) (see also Sportiche 1988).



Although these versions of the ISH might have been considered notational variants of each other, this supposition is not correct. In particular, the facts of VP-fronting argue for the version proposed by Kuroda (1988) and Kitagawa (1986), against the one proposed by K&S.<sup>19</sup> Recall that the crucial assumption we need to explain the limited reconstruct-

<sup>18</sup> The analysis of VP-fronting in terms of the ISH is reminiscent of the analysis of VP-ellipsis in terms of a  $\lambda$ -predicate proposed by Sag (1976) and Williams (1977) (see Kitagawa 1989a for some discussion). But given Williams's arguments that the interpretation of VP-ellipsis takes place at LF, the facts about such constructions do not provide evidence for the ISH. The ISH is a hypothesis about the D- and S-Structure (and not just LF) representations of sentences. The facts about VP-fronting discussed here do provide that evidence, since traces of the internal subject are crucially needed for the binding principles to apply correctly at S-Structure.

<sup>19</sup> The existence of the small clause construction has been a controversial issue (see Williams 1983 and references cited), and at least some instances of the construction seem better analyzed in terms of control into complex predicates (see Chomsky 1986b, Huang 1992). The discussion concerning (56) assumes that some small clauses do exist. It may be that they do not, in which case the postulation of (56) would be unmotivated, too.

tion effects of fronted VPs is that when a VP is fronted, the trace of the internal subject is fronted with it. This situation is naturally expected given the hypothesis represented by (34), on the assumption that maximal projections and lexical categories may move, but intermediate categories like  $V'$  may not (see Chomsky 1986a). In a structure like (56), however, there is no reason to force the internal subject  $NP^*$  to move under VP-fronting. The VP should be able to move, as a maximal phrase; but if this were possible, then the VP-fronting construction would be expected to allow the reconstruction of the same range of binding possibilities as NP-fronting. To ensure that the trace of the internal subject is fronted when VP-movement takes place, one might stipulate that, in small clause constructions, the entire small clause containing the subject must be moved, and not just the XP contained in it. But this stipulation must be rejected on other grounds. For one thing, there is independent evidence that the XP contained in a true small clause is quite freely movable:

- (57) a. How stupid do you consider John?  
 b. How happy would she make him  $t$ ?  
 c. How angry<sub>2</sub> did he<sub>3</sub> seem  $t_3 t_2$ ?

For another, the following examples show that a small clause in fact cannot be moved as a unit:<sup>20</sup>

- (58) a. \*John stupid, I consider.  
 b. \*Him happy, Mary made.

In fact, even in small clause constructions, there is evidence that the internal subject originates in the XP. That is, the subject of the small clause is itself raised from the XP, binding a trace in the Spec of the latter. The relevant evidence comes from examples like these:

- (59) a. How angry at each other did John think that he has made the men?  
 b. \*How angry at each other did the men think that they have made John?

(59) shows that the reciprocal must be bound by the most deeply embedded subject, the subject of the small clause. To ensure this result, it must be assumed that the fronted AP contains a trace of the small clause subject. It then follows that the position of the internal subject is in the AP or VP (as proposed by Kuroda, Kitagawa, etc.), but cannot be identified as the subject of a small clause outside XP (as proposed by K&S (1988)).<sup>21</sup>

<sup>20</sup> As another possibility, one might suggest that what is fronted in VP-fronting is a category higher than the entire small clause, on a par with the functional category AgrP discussed above. The question that remains, however, is why this possibility does not make the sentences in (58) grammatical.

<sup>21</sup> Fukui and Speas (1986) propose to generate all noncomplements of a lexical category in positions adjoined to  $X'$ . The internal subject, in particular, is adjoined to  $V'$ , like other noncomplements. Since the notion of what counts as a maximal projection is not entirely clear in this system, the facts we have considered do not make a clear choice between their theory and the theory of Kuroda and Kitagawa. What our analysis implies is that, in the system of Fukui and Speas, the first projection  $V'$  that is movable under predicate fronting must include the position of the internal subject, but exclude the subject of a small clause (if the latter is also adjoined to  $V'$ ).

## 5.2 Concerning Parametric Theory

One of the most attractive aspects of the ISH is that it has been shown to be able to contribute to parametric theory in a significant way. For example, Kuroda's (1988) primary argument for the ISH is that it enables one to distinguish languages like English from languages like Japanese with respect to a whole range of parametric differences: the existence of scrambling, *wh*-movement, agreement, double subject sentences, and so on. It is proposed that these differences can be reduced to a single parameter, namely, whether a given language has "forced agreement" or not. Formally, under the ISH, it is proposed that, in English-type languages, the internal subject in the Spec of VP must move to the [Spec, IP] position, the locus of subject-verb agreement, but that in Japanese-type languages, this movement is optional. K&S (1988) argue that the same formal difference exists among languages, the governing factor being a difference in the mechanism of Case marking among them, not in the existence of forced agreement: subject raising is forced if nominative Case is assigned under Spec-head agreement with  $I^0$ , but not if it is assigned under government by  $I^0$ . They propose that this difference underlies other differences among these languages concerning such phenomena as subject extraction and pro drop. In the same spirit, Aoun and Li (1989) argue that such a formal difference explains certain well-known differences between English and Chinese with respect to quantifier scope interpretation.

The explanation proposed here regarding VP-fronting and reconstruction sheds new light upon some of these issues. I will consider two cases: first, the proposal by Aoun and Li (A&L) regarding quantifier scope and, second, the proposal by Koopman and Sportiche (K&S) regarding subject extraction.

*5.2.1 The Syntax of Scope* A central purpose of the work of A&L is to explain, within a theory of quantifier scope, why certain Chinese sentences do not exhibit scope ambiguities of the sort commonly observed in English. It is well known that, in English, both active and passive sentences exhibit scope ambiguities. Thus, the following two sentences admit both a distributive and a collective reading of the universal quantifier:

- (60) Every teacher taught some student. (ambiguous)  
 (61) Every student was taught by some teacher. (ambiguous)

In Chinese, active sentences corresponding to the type represented by (60) are unambiguous. In (62) only the distributive reading is available.

- (62) mei-ge laoshi dou jiao-guo yi-ge xuesheng. (unambiguous)  
 every teacher all teach-EXP one student  
 'Every teacher has taught one student or another.'

More interestingly, they observe that passive sentences of the sort represented by (63) are ambiguous, just like their English counterparts.

- (63) mei-ge xuesheng dou bei yi-ge laoshi jiao-guo. (ambiguous)  
 every student all by one teacher teach-EXP  
 a. 'Every student has been taught by one teacher or another.'  
 b. 'There is a teacher who every student has been taught by.'

The ambiguity of passive sentences like (63) is a problem for the Isomorphic Principle adopted by Huang (1982) (adapting the proposal made in Reinhart 1976; also see Lakoff 1971), which provides that a quantifier A may have scope over a quantifier B if A c-commands B at S-Structure. To account for the relevant facts, A&L first propose to modify the principle so as to take the existence of traces into consideration. In effect, their *Modified* Isomorphic Principle (MIP) provides that a quantifier A has scope over a quantifier B in case A c-commands B *or a trace of B*. The active-passive contrast in Chinese follows from the fact that passive sentences contain a trace of the subject, but active sentences do not. Thus, in the active sentence (62) the subject asymmetrically c-commands the object, and only the distributive reading is available. In the passive (63) the patient subject c-commands the agent phrase, but the agent phrase in turn c-commands the trace of the subject. Both the distributive and the collective readings are available. The active-passive contrast in Chinese thus follows from the MIP. The ambiguity of the passive sentences in English also follows in the same way.

But why are active sentences in English ambiguous? Adopting the ISH, A&L propose that this follows from the interaction of the MIP with the trace of subject raising (from Spec of VP to Spec of IP). In particular, at S-Structure, the English sentence (60) contains a trace of the subject *every teacher* in the Spec of VP. In LF there exists a possibility for the object *some student* to adjoin to VP (May 1985), deriving the following representation:

- (64) [<sub>IP</sub> every teacher<sub>i</sub> [<sub>IP</sub> t<sub>i</sub> -ed [<sub>VP</sub> some student<sub>j</sub> [<sub>VP</sub> t<sub>i</sub> teach t<sub>j</sub>]]]]]

In this structure the subject QP c-commands the object QP, and the object QP in turn c-commands the VP-internal trace of the subject. This gives rise to the ambiguity of the sentence.

The question now comes down to why under the ISH, active sentences in Chinese are unambiguous. A&L postulate that raising of the internal subject to [Spec, IP] does not occur in Chinese. A subject in Chinese is directly generated as [Spec, IP] or [Spec, VP] and stays in its base position at S-Structure. Hence, there is no trace in the internal subject position and no ambiguity.

If the proposed analysis of VP-fronting and reconstruction is correct, A&L's hypothesis that subjects do not raise in Chinese cannot be maintained. In section 4 we saw that VP-fronting may occur in Chinese and that, abstracting away from the cases of long-distance binding, VP-fronting in Chinese exhibits the same limited range of binding possibilities as does VP-fronting in English, in contrast to NP-fronting in both languages. This means that when a VP is fronted in Chinese, a trace of the subject must also be fronted with it. But this requirement is incompatible with A&L's hypothesis.

In light of the analysis proposed here, it thus seems that both the ISH and subject raising hold in Chinese as they do in English.<sup>22</sup> In general, it seems as well that NP-traces do not play a role in determining quantifier scope.<sup>23</sup> The active-passive contrast noted above in Chinese, as well as the contrast between Chinese and English, must be explained in some other way. In fact, some alternative explanation is available for the active-passive contrast. The passive sentence (63) is ambiguous, as noted, with the indefinite agent phrase *bei yige laoshi* 'by one teacher' having broad or narrow scope. It has been widely noted, however, that in Chinese there is a correlation between the definiteness and/or specificity of an NP and its position relative to the verb (see Li and Thompson 1981, among others). In preverbal position, an NP is generally definite or specific. An indefinite NP, in particular, generally tends to receive a specific interpretation. Since agent phrases occur preverbally in Chinese, an indefinite agent phrase will be strongly interpreted as specific. Given this, we can simply say that the ambiguity of (63) arises from interpreting the agent phrase as specific, and therefore as possibly having wide scope. The correctness of this alternative is confirmed by the following two facts. First, as Li and Thompson (1981) note, there is an exception to the general correlation between definiteness/specificity and word order, which arises when the agent NP occurs in bare form. In contrast to a bare NP following *ba* (as in (65a)), a bare NP following *bei* 'by' (as in (65b)) is to be interpreted as nondefinite, nonspecific.

<sup>22</sup> A&L suppose that the subject may originate directly under IP or under VP but stays there at both D- and S-Structure. This amounts to claiming that the ISH holds only optionally of Chinese. They further claim that even subject raising of the standard kind (under raising verbs like *seem* in English) does not exist in Chinese. Alternations of the following kind (with raising predicates like *keneng* 'likely') are not treated as cases of raising:

- (i) *keneng Zhangsan hui lai.*  
likely Zhangsan will come  
'It is likely that Zhangsan will come.'
- (ii) *Zhangsan keneng hui lai.*  
Zhangsan likely will come  
'Zhangsan is likely to come.'

The subject in (ii), in particular, is base-generated directly under the matrix IP and is not related to a position under *keneng*.

A&L's proposal basically destroys the standard motivations and criteria for the identification of raising structures (as opposed to, say, control structures). Considerations of subcategorization, idiom chunk distribution, and the possibilities of expletive subjects, etc., can no longer play a role in deciding whether a given subject is derived or not. But then the choice between raising and no raising must be made in an arbitrary way. In A&L's case, the decision whether Chinese has raising, or whether the ISH holds, depends on the facts regarding the MIP. Thus, although the MIP is claimed to be a principle of Universal Grammar, a serious question of learnability arises—namely, how the child is supposed to know whether the ISH holds and whether there are raising structures in his or her language. I will assume that sentences like (i) and (ii) are related in the standard way by raising.

<sup>23</sup> A variable, on the other hand, may play such a role. Kuroda (1965) and Hoji (1985) observe that scrambling in Japanese affects quantifier scope interpretation. Williams (1988) claims that the sentences in (i) and (ii) treated by May (1985) might be considered to indicate the relevance of a *wh*-trace to quantifier scope interpretation.

- (i) What did everybody buy t?
- (ii) Who t bought everything?

- (65) a. Zhangsan ba ren gan-zou le.  
 Zhangsan BA man chase-away PERF  
 'Zhangsan chased away the man.'  
 b. neiben shu bei ren na-zou le.  
 that book by man take-away PERF  
 'That book was taken away by someone (or other).'

Significantly, in the following sentence containing a quantified subject NP and a non-specific, nondefinite agent phrase, only a distributive reading is available:

- (66) meiyiben shu dou bei ren na-zou le. (unambiguous)  
 every book all by man take-away PERF  
 'Every book was taken away by someone (or other).'

Second, in sentences in which the agent phrase is a universal quantifier (and therefore no specific interpretation is available), again no ambiguity is observed. Thus, (67) admits only a wide scope reading of the subject NP:

- (67) henduo xuesheng bei meiyige laoshi jiao-guo.  
 many student by every teacher teach-EXP  
 'Many students have the experience of having been taught by every teacher.'

The sentence does not have the interpretation of its active counterpart, according to which each teacher has the experience of teaching a large number of students.

There is also independent evidence, from English, that the trace of the internal subject does not play a role in sanctioning quantifier scope ambiguity. In the following examples, although (68a) and (69a) are ambiguous (as (60)–(61) are), the ambiguity disappears under VP-fronting:<sup>24</sup>

- (68) a. No one will teach every student.  
 b. [t teach every student], no one will.  
 (69) a. Someone saw everyone.  
 b. [t see everyone], (I am sure) someone did.

The lack of ambiguity in the (b) sentences can be explained under the simple assumption that, in any sentence, the object NP can have wide scope over the subject if it is adjoined to IP (see May 1985), but must be interpreted as having narrow scope when adjoined to VP. The (a) sentences are ambiguous depending on whether or not the object NP is adjoined to the IP to c-command the subject. In the (b) sentences, the object NP can be adjoined to the VP and receive the narrow scope construal. To obtain the wide scope

<sup>24</sup> This lack of ambiguity parallels that found with VP-ellipsis constructions of the kind treated by Williams (1977). Thus, although (i) is ambiguous, (ii) is not.

(i) Some woman bought every book.  
 (ii) Some woman bought every book, and some man did, too.

construal, the object would have to adjoin to the IP. But IP-adjunction is ruled out, since in these cases it would involve a lowering process and the variable it leaves behind will not be properly bound. (Recall from the discussion of (11) that variable binding cannot be satisfied by reconstruction.) Now, all this is achieved by the crucial assumption that NP-traces do not play a role in determining quantifier scope. Under the approach incorporating the MIP, a wide scope reading for the object QP is incorrectly predicted for the (b) sentences. In the VP-adjoined position, the object QP c-commands the internal subject trace and is predicted to be capable of having broad scope over the subject.

*5.2.2 Subject Extraction* Another important problem of parametric theory to which the ISH has been claimed to provide a solution is that of explaining the possibility of long subject extraction in some languages but not in others, especially in the context of an ECP account of possible and impossible long extraction. Huang (1982) showed that the range of well-known subject-object asymmetries with respect to long extraction, which have been treated under the ECP, should be regarded as instances of a more general asymmetry between complements on the one hand and noncomplements (including subjects and adjuncts) on the other. That is, subjects and adjuncts behave alike with respect to long extraction, in contrast to objects:

- (70) a. ?What<sub>i</sub> do you wonder [whether John would buy t<sub>i</sub>]?  
 b. \*Who<sub>i</sub> do you wonder [whether t<sub>i</sub> would buy the book]?  
 c. \*Why<sub>i</sub> do you wonder [whether John would buy the book t<sub>i</sub>]?

It was proposed that (70b) and (70c) are excluded by the ECP in the same way. One important problem that arises under this approach, however, is that, although adjunct extraction appears to exhibit strict locality effects predicted by the ECP across all languages, subject extraction exhibits considerable freedom in some languages but not in others. For example, in Chinese it is as easy to question the subject of an indirect question as it is to question an object, but it is completely impossible to question an adjunct out of an indirect question. Thus, in the following Chinese examples (which correspond to their English counterparts in (70)), both (71a) and (71b) are well formed, in contrast to (71c).

- (71) a. ni xiang-zhidao [ta mai-bu-mai shenme] ne?  
 you wonder he buy-not-buy what PRT  
 'What is the  $x$  such that you wonder whether he would buy  $x$ ?'  
 b. ni xiang-zhidao [shei mai-bu-mai shu] ne?  
 you wonder who buy-not-buy book PRT  
 'Who is the  $x$  such that you wonder whether  $x$  would buy the book?'  
 c. \*ni xiang-zhidao [ta weishenme mai-bu-mai shu] ne?  
 you wonder he why buy-not-buy book PRT  
 Intended: 'What is the reason  $x$  such that you wonder whether he would, for  $x$ , buy the book?'

In cases such as this, subject extraction appears to behave like object extraction, thus threatening to invalidate the claim that (70b) and (70c) are ruled out by the same principle. To account for the cross-linguistic difference, Huang (1982) stipulated that  $I^0$  properly governs the subject in Chinese, though not in English. The essential spirit of the idea is adopted by K&S (1988), who propose a way to derive this stipulation from a different assumption.<sup>25,26</sup> In terms of the ISH, K&S propose that raising of the internal subject to Spec of IP position (their NP\*-to-NP $\bar{\wedge}$  rule) is obligatory in languages like English but optional in languages like Chinese. Subject extraction under *wh*-movement must therefore take place from the non- $\theta$ -position [Spec, IP] in English (where it is not properly governed by  $I^0$ ), but may take place directly from the  $\theta$ -position [Spec, VP] in Chinese (where it is properly governed by  $I^0$ ). The difference between English and Chinese with respect to subject extraction is then claimed to follow from their proposed Condition on Long Extraction (CLE):<sup>27</sup>

(72) *Condition on Long Extraction (CLE)*

Long extraction is permitted only from a  $\theta$ -dependent position.

A position is  $\theta$ -dependent if it is  $\theta$ -marked or if it is the Spec of a  $\theta$ -marked category. K&S assume, following Chomsky (1986a), that VP is  $\theta$ -marked (by  $I^0$ ), and therefore its Spec is  $\theta$ -dependent. Since subject can be directly extracted from [Spec, VP] in Chinese, a  $\theta$ -dependent position, long extraction of the subject is possible.<sup>28</sup> K&S further

<sup>25</sup> See also Wible 1990 for a similar, but significantly different, approach to long subject extraction in Chinese.

<sup>26</sup> In a way somewhat similar to A&L, Diesing (1989) and Kratzer (1989) have also taken a parametric approach to the ISH. Whereas A&L propose that the ISH may vary cross-linguistically (with the subject possibly originating as [Spec, IP] in Chinese), Diesing and Kratzer propose that verbs within one language may also differ with respect to whether their subject originates as [Spec, IP] or [Spec, VP]. They propose that a difference in these terms is the syntactic root of Carlson's (1977) distinction between individual-level predicates (e.g., *resemble*) and stage-level predicates (e.g., *criticize*). In particular, whereas the subjects of stage-level predicates originate as [Spec, VP] (and raise to [Spec, IP]), the subjects of individual-level predicates originate directly as [Spec, IP]. Among other things, this proposal is claimed to explain important properties in the interpretation of bare plurals originally studied by Carlson. The Diesing-Kratzer hypothesis makes an important prediction regarding the interpretation of VP-fronted sentences. A sentence with a fronted stage-level VP should be unambiguous because a trace of the subject is fronted along with it, but if fronting involves an individual-level VP, which contains no subject trace, the sentence should be ambiguous. This prediction is not borne out, however. As the following sentences indicate, VP-fronting does not display a difference between stage- and individual-level predicates:

- (i) Resemble each other, I think they surely do.
- (ii) Criticize each other, I think they never did.
- (iii) \*Resemble each other, they think John surely does.
- (iv) \*Criticize each other, they think John never did.

The behavior of VP-fronting thus argues against parameterizing the ISH among different verb classes. (A similar conclusion, based on VP coordination, is reached in Burton and Grimshaw 1992, which (together with McNally 1992) also contains additional evidence for the ISH.)

<sup>27</sup> In K&S's terms, languages with obligatory raising in IP are "Class 1" languages, and those with optional raising are "Class 2" languages; languages that disallow long extraction of the subject are "Class A" languages, and those that do allow it are "Class B" languages. By postulating the CLE, they claim that Class 1 is identical to Class A, and that Class 2 is identical to Class B.

<sup>28</sup> The idea that a  $\theta$ -dependent element can undergo long extraction basically recaptures the classical idea that if a trace is lexically governed, then it need not be antecedent-governed.

postulate that the difference with respect to raising stems from a difference in the way nominative Case is assigned between these languages. Raising to Spec of IP is forced in English-type languages, because nominative Case is assigned under Spec-head agreement with  $I^0$  only; a subject cannot receive Case in its D-Structure position. In Chinese-type languages, however, nominative Case may be assigned to the internal subject directly, under government by  $I^0$ , so raising to Spec of IP is not required.

Unlike A&L's theory, the theory proposed by K&S does not exclude raising from happening in Chinese-type languages. Thus, the existence of VP-fronting in this language, which as we have seen entails the existence of raising, is not a problem by itself. The theory does predict that, when VP-fronting takes place, the subject must occur in the external position, under the Spec of IP. In such events, the theory predicts that long extraction of the subject is impossible. This prediction, however, is not correctly borne out. To see this point, let us consider the following sentences:

- (73) a. xiu che, ni xiang-zhidao shei hui-bu-hui ne?  
 repair car you wonder who can-not-can PRT  
 'Who is the  $x$  such that you wonder whether he can repair a car?'
- b. \*xiu che, ni xiang-zhidao ta weishenme hui-bu-hui ne?  
 repair car you wonder he why can-not-can PRT  
 Lit. 'Why <sub>$i$</sub>  do you wonder whether he can repair a car  $t_i$ ?'

The contrast shows that, when the VP is fronted and the subject occurs in the external [Spec, IP] position of an indirect question, it is still possible to long-extract the subject, but completely impossible to long-extract an adjunct. This makes it difficult to maintain the claim that long extraction of the subject is possible only from the VP-internal position.

There is also evidence, independent of VP-fronting, that it is possible to long-extract a subject from the [Spec, IP] position. According to K&S, modals are analyzed as instances of  $I^0$ , which in English is an obligatory raising category. This is quite plausible, especially for modals with epistemic readings, though less so for those with root or deontic readings.<sup>29</sup> Notice that, in Chinese, subjects generally must occur before modals—including those with epistemic readings—at S-Structure:

<sup>29</sup> The epistemic reading of a modal denotes the possibility or futurity of a given state, whereas the deontic reading denotes the obligation, permission, ability, and so on, of the subject of a sentence. Under the epistemic reading, the modal does not select the subject, but under the deontic reading it does. Furthermore, epistemic modals may take idiom chunks and expletive elements as their subjects, but deontic modals may not. These are the standard kinds of considerations that K&S have crucially relied on in deciding between a raising and a nonraising category. By the same considerations, only epistemic modals can plausibly be posited as raising categories. One way to accommodate this epistemic-deontic difference is to assume, following Picallo (1990) (cf. Zubizarreta 1982), that epistemic modals are generated under  $I^0$ , whereas deontic modals are generated as VP-adjuncts, which participate with the main verbs in the selection of their subjects. This is the hypothesis that is consistent with the assumptions of K&S. Another possibility is to assume that epistemic modals are raising categories and deontic modals are control categories, both under  $I^0$ . This hypothesis entails that not all  $I^0$  categories in English are raising categories. A third possibility is to assume that modals are verbs (raising or control verbs). This last view seems most plausible. Tense and Agr alone constitute  $I^0$  (or two I-categories, as in Pollock 1989). Phrases headed by modals are complements to  $I^0$ . In this way,  $I^0$  is always a raising category, but modals may be raising or control categories.

- (74) a. Zhangsan hui chi dao.  
 Zhangsan will late arrive  
 'Zhangsan will arrive late.'  
 b. \*hui Zhangsan chi dao.  
 will Zhangsan late arrive

In sentences like (74a), then, raising must have occurred also in Chinese. The CLE predicts that the external subject of an epistemic modal cannot undergo long extraction. This prediction is not borne out:<sup>30</sup>

- (75) ni xiang-zhidao shei hui-bu-hui chi dao?  
 you wonder who will-not-will late arrive  
 'Who is the *x* such that you are wondering whether *x* will be late?'

A similar point can be made from the position of the subject with respect to sentential adjuncts. It is now generally agreed that reason adverbials like *why* and *weishenme* occur outside VP (see Rizzi 1990 and Tang 1990, among others), or at least they can occur outside the domain of negation and VP:

- (76) ta weishenme meiyou lai?  
 he why did-not come  
 'Why didn't he come?'

Since the subject occurs to the left of *weishenme* in (76), it must have been raised out of VP. Now the CLE predicts that a subject in such an environment cannot be long-extracted in Chinese, but the prediction is again incorrect:

- (77) [ni xiang-zhidao [shei weishenme meiyou lai]]?  
 you wonder who why did-not come  
 'Who is the *x* such that you wonder why *x* did not come?'

Multiple questions in English, a language with obligatory raising to [Spec, IP], also pose a similar problem. For many speakers, the following sentences are each fully acceptable under one interpretation:<sup>31</sup>

- (78) Who wonders whether who fixed the car?  
 (79) Who remembers why who left?

These sentences are acceptable if the embedded subject is paired with the matrix subject *who*, but not if it is paired with the Spec of the embedded CP, *whether* or *why*. An

<sup>30</sup> This problem for the CLE would not arise if, unlike K&S, we analyze modals in both Chinese and English as main verbs (control or raising verbs) that head the VP. Of course, it is conceivable that whereas epistemic modals are verbs in Chinese, they are Is in English. Also it is conceivable that raising to [Spec, IP] applies only in PF in Chinese. I will not entertain these latter possibilities.

<sup>31</sup> See Tiedeman 1990. The same observation has been made independently by Howard Lasnik (personal communication). The well-formedness of (78)—though not that of (79)—is also pointed out by May (1985). The possibility of long-extracting a subject in LF presents an important problem for the Path Containment Condition proposed by Pesetsky (1982) and adopted by May (1985).

appropriate answer to (78) might be something like “Mary wonders whether John fixed the car, and Jane wonders whether Bill fixed the car,” and (79) might be answered with “John remembers why Mary left, and Bill remembers why Jane left.” Neither sentence may be answered, however, with something like “John does.” This means, quite paradoxically, that the embedded subject must undergo long extraction, but not short extraction. Since the subject in English does not occur in a  $\theta$ -dependent position, the well-formedness of these sentences again poses a problem for the CLE.

Note that these problems do not arise under the approach that takes antecedent government as a requirement on traces. For present purposes, let us continue to postulate with K&S that Chinese and English differ in the way nominative Case is assigned, the former under government by  $I^0$ , the latter under Spec-head agreement with  $I^0$ . Raising to [Spec, IP] is forced by Case theory in English but not in Chinese. If raising does occur in Chinese, it is either optional or forced by something other than Case theory. To see how the problems can be solved, first consider (75) again. Under the ISH, the S-Structure representation of (75) is as follows:

- (80) [ni xiang-zhidao [<sub>IP</sub> shei<sub>i</sub> hui-bu-hui [<sub>VP</sub> t<sub>l</sub><sub>i</sub> chi dao]]]?  
 you wonder who will-not-will late arrive

At LF this structure is converted into (81) for the relevant reading, with *shei* ‘who’ in the matrix CP and the operator meaning ‘whether’ in the lower CP.

- (81) [<sub>CP</sub> shei<sub>i</sub> [<sub>IP</sub> ni xiang-zhidao [<sub>CP</sub> hui-bu-hui [<sub>IP</sub> t<sub>2</sub><sub>i</sub> I<sup>0</sup> [<sub>VP</sub> t<sub>l</sub><sub>i</sub> chi dao]]]]]?  
 who you wonder will-not-will late arrive

In this structure the *wh*-phrase *shei* has two traces, *t<sub>l</sub>* in the Spec of VP, and *t<sub>2</sub>* in the Spec of IP. *t<sub>l</sub>* is properly head-governed by  $I^0$ , and *t<sub>2</sub>* is also properly governed by  $I^0$ , which moves to  $C^0$  in LF (Stowell 1985, Rizzi 1990). Assuming a conjunctive formulation of the ECP, both traces must also be antecedent-governed, or  $\gamma$ -marked in the sense of Lasnik and Saito (1984). In (81) *t<sub>l</sub>* is antecedent-governed by *t<sub>2</sub>*, hence [+ $\gamma$ ]. On the other hand, *t<sub>2</sub>* is not governed by its antecedent, because of the intervening operator in the embedded CP; hence, it is [− $\gamma$ ] and violates the ECP. Notice, however, that *t<sub>2</sub>* is an empty expletive, which serves no purpose at the level of LF. Given general considerations of economy of representation and the requirement of Full Interpretation (Chomsky 1986b, 1991), all superfluous symbols must be deleted. In Chomsky’s more recent terms, (81) contains a “nonuniform” three-member chain {*shei*, *t<sub>2</sub>*, *t<sub>l</sub>*}.<sup>32</sup> Since nonuniform chains are, by assumption, not legitimate objects in LF, they must undergo deletion up to the point of allowing a minimum two-member operator-variable chain.

<sup>32</sup> In terms of the notions of A-, A-, and head positions, a chain is uniform if all of its members are in A-,  $\bar{A}$ -, or head positions. Thus, traditional A-chains are uniform chains, and so are chains formed by head movement. Furthermore, since *wh*-movement of adjuncts proceeds from  $\bar{A}$ - to  $\bar{A}$ -positions, the chains it forms are also uniform. *Wh*-movement of an argument forms a nonuniform chain, however, because some of its members are in A-positions, whereas others are in  $\bar{A}$ -positions. In (81) the chain {*shei*, *t<sub>2</sub>*, *t<sub>l</sub>*} is nonuniform. Chomsky’s definition of uniformity in fact does not make use of the traditional A/ $\bar{A}$  distinction, but is based on the notions of “L-relatedness” and “ $\theta$ -relatedness,” the details of which need not concern us here.

Therefore,  $t_2$  must be deleted. Once  $t_2$  is deleted, the representation does not violate the ECP. The well-formedness of (75) follows and so does the general freedom of subject extraction in Chinese. Note that this explanation depends crucially on adopting the ISH. Without the ISH, there would be only one trace in (75), in the position of  $t_2$ , a  $\theta$ -position in this case, serving as the only variable bound by the operator. Deletion is impossible, and the ECP is violated.

The well-formedness of (73a) follows in the same way. At S-Structure the embedded subject occurs in [Spec, IP], binding an NP-trace in the preposed VP (recall from the earlier discussion that NP-traces may be bound under reconstruction, though *wh*-traces may not). Let us assume, following Tang (1990), that topicalization (including VP-fronting) may be IP-adjunction in Chinese (cf. Lasnik and Saito 1992).<sup>33</sup> At LF the subject is moved to the matrix [Spec, CP], and the A-not-A operator is moved to the embedded CP, giving the following structure:

- (82) [<sub>CP</sub> shei<sub>i</sub> [<sub>IP</sub>[<sub>VP</sub> t<sub>1i</sub> xiu che] [<sub>IP</sub> ni xiang-zhidao [<sub>CP</sub> hui-bu-hui  
who fix car you wonder can-not-can  
[<sub>IP</sub> t<sub>2i</sub> t<sub>VP</sub>]]]]]]?

In this structure the trace of the subject in the embedded IP is not antecedent-governed, but it can be deleted. The operator *shei* locally binds the trace of the internal subject in the preposed VP as its variable, and the structure is well formed.

The same explanation is available for the well-formed sentences (78)–(79) in English. The structure of (79), after long extraction of the embedded subject, is as follows:

- (83) [<sub>CP</sub> who<sub>i</sub> who<sub>j</sub> [<sub>IP</sub> t<sub>j</sub> remembers [<sub>CP</sub> why [<sub>IP</sub> t<sub>2i</sub> I<sup>0</sup> [<sub>VP</sub> t<sub>1i</sub> left]]]]]]?

In this structure all traces except  $t_2$  are [+ $\gamma$ ]. Since  $t_2$  is subject to deletion, the structure is again well formed.<sup>34</sup>

The question that arises now is why overt subject extraction exhibits standard ECP effects:

<sup>33</sup> Unlike Lasnik and Saito (1992), Tang argues that topicalization may be IP-adjunction in Chinese but must be movement to [Spec, CP] in English. This explains the contrast between (i) and (ii).

- (i) \*That book, who likes t?  
(ii) neiben shu, shei zui xihuan?  
that book who most like  
'That book, who likes [it] most?'

(i) is ruled out because the Spec of CP is doubly filled by the topic and the *wh*-phrase. (ii) is ruled in, because the topic may be adjoined to IP, leaving the Spec of CP open for *shei* to move into it.

<sup>34</sup> This leaves classical superiority effects (e.g., \**What did who buy?*) unaccounted for under the ECP. This suggests that some version of the Superiority Condition is still needed, as pointed out earlier by Hendrick and Rochemont (1982) on the basis of contrasts like the following:

- (i) Who did you persuade to buy what?  
(ii) \*What did you persuade who to buy?

Noam Chomsky (personal communication) suggests that the Superiority Condition may be reduced to general considerations of economy of derivation: Take the shortest move possible. Given two operators X and Y competing for the same landing site at S-Structure, economy considerations favor movement of the one closer to the landing site. (See Lasnik and Saito 1992 for a somewhat different formulation of superiority.)

(84) \*Who do you remember whether would leave?

That is, in the S-Structure representation in (85), why doesn't deletion of  $t_2$  also save the sentence from being ruled out by the ECP?

(85) [<sub>CP</sub> who<sub>i</sub> do [<sub>IP</sub> you remember [<sub>CP</sub> whether [<sub>IP</sub> t<sub>2i</sub> would [<sub>AP</sub> t<sub>1i</sub> leave]]]]]]?

The answer is that, in this case,  $t_2$  is not deletable. Note that in this structure  $t_1$  as an NP-trace is not Case-marked. If  $t_2$  were deleted, the *wh*-phrase *who* would not be able to inherit Case from it, and the Case Filter would be violated. If  $t_2$  is not deleted, the sentence is ruled out by the ECP at S-Structure. On the other hand, assuming that Case is assigned at S-Structure, deletion of the LF-created  $t_2$  in (83) is allowed, and neither Case theory nor the ECP is violated.<sup>35</sup> The difference between (84) and (78)–(79) is treated as an S-Structure/LF asymmetry with respect to Case theory, unrelated to whether raising to [Spec, IP] has taken place or not.<sup>36</sup>

In the account proposed here, then, the relevant facts regarding subject extraction follow crucially from the ISH, as K&S originally suggested, but they do so in a way that does not involve the CLE.

### 5.3 On the Existence of *V'*-Movement

One final consequence of the proposed analysis of VP-fronting and reconstruction has to do with the question of the existence of *V'*-movement in certain Germanic languages. In any theory of movement, it is generally agreed that Move  $\alpha$  may affect either a maximal category (XP) or a lexical head ( $X^0$ ), the former including standard cases of *wh*-movement and NP-movement, and the latter including subject-auxiliary inversion in English and

<sup>35</sup> The treatment proposed here requires abandoning the Visibility Condition (Chomsky 1981). That is, after deletion of  $t_2$  in LF, an NP-trace can serve as a variable locally bound by an operator. A  $\theta$ -role must be available to the NP-trace even without a Case-marked chain. This assumption is independently required in cases of "quantifier lowering":

(i) Someone seems [t to be here].

As is well known, this sentence has a construal according to which *someone* has narrow scope, meaning 'It seems that there is someone here'. Under May's (1977) proposal, this construal is obtained when *someone* is adjoined to the lower IP:

(ii) [<sub>IP</sub> t<sub>2i</sub> seems [<sub>IP</sub> someone<sub>i</sub> [<sub>IP</sub> t<sub>1i</sub> to be here]]]

$t_2$  can be deleted, avoiding the requirements of proper binding and the ECP, and  $t_1$ , a Caseless NP-trace, serves directly as the variable bound by *someone*.

<sup>36</sup> The explanation proposed here predicts that there is no overt Comp-trace effect in languages in which raising to [Spec, IP] is not obligatory. Recall that in these languages nominative Case may be assigned under government by  $I^0$ . The trace in [Spec, VP] is therefore Case-marked, and an operator may directly inherit Case from it. Thus,  $\bar{A}$ -movement may occur directly from the position of [Spec, VP]. Even if movement should go through the [Spec, IP] position, the trace in this position can be deleted, because deletion is no longer prevented by Case theory. It turns out that real evidence for free overt subject extraction is hard to come by in Chinese and Japanese, because of complicating factors like Subjacency and the possibility of pro drop. Aoun et al. (1987) claim, on the other hand, that some Comp-trace effects are observable in Chinese, though the facts are quite subtle. If their claim is indeed correct, then Chinese and English should belong to the same group, with obligatory raising of  $I^0$  and nominative Case assignment under Spec-head agreement with  $I^0$ . At any rate, free LF extraction of the subject in both languages shows that it does not follow from any supposed nonapplication of raising to Spec of IP.

the process of verb movement in various languages. Movement of an intermediate category is generally not observed. Chomsky (1986a) proposes that the theory of movement should allow only XP- and  $X^0$ -movement. It has been reported for some time, however, that in both German and Dutch, movement of the  $V'$  is apparently also possible. Thus, given a double object sentence like (86), topicalization may affect, not only the entire VP as in (87a), but also a phrase that contains just the verb and one of its objects, stranding the other, as in (87b) and (87c); or the verb may be moved alone, stranding both objects, as in (87d).

- (86) Hans hat [<sub>VP</sub> dem Peter das Buch gegeben].  
 Hans has the<sub>DAT</sub> Peter the book given  
 'Hans has given the book to Peter.'
- (87) a. [Dem Peter das Buch gegeben] hat Hans nicht.  
 b. [Das Buch gegeben] hat Hans dem Peter nicht.  
 c. ??[Dem Peter gegeben] hat Hans das Buch nicht.  
 d. [Gegeben] hat Hans dem Peter das Buch nicht.

One possible implication of this fact is that the theory of movement must be revised to allow for the movement of a category intermediate between XP and  $X^0$  into the Spec of CP. However the theory of movement is revised, it must also address why, it seems, the distribution of  $V'$ -movement is limited to a few languages like German and Dutch (cf. Van Riemsdijk 1987). On the other hand, Thiersch (1985) and Den Besten and Webelhuth (1987) have argued for a different interpretation of sentences like these. According to Den Besten and Webelhuth, there is actually no movement of  $V'$  or  $V^0$  to the Spec of CP in these languages. They argue that in Dutch and German it is possible for one or more internal arguments of the VP to scramble out of the VP, leaving a trace inside the VP. The "remnant" VPs, which contain the traces of scrambling, may in turn be topicalized. Such cases of "remnant topicalization" (as Den Besten and Webelhuth call them) then give rise to the appearance of  $V'$ -movement.

Note that the analysis of VP-fronting and reconstruction that is proposed here makes very different predictions depending on whether a given fronted verbal phrase is a full VP or a  $V'$ , thus enabling us to choose between competing hypotheses about the fronted phrase. Consider the following sentence, with an indirect object anaphor contained in VP and bound by the direct object:

- (88) Sie glaubten, Hans habe den Männern Bilder von einander  
 they believed Hans has the<sub>DAT</sub> men pictures of each other  
 gezeigt.  
 shown  
 'They believed Hans has shown the men pictures of each other.'

In this sentence the anaphor *einander* is uniquely bound by the indirect object *den Männern*, but not to the matrix subject *sie*. Suppose now that the sequence containing the verb and the direct object is topicalized, leaving the indirect object behind:

- (89) [Bilder von einander gezeigt], glaubten sie, habe Hans den Männern.  
 '[Pictures of each other shown], they believed Hans has the men.'

Consider both possibilities. If the fronted phrase is a V', it does not need to contain a trace of the indirect object *den Männern*. Therefore, depending on where the V' is reconstructed to, it should be possible for the anaphor *einander* to be bound by either the matrix subject *sie* or the embedded indirect object *den Männern*. If the fronted phrase is a full VP, then it is a "remnant VP" containing the trace of *den Männern*, as in (90).

- (90) [<sub>*t*<sub>i</sub></sub> Bilder von einander gezeigt], glaubten sie, habe Hans den Männern<sub>*i*</sub>.

If this is the case, then regardless of where the VP is reconstructed to, *einander* must be bound by the trace *t<sub>i</sub>* of *den Männern*, and no ambiguity is allowed.<sup>37</sup>

As it turns out, (89) is not ambiguous, allowing *den Männern* as the only possible antecedent for *einander*. We conclude therefore that so-called V'-movement as illustrated in (89) in fact involves the movement of a full VP.

Similar facts obtain in Dutch, as illustrated by the following contrast:

- (91) Elkaar<sub>*i*/<sub>*j*</sub></sub> geloofden ze<sub>*i*</sub> dat Hans de mannen<sub>*j*</sub> niet voorgesteld had.  
 each other believed they that Hans the men not introduced had  
 'Each other<sub>*i*/<sub>*j*</sub></sub>, they<sub>*i*</sub> believed that Hans had not introduced to the men<sub>*j*</sub>.'
- (92) Elkaar\*<sub>*i*/<sub>*j*</sub></sub> voorgesteld geloofden ze<sub>*i*</sub> dat Hans de mannen<sub>*j*</sub> niet had.  
 each other introduced believed they that Hans the men not had  
 (Lit.) 'Introduced each other, they<sub>*i*</sub> believed that Hans had not to the men<sub>*j*</sub>.'

In (91) a reciprocal NP is moved out of the embedded VP, and it may take either the matrix subject or embedded indirect object as its antecedent. In (92) a VP containing a reciprocal is moved out of the embedded clause, and the reciprocal must be bound by the embedded indirect object, but not by the matrix subject. This contrast follows if the fronted VP in (92) but not the fronted NP in (91) contains a trace of the indirect object *de mannen*.

Consider also the following sentence:

- (93) Ze geloofden dat de mannen aan Hans elkaar niet  
 they believed that the men to Hans each other not  
 voorgesteld hadden.  
 introduced had  
 'They believed that the men had not introduced each other to Hans.'

Topicalizing the NP 'each other' results in the ambiguous sentence (94), but topicalizing the same NP with the verb results in the unambiguous (95).

<sup>37</sup> Under this analysis, the trace *t<sub>i</sub>* of *den Männern* is bound by its antecedent under reconstruction. This creates a problem if the trace of scrambling (*t<sub>i</sub>* in this case) is regarded as a variable on a par with a *wh*-trace, since as we saw earlier, the condition of proper binding cannot be satisfied under reconstruction. However, there is emerging evidence from recent work that scrambling should not be treated as a case of typical  $\bar{A}$ -movement (see Webelhuth 1989, Mahajan 1990, Saito 1991).

- (94) Elkaar<sub>i/j</sub> geloofden ze<sub>i</sub> dat de mannen<sub>j</sub> aan Hans niet voorgesteld hadden.  
'Each other<sub>i/j</sub>, they<sub>i</sub> believed that the men<sub>j</sub> had not introduced to Hans.'
- (95) Elkaar\*<sub>i/j</sub> voorgesteld geloofden ze<sub>i</sub> dat de mannen<sub>j</sub> aan Hans niet hadden.  
'Introduced each other\*<sub>i/j</sub>, they<sub>i</sub> believed that the men<sub>j</sub> had not to Hans.'

The lack of ambiguity in (95) follows if we assume that the trace of the embedded subject is contained in the topicalized VP. But to be a phrase containing the trace of the embedded subject, the topicalized phrase must be, at least, a full VP. The evidence thus supports the remnant movement hypothesis of Thiersch (1985) and Den Besten and Webelhuth (1987).

## 6 Summary

In this article it has been shown that there is a systematic asymmetry between predicate fronting and nonpredicate fronting in the distribution of reconstruction effects with respect to principles of binding theory, and that this asymmetry follows from the Internal Subject Hypothesis and other general principles of grammar. In addition to providing important support for the Internal Subject Hypothesis, this analysis is shown to have important implications for issues concerning the position of the internal subject, the syntax of scope, the distribution of long subject extraction in Chinese and English, and the existence of V'-movement in German and Dutch.

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