

Journal of East Asian Linguistics

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PUBLISHER'S ANNOUNCEMENT

1995 PUBLICATION PROGRAMME

From January 1995, *Journal of East Asian Linguistics* is increasing its publication schedule to 4 issues (1 volume). The number of pages allocated for articles will increase from 300 to 360 per annum.

MAMORU SAITO

ADDITIONAL-WH EFFECTS AND THE
ADJUNCTION SITE THEORY*

The Japanese adjunct *wh*-phrase *naze* 'why' in an ECP configuration can be saved by the addition of another *wh*-phrase in a higher position, as noted by Watanabe (1991), among others. This paper discusses this "additional-*wh*" phenomenon in detail and presents an analysis according to which *naze* in LF adjoins to the higher *wh* instead of moving to a [+*wh*] CP Spec and thereby avoids an ECP violation. It is shown that this analysis provides support for Mahajan's (1989) proposal that clause-internal scrambling, but not long-distance scrambling, can be A-movement and also for Chomsky's (1989) proposal that traces can be licensed with respect to the ECP in the middle of the derivation as they are created. It is argued further that this analysis, together with the bounding facts observed with Japanese scrambling, leads to a strong supporting argument for Chomsky's (1986) hypothesis that the effect of a BC can be circumvented by adjunction.

1. INTRODUCTION

Although Japanese allows multiple *wh* questions rather freely, many speakers find examples such as (1b) and (2b) unacceptable.¹

- (1) a. John-ga nani-o naze katta no
-Nom what-Acc why bought Q
'Why did John buy what'
b. *John-ga naze nani-o katta no
-Nom why what-Acc bought Q
'*What did John buy why'
- (2) a. Dare-ga naze soko-ni itta no
who -Nom why there-to went Q
'*Why did who go there'
b. *Naze dare-ga soko-ni itta no
why who-Nom there-to went Q
'*Who went there why'

The ungrammatical (1b) and (2b) have the configuration '. . . *naze* . . . *wh* . . .', where the adjunct *wh naze* 'why' precedes another *wh*-phrase. An ECP account of these examples is proposed in Saito (1982a, 1987), Yoshida (1989), and Watanabe (1991).

However, the configuration '. . . *naze* . . . *wh* . . .'

 does not always result in ungrammaticality. The addition of a third *wh*-phrase improves (1b) and (2b), as shown in (3).²

- (3) a. Dare-ga naze nani-o katta no (cf. (1b))
 who -Nom why what-Acc bought Q
 '*What did who buy why'
- b. ?Naze dare-ga doko -ni itta no (cf. (2b))
 why who-Nom where-to went Q
 '*Where did who go why'

To the potentially problematic *naze wh* sequence, a "higher *wh*" *dare* 'who' is added in (3a), and a "lower *wh*" *doko* 'where' is added in (3b). Watanabe (1991) discusses the higher-*wh* effect in (3a) in detail and proposes a unified account for this effect and the additional-*wh* effect in English, which is illustrated in (4).³

- (4) a. ?*What books_i do you expect who to give *t_i* to Bill
 b. What books_i do you expect who to give *t_i* to whom

The main purpose of this paper is to propose an alternative analysis for the higher-*wh* effect in Japanese and to examine its consequences. In the following section, I will briefly discuss the ECP account of the contrast in (1)–(2) and Watanabe's (1991) analysis of the higher-*wh* effect. In section 3, I will propose an alternative analysis for (3a) according to which *naze* 'why' adjoins to the higher *wh* in LF and thereby avoids an ECP violation. In section 4, I will show that this analysis provides support for Chomsky's (1986) proposal that the effect of a BC can be circumvented by adjunction. There, I will reconsider Lasnik and Saito's (1992) argument against Chomsky's category/segment distinction and then, assuming this distinction, suggest an analysis of the bounding effects on Japanese scrambling. I will briefly discuss the additional-*wh* effect in English and the lower-*wh* effect in (3b) in the Appendix.

2. WATANABE'S (1991) RELATION PRESERVATION PRINCIPLE

I have previously suggested two different ways to derive the contrast in (1), repeated below as (5), from the ECP.

- (5) a. John-ga nani-o naze katta no
 -Nom what-Acc why bought Q
 'Why did John buy what'
- b. *John-ga naze nani-o katta no
 -Nom why what-Acc bought Q
 '*What did John buy why'

In this section, I will first briefly discuss those suggestions and then summarize Watanabe's analysis of this contrast and the higher-*wh* effect.

In Saito (1982a), I suggested that (5b) violates the ECP because of the "rigidity condition" on quantifier scope. As pointed out by Kuroda (1971), in Japanese, when two quantified NPs occur in their D-structure positions, the asymmetrically c-commanding one necessarily takes wide scope over the other. Thus, (6) allows only the interpretation where the subject NP *dareka* 'someone' takes scope over the object NP *daremo* 'everyone'.

- (6) Dareka -ga daremo -o aisiteiru
 someone-Nom everyone-Acc love
 'There is a person who loves everyone'

But as also observed by Kuroda, when a quantified NP is scrambled over another one, as in (7a–b), a scope ambiguity emerges.

- (7) a. Daremo -o_i dareka -ga *t_i* aisiteiru
 everyone-Acc someone-Nom love
 'Someone loves everyone'
- b. Dareka -o_i daremo -ga *t_i* aisiteiru
 someone-Acc everyone-Nom love
 'Everyone loves someone'

Both (7a) and (7b) are completely ambiguous with respect to the relative scope of the two quantified NPs.⁴

If *wh*-phrases are subject to the condition on quantifier scope illustrated above, as seems reasonable, then in the ungrammatical (5b) *naze* 'why' must take wider scope than *nani* 'what'. Assuming this to be the case, I suggested that LF *wh*-movement raises the latter *wh* to Comp and adjoins the former *wh* to S'. If the original S', being a maximal projection, constitutes a barrier for antecedent government, then the trace of *naze* fails to be antecedent governed and consequently, violates the ECP. On the other hand, in (5a),

the object *wh nani* is apparently scrambled over the adjunct *wh naze*. Hence, either *wh* may take scope over the other. In particular, *nani* can take wider scope than *naze*. Thus, the latter *wh* can move into Comp and antecedent govern its trace. Since the trace of *nani* is lexically governed, the example has an LF representation where no trace is in violation of the ECP.

In Saito (1987), I suggested that the linear crossing constraint on the interpretation of *wh*-phrases may (possibly redundantly) force (5b) to violate the ECP at LF. Let us consider (8), where the object *wh* is scrambled over the subject *wh* in the embedded clause.⁵

- (8) Kimi-wa [_{CP} [_{IP} dono hon -o_i [_{IP} dare-ga
you -Top which book-Acc who-Nom
tosyokan-kara t_i karidasita]] ka] siritai no
library -from checked-out Q want-to-know Q
'Q you want to know [Q [which book_i, who checked out t_i from
the library]]'

The following are the four logically possible scope interpretations of the *wh*-phrases.

- (9) a. Both *whs* take embedded scope, and the matrix clause is a yes/no question.
b. Both *whs* take matrix scope, and the embedded clause is a yes/no question.
c. *Dono hon* takes matrix scope, and *dare* takes embedded scope.
d. *Dare* takes matrix scope, and *dono hon* takes embedded scope.

The reading in (9a) is allowed, and those in (9b) and (9c) are marginally possible.⁶ But the interpretation in (9d) is simply impossible. Given this and other facts, I suggested that the association of *wh*-phrases and Q-morphemes is subject to a linear crossing constraint of the kind proposed in Baker (1977). The constraint can be stated as in (10).

- (10) Suppose a sentence contains $\langle wh_1, \dots, wh_n, Q_1, \dots, Q_m \rangle$, where wh_i precedes wh_{i+1} and Q_j precedes Q_{j+1} . Then, the *wh*-phrases and the Q-morphemes must be associated at S-structure as follows:
(a) Every *wh* is linked to a Q-morpheme. If wh_i is linked to Q_j , then no wh_h , $h > i$, is linked to Q_k , $k > j$.
(b) If the maximal sequence of *wh*-phrases linked to Q_j is $\langle wh_i, \dots, wh_{i+k} \rangle$, then wh_{i+k} , the last member of the *wh* sequence, is coindexed with Q_j .

The basic idea here is that of a "push-down storage mechanism." As a sentence is processed from left to right, the *wh*-phrases are stored in the order they appear. Then, as one encounters Q-morphemes, the stored *wh*-phrases are "discharged," starting from the end (bottom) of the list. This prohibits crossing in the *wh*-Q relations ((10a)). And when two or more *wh*-phrases are associated with a single Q-morpheme, the last one has a special status: it is the first *wh* to be linked to the Q-morpheme, and hence, it is the one that actually "licenses" the [+wh] feature of the Q-morpheme ((10b)).

The clause (10a) prevents (8) from having the reading in (9d). If *dono hon* 'which book' is linked to the embedded Q, then *dare* 'who', which linearly follows this *wh*, cannot be linked to the matrix Q since the matrix Q follows the embedded Q in linear order. Thus, the interpretation in (9d) is excluded. The clause (10b), on the other hand, guarantees that *nani* 'what' is coindexed with the Q-morpheme in (5b). Since there is only one Q-morpheme in this example, the two *whs* must both be linked to this Q. (10b) states that the last *wh* in linear order must be coindexed with it. If a *wh*-phrase coindexed with a Q-morpheme must move in LF to the Spec of the CP headed by the Q-morpheme, because of Spec/head agreement, then in (5b) *nani* moves to the CP Spec position, and the adjunct *wh naze* adjoins to the CP or to the CP Spec. In the resulting LF representation, the trace of *naze* fails to be antecedent governed, and thus the example is excluded by the ECP. In (5a), on the other hand, *naze* is coindexed with the Q-morpheme at S-structure. Hence, this *wh*-phrase moves to the CP Spec position in LF, and antecedent government obtains. Thus, there is no ECP violation in the LF representation of this example.

Watanabe (1991) presents a more comprehensive analysis for the examples in (5) and other related data.⁷ He first shows convincingly that the account of (5b) in terms of linear crossing is untenable. His crucial example is shown in (11).

- (11) [_{CP} John-ga naze kubi-ni natta to]_i dare-ga t_i itta no
-Nom why was-fired Comp who-Nom said Q
'Q [[that John was fired why]_i, who said t_i']

(10) predicts falsely that this example should have the same status as (5b). According to (10b), the *wh dare* 'who', which linearly follows *naze* 'why', must be coindexed with the Q-morpheme at S-structure. Hence, the LF movement of *naze* should result in an ECP violation, exactly as in (5b). Yet (11) clearly does not have the status of an ECP violation. Thus, (11) shows that the clause (b) of (10) must be abandoned. And without the clause (b), (10) does not force (5b) to be an ECP violation.⁸

On the basis of examples such as (3a), repeated below as (12), Watanabe suggests that examples like (5b) should be given a unified account with superiority violations in English.

- (12) Dare-ga naze nani-o katta no
 who -Nom why what-Acc bought Q
 ‘*What did who buy why’

An example of superiority contrast is shown in (13).

- (13)a. What_i did you give *t_i* to who
 b. ?*Who_j did you give what to *t_j*

The relevant generalization here is that if two *wh*-phrases take scope at the same CP and one asymmetrically *c*-commands the other at D-structure, then the *c*-commanding *wh* must be the one in the CP Spec at S-structure.⁹ As noted above, superiority violations can be “remedied” by the addition of a third *wh*. The relevant examples in (4) are repeated below in (14).

- (14)a. ?*What books_i do you expect who to give *t_i* to Bill
 b. What books_i do you expect who to give *t_i* to whom

Since (12) indicates that the violation in (5b) can also be “remedied” by a third *wh*, Watanabe concludes that (5b) and superiority violations demand a unified account.

The first step Watanabe takes toward a unified account is to analyze superiority violation as a kind of rigidity violation. If we assume that *whs* in situ are adjoined to CP Spec at LF, then the LF representations of (13a) and (13b) are as in (15a) and (15b) respectively.

- (15)a. [_{CP} [_{NP} [_{NP} who]_i] [_{NP} what]_j] [_{IP} you [_{VP} gave *t_j* [_{PP} to *t_i*]]]]
 b. [_{CP} [_{NP} [_{NP} what]_j] [_{NP} who]_i] [_{IP} you [_{VP} gave *t_j* [_{PP} to *t_i*]]]]

In these LF representations, the trace *t_j* asymmetrically *c*-commands the trace *t_i*. Now suppose that this *c*-command relation must be preserved by the *wh*-phrases binding these traces. Watanabe (1991) states this condition as in (16).¹⁰

- (16) *Relation Preservation*: A relation established at a certain point of derivation must be maintained throughout.

According to this principle, *what* must asymmetrically *c*-command *who*

in the CP Spec in (15a–b). It then excludes (15b), but not (15a), if the following definition of *c*-command is employed:

- (17) *X seg-commands Y* =_{df} X does not dominate Y, and every segment that dominates X dominates Y, where X, Y are categories.

In this definition, Chomsky’s (1986) category/segment distinction is assumed. Thus, in an adjunction structure [_{XP} YP XP], the two XP nodes are distinct segments of the same category. Further, a segment dominates a category if and only if it dominates all segments of the category. In (15a), the NP *what* *seg*-commands the NP *who* since the first segment dominating the former is the CP, and the CP dominates the latter. Thus, the relation between the traces is preserved by the *wh*-phrases. In (15b), on the other hand, the NP *what* fails to *seg*-command the NP *who*. The first segment dominating the NP *what* is the higher segment of the NP *who*. This segment does not dominate the NP *who*, given the assumption that no segment dominates itself. Thus, the condition in (16) accounts for the contrast in (13).

Watanabe argues that (16) automatically explains the contrast in (5), repeated below as (18).

- (18)a. John-ga nani-o naze katta no
 -Nom what-Acc why bought Q
 ‘Why did John buy what’
 b. *John-ga naze nani-o katta no
 -Nom why what-Acc bought Q
 ‘*What did John buy why’

He argues on independent grounds that Japanese has syntactic *wh*-movement exactly as in English.¹¹ Given that Japanese allows all *whs* to be in situ, what moves in Japanese must be an empty operator. Assuming the DP hypothesis, Watanabe hypothesizes that the empty operator moves from the Spec position of a *wh* DP. One consequence of this hypothesis is that the apparent *wh*-island effect observed with (8), repeated below as (19), can be attributed to Subjacency.

- (19) Kimi-wa [_{CP} [_{IP} dono hon -o_i] [_{IP} dare-ga
 you -Top which book-Acc who -Nom
 tosyokan-kara *t_i* karidasita]] ka] siritai no
 library -from checked-out Q want-to-know Q
 ‘Q you want to know [Q who checked out which book from the library]’

As noted above, this sentence only marginally allows the readings corresponding to the following English examples:¹²

(20)a. ?*Which book_i do you want to know whether who read t_i

b. ??Which book_i do you want to know who_j t_j read t_i

This fact straightforwardly follows from Watanabe's hypothesis. If Japanese has syntactic *wh*-movement (empty operator movement), then (19), with those readings, must involve syntactic movement out of a *wh*-island and, hence, must violate Subadjacency.

Watanabe maintains that all *whs* in situ, including the one from which an empty operator moved to CP Spec, must adjoin to the empty operator in LF. In addition, he assumes that the one associated with the operator must adjoin to it first and form a constituent with it. Given these assumptions, there are only two possible LF representations for the ill-formed (18b).¹³

(21)a. [_{CP} [_{NP} [_{NP} nani-o]_j [_{NP} [_{ADVP} naze]_i [_{NP} Op]_i]_i] [_{IP} John-ga t_i t_j katta] no]

b. [_{CP} [_{NP} [_{ADVP} naze]_i [_{NP} [_{NP} nani-o]_j [_{NP} Op]_j]_j] [_{IP} John-ga t_i t_j katta] no]

The latter LF represents the case in which the syntactic empty operator movement takes place from *nani* 'what'. Since the adjunct trace is not antecedent governed, this LF violates the ECP exactly as the LF of the English example (22).

(22) *What_j did you buy t_j why

(21a) is the LF obtained when the empty operator moves from *naze* 'why'. This LF, like that of (23), does not violate the ECP, provided that the operator and *naze* are coindexed via Spec/head agreement.

(23) Why_i did you buy what t_i

However, this LF is in violation of the relation preservation principle in (16). In the CP Spec *nani* asymmetrically seg-commands *naze*, but the trace of *naze* asymmetrically seg-commands that of *nani*. Thus, the LFs in (21) are both excluded, and the ungrammaticality of (18b) is accounted for. (18a), in contrast, has the following well-formed LF representation:

(24) [_{CP} [_{NP} [_{NP} nani-o]_j [_{NP} [_{ADVP} naze]_i [_{NP} Op]_i]_i] [_{IP} John-ga t_j t_i katta] no]

This LF violates neither the ECP nor the principle in (16).

The fact that an additional higher *wh* saves (18b) leads Watanabe to a

particular interpretation of the principle in (16). The relevant example, (12), is repeated below as (25).

(25) Dare-ga naze nani-o katta no
 who -Nom why what-Acc bought Q
 '*What did who buy why'

Given Watanabe's hypothesis, the empty operator must originate from *naze* if the LF of this example is to satisfy the ECP. Otherwise, the trace of this *wh* fails to be antecedent governed at LF. The well-formed LF representation of (25), then, must be as in (26). (The order of adjunction between *dare* and *nani* is irrelevant here.)

(26) [_{CP} [_{NP} [_{NP} dare-ga]_k [_{NP} [_{NP} nani-o]_j [_{NP} [_{ADVP} naze]_i [_{NP} Op]_i]_i]_i] [_{IP} t_k t_i t_j katta] no]

Here, the relation of *nani* 'what' and *naze* 'why' is in violation of (16). *Nani* asymmetrically seg-commands *naze*, but its trace is asymmetrically seg-commanded by that of *naze*. However, *naze* is in licit relation with *dare* 'who'. *Dare* and its trace asymmetrically seg-command *naze* and its trace, respectively. Watanabe hypothesizes that (26), in contrast with (21a), is well-formed because of this licit relation. That is, he hypothesizes that a multiple *wh*-question is allowed as long as the *wh* coindexed with the empty operator (and hence with the head C) is in licit relation with one other *wh*. He states this hypothesis as in (27).

(27) There is only one *wh*-relation per [+wh] Comp.

Watanabe accounts for the additional-*wh* effect on English superiority examples in the same way, and thus achieves a unified analysis for the contrast in (18) and the superiority effect in English.

In this paper, I will basically assume Watanabe's analysis for the contrast in (18). If we adopt his analysis only for Japanese examples like (18), the analysis can be interpreted as a much improved version of the rigidity account. The rigidity analysis of (18b) in Saito (1982a) crucially assumes that if *naze* 'why' moves to Comp (= CP Spec) then *nani* 'what' must adjoin to S' (= CP). Although CP adjunction by *nani* may be possible, there does not seem to be any strong reason to exclude adjunction to CP Spec. Watanabe's syntactic *wh*-movement hypothesis enables us to extend the rigidity account to this case.¹⁴ In the following section, however, I will propose an alternative account for the higher-*wh* effect observed in (25). There, I will present some facts that are unexpected under Watanabe's analysis and show how they motivate the alternative. I will come back to the additional-*wh* effect on the superiority examples briefly in the Appendix.

3. THE HIGHER-*WH* EFFECT IN JAPANESE

In this section, I will first show that a higher *wh* saves *naze* 'why' contained within an island and propose that this saving effect obtains because *naze*, in LF, has the option of adjoining to the higher *wh*, instead of moving out of the island to the Spec of a [+*wh*] Comp. Then, I will show that this analysis crucially relies on Chomsky's (1989) conception of the ECP and Mahajan's (1989) proposal on scrambling and hence, if correct, provides support for them. In section 3.2, I will discuss the locality requirements imposed on the higher *wh* and argue that they provide strong evidence for the analysis of the higher-*wh* effect proposed here.

3.1. *The Higher-Wh Effect within Islands*

An additional higher *wh* saves *naze* 'why' not only in the configuration in (18b) but also in more typical ECP configurations. Let us consider the typical example of an ECP violation in (28).

- (28) *John-wa [_{NP} [_{IP} sono hon -o naze katta] hito] -o
 -Top that book-Acc why bought person-Acc
 sagasiteru no
 looking-for Q
 'Q John is looking for [the person [that bought that book why]]'

The adjunct *wh naze* is contained within a complex NP in this example.¹⁵ Hence, as discussed in detail in Huang (1982), the LF movement of this *wh* to the matrix CP Spec inevitably produces a trace in violation of the ECP. However, when we replace *sono hon* 'that book' in the relative clause by *nani* 'what', the example improves considerably as shown in (29).

- (29) ??John-wa [_{NP} [_{IP} nani-o naze katta] hito] -o
 -Top what-Acc why bought person-Acc
 sagasiteru no
 looking-for Q
 'Q John is looking for [the person [that bought what why]]'

Note that the "additional *wh*" must be in a position preceding (c-commanding) *naze* 'why'. If it follows *naze*, then there is no improvement, as shown in (30).

- (30) *John-wa [_{NP} [_{IP} naze nani-o katta] hito] -o
 -Top why what-Acc bought person-Acc
 sagasiteru no
 looking-for Q

Thus, (29) seems to be a clear instance of the higher-*wh* effect.¹⁶

A similar paradigm can be constructed with *naze* 'why' contained within an adjunct, as shown in (31).

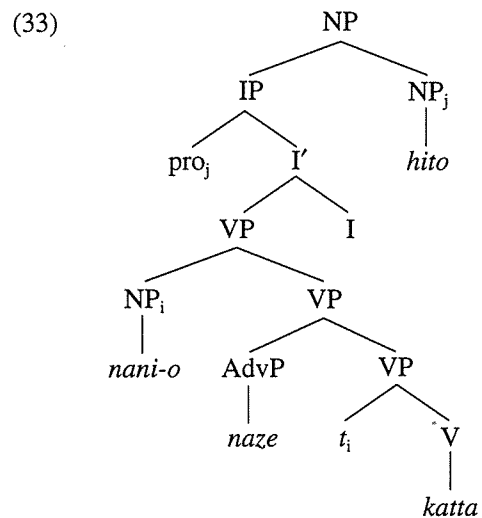
- (31)a. *John-wa [_{PP} [_{IP} Mary-ga sono hon -o naze katta]
 -Top -Nom that book-Acc why bought
 kara] okotteru no
 since angry Q
 'Q John is angry [because Mary bought that book why]'
- b. ?John-wa [_{PP} [_{IP} Mary-ga nani-o naze katta] kara]
 -Top -Nom what-Acc why bought since
 okotteru no
 angry Q
 'Q John is angry [because Mary bought what why]'
- c. *John-wa [_{PP} [_{IP} Mary-ga naze nani -o katta] kara]
 -Top -Nom why what-Acc bought since
 okotteru no
 angry Q

(31a) is ruled out since the LF movement of *naze* results in an ECP violation. But the addition of a higher *wh* improves the example, as shown in (31b). The contrast between (31b) and (31c) indicates that the added *wh* must be in a position higher than *naze*. The effect of an added higher *wh* is, for some unknown reason, generally less clear in the case of *naze* contained in a *wh*-island. But the following examples illustrate the same kind of contrast as (31):

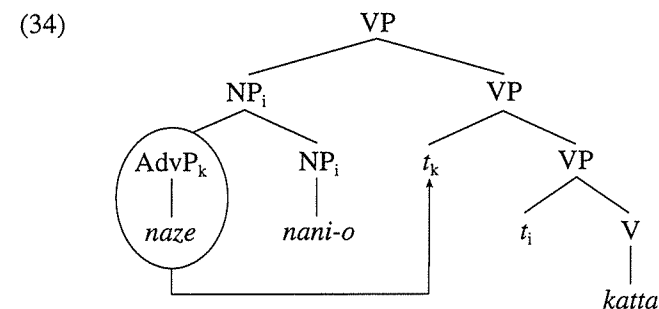
- (32)a. *Kimi-wa [_{CP} Mary-ga naze sono hon -o katta
 you -Top -Nom why that book-Acc bought
 kadooka] siritai no
 whether want-to-know Q
 'Q you want to know [whether Mary bought that book why]'

- b. ??Kimi-wa [_{CP} dare-ga naze sono hon -o katta
 you -Top who-Nom why that book-Acc bought
 kadooka] siritai no
 whether want-to-know Q
 'Q you want to know [whether who bought that book why]'
- c. *Kimi-wa [_{CP} naze dare-ga sono hon -o katta
 you -Top why who-Nom that book-Acc bought
 kadooka] siritai no
 whether want-to-know Q

It was shown above that the addition of a higher *wh* saves *naze* 'why' contained within an island. In the relevant examples, if *naze* simply moves out of the island in LF, it should produce a trace in violation of the ECP. Hence, it is reasonable to hypothesize that the added higher *wh* provides a means for *naze* to avoid this movement. Let us consider the structure of the complex NP in (29), shown in (33), to see how this may be possible.



Here, the object *wh nani* 'what' must move to the matrix CP Spec in LF, and further, since it is an argument, it can move out of the island without producing a trace in violation of the ECP. Suppose, then, that *naze* can adjoin to the object *wh*, as in (34), and license ([+gamma]-mark, in the sense of Lasnik and Saito (1984)) its trace by virtue of antecedent government from the adjoined position.



The "complex *wh*-phrase," containing both *nani* and *naze*, should be able to move out of the island without causing an ECP violation since this movement produces only traces of an argument *wh*-phrase. Thus, both *nani* and *naze* reach the matrix CP Spec without producing a trace in violation of the ECP, and the contrast between (28) and (29) is accounted for.

Given the analysis sketched above, it is not surprising that only an additional *wh* in a higher position can save *naze*. Even if *naze* lowers and adjoins to *nani* in (30), it should fail to license its trace from the adjoined position. Further, it follows that only *wh*-phrases show this saving effect. The idea here is that *naze* can get a "free ride" to a CP Spec by adjoining to another *wh*-phrase moving to that CP Spec. Hence, even if *naze* adjoins to the non-*wh* object *sono hon* 'that book' in (28), it clearly cannot be saved. Since the object NP does not undergo LF *wh*-movement, *naze* fails to reach the CP Spec where it is interpreted.

When this analysis of the higher-*wh* effect is made more precise, it crucially relies on two recent proposals; one is found in the formulation of the ECP presented in Chomsky (1989) and Chomsky and Lasnik (1991), and the other, which concerns the nature of scrambling, is due to Mahajan (1989). In the remainder of this subsection, I will first explain how the analysis fails if we assume the formulation of the ECP in Lasnik and Saito (1984) and the analysis of scrambling in Saito (1985), and then show how those more recent proposals enable us to maintain the analysis. The purpose of this discussion is two-fold: to present the analysis of the higher-*wh* effect in a more precise fashion and to discuss its implications for the formulation of the ECP and the analysis of scrambling.

In Lasnik and Saito (1984), where [+/-gamma]-marking was first introduced, it is assumed crucially that traces can be licensed ([+gamma]-marked) only at S-structure and LF, and not at an intermediate stage of the derivation from S-structure to LF. This assumption enables us to rule out examples such as (35).

(35) *Who_i t_i [_{VP} [_{VP} fixed the car] how]

As discussed in detail in Huang (1982), there are good reasons to attribute the ungrammaticality of this example to the ECP. Now suppose that *how* can first adjoin to VP and then adjoin to *who* in LF, as proposed in Chomsky (1986). This derivation is illustrated in (36).

(36) [_{CP} [_{NP} [_{ADVP} how]_j] [_{NP} who]_i] [_{IP} t_i [_{VP} t'_j [_{VP} [_{VP} fixed the car] t_j]]]]

Here, if a trace can be licensed at an intermediate stage of the derivation, *how* should be able to license its initial trace from the position of the intermediate trace t'_j. Then, after *how* moves to CP Spec, the intermediate trace can delete. Thus, (35) would have an LF representation with no unlicensed trace, i.e., with no trace in violation of the ECP. On the other hand, if a trace can be licensed only at levels, we can avoid this undesirable consequence. If the intermediate trace t'_j in (36) deletes in LF, then the initial trace t_j fails to be licensed at LF. If the intermediate trace does not delete in LF, then it successfully licenses the initial trace at LF, but it itself fails to be licensed at this level. Thus, the LF representation of (35) will necessarily contain a trace in violation of the ECP. But if a trace can be licensed only at levels, the analysis illustrated in (34) clearly cannot be maintained. At LF the NP containing *naze* 'why' and *nani* 'what' is in the matrix CP Spec. Hence, *naze* and its trace are separated by a barrier at that point, and the trace should fail to be licensed.

The analysis in (34) faces another difficulty if we assume the proposal in Saito (1985) that scrambling is uniformly A'-movement. Given this assumption, the scrambled object *wh* is in an A'-position, and hence, *naze* is adjoined to an A'-position in (34). But antecedent government from an A'-adjoined position (i.e., a position adjoined to an A'-position) is clearly impossible. Otherwise, the LF representation in (36) would have no trace in violation of the ECP. The initial trace of *how*, t_j, is licensed by the intermediate trace t'_j. And if antecedent government from an A'-adjoined position were possible, the intermediate trace t'_j would be licensed by *how*. Thus, the analysis in (34) is difficult to maintain if scrambling is uniformly A'-movement.

But as noted above, there are more recent proposals on the ECP and scrambling that enable us to maintain the adjunction analysis in (34). First, it is proposed in Chomsky (1989) that a trace can in fact be licensed in the middle of a derivation.¹⁷ Chomsky (1986) suggests, mainly on conceptual grounds, that the disjunction in the definition of proper government should be eliminated and that all traces must be subjected to the antecedent

government requirement. This proposal receives empirical support from examples such as (37), which is attributed to Mark Baker.

(37) *John_i seems that it was told t_i that Mary is a genius

The trace t_i in this example is lexically governed by the verb *told*. Hence, if lexical government suffices to license a trace, the ungrammaticality of this example cannot be explained by the ECP. On the other hand, if all traces must be antecedent governed, the example is correctly ruled out: the NP *John* is clearly "too far" to antecedent govern the trace t_i.

The antecedent government requirement faces an obvious problem with examples such as (38).

(38) Who_i t_i bought what

If *what* directly adjoins to *who* in CP Spec, then its trace fails to be antecedent governed since, as noted above, antecedent government from an A'-adjoined position clearly must be prohibited. If this *wh* moves through the VP-adjoined position, as in (39), then the intermediate trace can antecedent govern the initial trace, but the intermediate trace fails to be antecedent governed.

(39) [_{CP} [_{NP} [_{NP} what]_j] [_{NP} who]_i] [_{IP} t_i [_{VP} t'_j [_{VP} bought t_j]]]]

Thus, (38) is incorrectly ruled out under either option. In order to solve this problem, Chomsky (1989) suggests that a trace can be licensed by virtue of antecedent government at an intermediate stage of a derivation. According to this hypothesis, *what* licenses the initial trace from the VP-adjoined position. After the *wh* adjoins to the CP Spec, the intermediate trace in the VP-adjoined position can delete. Thus, (38) has an LF representation in which all traces satisfy the antecedent government requirement, i.e., an LF representation in which all traces are (or have been) licensed by virtue of antecedent government.

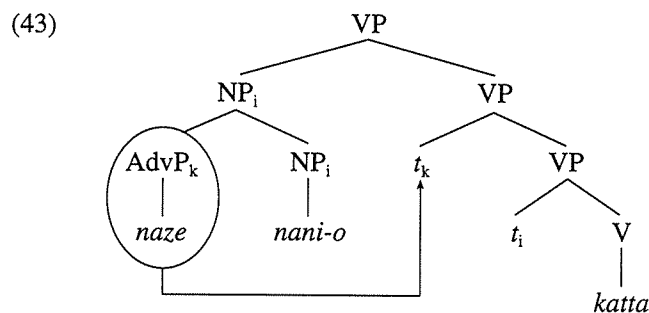
Note that this LF derivation for (38) is exactly parallel to the one we had to prevent for (35). As we saw above, if *how* can license its trace from the VP-adjoined position and if the intermediate trace can delete in LF, then the ungrammaticality of this example cannot be attributed to the ECP. This problem, however, can be solved if the deletion of the intermediate trace in (36), as opposed to that of t'_j in (39), can somehow be prevented. If the intermediate trace in (36) cannot delete, then it violates the ECP at LF since it clearly fails to be antecedent governed (licensed). Chomsky (1989) first suggests as part of the Principle of Full Interpretation (FI) that the chains in (40a-c), but not that in (41), are allowed at LF:

- (40)a. A . . . A . . . A (uniform A-chain)
 b. A' . . . A' . . . A' (uniform A'-chain)
 c. A' A (operator-variable chain)
- (41) *A' . . . A' . . . A

He then suggests as part of the Economy Principle that deletion of an intermediate trace can apply only as a "last resort," that is, only when it is necessary to create a legitimate chain. Given these proposals, the intermediate trace in (36) cannot be deleted since without such deletion the chain headed by *how* is already a legitimate chain of the type (40b). On the other hand, the chain of *what* in (39) has the form of (41). In this case, the intermediate position of the chain must be deleted to create a legitimate chain of the type (40c). Hence, the deletion applies to the intermediate trace. The contrast between (35) and (38) is thus accounted for.

Chomsky's proposals on the ECP remove one obstacle to the analysis of (29) illustrated in (34). (29) and (34) are repeated below in (42) and (43) respectively.

- (42) ??John-wa [NP [IP nani-o naze katta] hito] -o
 -Top what-Acc why bought person-Acc
 sagasiteru no
 looking-for Q
 'Q John is looking for [the person [that bought what why]]'



As noted above, the NP containing *naze* 'why' and *nani* 'what' in (43) must move out of the complex NP and be in the matrix CP Spec at LF. Hence, if a trace cannot be licensed at an intermediate stage of the derivation, this analysis clearly fails. However, given the proposals in Chomsky (1989), this problem disappears. In (43), *nani* and *naze* can license t_i and t_k respectively. Then, after the NP containing the two *whs* moves to the matrix CP

Spec, the intermediate trace can delete. At LF, all traces are (or have been) licensed, and hence satisfy the antecedent government requirement.

The remaining problem, then, has to do with the status of the VP-adjoined position in (43). As noted above, if scrambling is uniformly A'-movement, as proposed in Saito (1985), then the desired licensing by antecedent government should be impossible, since it is necessary to prohibit antecedent government from an A'-adjoined position to rule out examples such as (35). However, it is argued in Mahajan (1989) that while long-distance scrambling is necessarily A'-movement, clause-internal scrambling can be either A- or A'-movement. The following examples indicate that his hypothesis applies to Japanese:

- (44)a. ?*[IP [NP Otagai -no sensei]-ga [VP karera-i-o
 each other-Gen teacher-Nom they -Acc
 hihansita]] (koto)
 criticized fact
 '[[Each other's_i teachers] [criticized them_i]]'
- b. ?[IP Karera-o_i [IP [NP otagai_i -no sensei]-ga
 they -Acc each other-Gen teacher-Nom
 [VP t_i hihansita]]] (koto)
 criticized fact
 'Them_i, [[each other's_i teachers] [criticized t_i]]'
- (45)a. *[IP [NP Otagai_i -no sensei]-ga [VP [CP [IP Hanako-ga
 each other-Gen teacher-Nom -Nom
 [VP karera-i-o hihansita]] to] itta]] (koto)
 they -Acc criticized Comp said fact
 '[[Each other's_i teachers] [said [that [Hanako criticized them_i]]]]'
- b. *[IP Karera-o_i [IP [NP otagai_i -no sensei]-ga
 they -Acc each other-Gen teacher-Nom
 [VP [CP [IP Hanako-ga [VP t_i hihansita]] to] itta]]] (koto)
 -Nom criticized Comp said fact
 'Them_i, [[each other's_i teachers] [said [that [Hanako criticized t_i]]]]'

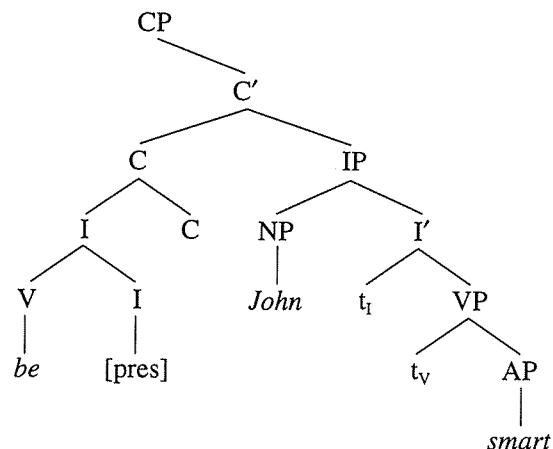
(44b) shows that a phrase moved by clause-internal scrambling can serve as an A-binder for a lexical anaphor. (45b), on the other hand, shows that a phrase moved by long-distance scrambling does not have this property.

Mahajan's hypothesis is thus confirmed.¹⁸ And given this hypothesis, the scrambled object in (43) can be in an A-position.

Although antecedent government is impossible from an A'-adjoined position, it seems possible from a head-adjoined position (i.e., a position adjoined to a head position). Let us consider (46), whose structure is shown in (47).

(46) Is John smart

(47)



According to the analysis proposed in Chomsky (1986, 1989), the verb *be* in (47) adjoins to I, and then the V-I complex adjoins to (or substitutes for) C. Here, the trace of the verb cannot be antecedent governed from the position of C: if such antecedent government were possible, then examples such as (48) would be allowed, as discussed in detail in Travis (1984).

(48) *Be John will t_v smart

Thus, t_v must be antecedent governed and licensed at the point V adjoins to I. And the antecedent governor, in this case, must be the V adjoined to I. Hence, antecedent government from a head-adjoined position should be possible. The analysis illustrated in (43), then, indicates that A-positions are grouped with head-positions in this respect. I will hence assume that antecedent government is possible from head-adjoined positions and A-adjoined positions, but not from A'-adjoined positions.¹⁹ Then, in (43), the scrambled *nani* licenses t_i , and *naze*, after it is adjoined to *nani* in an A-position, licenses t_k . The NP containing the two *whs* can adjoin again to the VP and license the trace of the "complex *wh*-phrase" before moving on to the matrix CP Spec. Since nothing prevents the higher VP-adjoined

position from being an A'-position, the intermediate trace in this position can delete. Thus, the absence of ECP effects in (42) is accounted for.

Note here that this adjunction analysis, when combined with Watanabe's syntactic *wh*-movement hypothesis, allows us to attribute the marginality of (42) to Subjacency. As is well known, examples such as (49) are perfect and contrast sharply with those like (28). (See Huang (1982).)

(49) John-wa [_{NP} [_{IP} *nani* -o katta] hito] -o sagasiteru no
 -Top what-Acc bought person-Acc looking-for Q
 'Q John is looking for [the person [that bought what]]'

This fact raises a potential problem for the syntactic *wh*-movement hypothesis. For examples of this kind, Watanabe (1991) assumes the pied-piping hypothesis, along the lines of Nishigauchi (1986). More specifically, he assumes that the complex NP (DP) in (49) can itself be the *wh*-phrase: an empty operator moves in syntax from the Spec position of the complex NP (DP), and the complex NP (DP) is adjoined to the operator at LF. But note that the adjunction analysis of (42) makes sense only when the embedded object *wh nani* 'what', and not the whole complex NP (DP), is construed as a *wh*-phrase. The adjunct *wh naze* 'why' adjoins to *nani*, and they together move to the matrix CP Spec in LF. Hence, the LF of this example should be as in (50).

(50) [_{CP} [_{NP} [_{NP} [_{ADVP} *naze*]_j] [_{NP} *nani*]_i]_i] [_{NP} Op]_i] [_{IP} . . . [_{NP} [_{IP} . . .
 t_i . . . t_j . . .] . . .] . . .]]

Here, the empty operator originates from *nani* within the complex NP (DP) and moves to the matrix CP Spec at S-structure. Thus, (42) must violate Subjacency at S-structure if it is to avoid an ECP violation at LF.

As shown above, Chomsky's proposals on the ECP and Mahajan's hypothesis on scrambling make the analysis illustrated in (43) possible. And this adjunction analysis automatically extends to the initial example of the higher-*wh* effect in (25), repeated below in (51).

(51) Dare-ga naze *nani*-o katta no
 who -Nom why what-Acc bought Q
 '*What did who buy why'

Here, *dare* 'who', being the subject, is in an A-position. Hence, *naze* 'why' can adjoin to this *wh* and license its trace from the adjoined position.²⁰ The analysis proposed here, thus, makes Watanabe's (1991) (27), repeated in (52), superfluous.

(52) There is only one *wh*-relation per [+wh] Comp.

In the following subsection, I will present two pieces of supporting evidence for this analysis.

3.2. Clause-Boundedness of the Effect

In this section, I will present two additional facts concerning the higher-*wh* effect in Japanese and show that they follow from the adjunction analysis proposed above.

Let us first consider the following examples:

(53)a. *Naze dare-ga Mary-ni [_{CP} John-ga sono hon -o
 why who-Nom -to -Nom that book-Acc
 katta to] itta no
 bought Comp said Q

'Q who told Mary [that John bought that book] why'

b. *Mary-ni_i naze dare-ga *t_i* [_{CP} John-ga sono hon -o
 -to why who-Nom -Nom that book-Acc
 katta to] itta no
 bought Comp said Q

c. Dare-ni_i naze dare-ga *t_i* [_{CP} John-ga sono hon -o
 who-to why who-Nom -Nom that book-Acc
 katta to] itta no
 bought Comp said Q

'Q who told who [that John bought that book] why'

(53a) violates the ECP at LF due to rigidity/relation preservation, exactly as the simple example in (18b), repeated below in (54).

(54) *John-ga naze nani-o katta no
 -Nom why what-Acc bought Q
 '*What did John buy why'

In (53b), the goal argument *Mary-ni* is scrambled to the sentence-initial position, and as expected this scrambling does not affect the grammatical status of the example. In (53c), the *wh dare* 'who' is substituted for *Mary*. Again, as expected, the example becomes grammatical. The adjunct *wh naze* 'why' can adjoin to the scrambled *wh* and license its trace from the adjoined position.

Let us now compare (55a–b) with (53b–c).

(55)a. *Sono hon -o_i naze dare-ga Mary-ni [_{CP} John-ga *t_i*
 that book-Acc why who-Nom -to -Nom
 katta to] itta no
 bought Comp said Q

b.??*Nani-o_i naze dare-ga Mary-ni [_{CP} John-ga *t_i*
 what-Acc why who-Nom -to -Nom
 katta to] itta no
 bought Comp said Q

'Q who told Mary [that John bought what] why'

(55a) is derived from (53a) by scrambling the embedded object to the initial position of the matrix clause. And in (55b), the *wh nani* 'what' is substituted for the scrambled object *sono hon* 'that book'. But this example, in sharp contrast with (53c), shows virtually no improvement over (53a). It seems, then, that a *wh* preposed by long-distance scrambling fails to save *naze* 'why' in an ECP configuration.²¹

This generalization is confirmed by the following examples:

(56)a. *Kimi-wa [_{NP} [_{IP} naze dare-ni [_{CP} John-ga sono hon -o
 you -Top why who-to -Nom that book-Acc
 katta tte] itta] hito] -o sagasiteru no
 bought Comp said person-Acc looking-for Q

'Q you are looking for [the person [that told who [that John bought that book] why]]'

b.??*Kimi-wa [_{NP} [_{IP} dare-ni_i naze *t_i* [_{CP} John-ga sono
 you -Top who-to why -Nom that
 hon -o katta tte] itta] hito] -o sagasiteru no
 book-Acc bought Comp said person-Acc looking-for Q

(57)a. *Kimi-wa [_{NP} [_{IP} naze Mary-ni [_{CP} John-ga nani -o
 you -Top why -to -Nom what-Acc
 katta tte] itta] hito] -o sagasiteru no
 bought Comp said person-Acc looking-for Q

'Q you are looking for [the person [that told Mary [that John bought what] why]]'

- b. *Kimi-wa [NP [IP nani-o_i naze Mary-ni [CP John-ga t_i
 you -Top what-Acc why -to -Nom
 katta tte] itta] hito] -o sagasiteru no
 bought Comp said person-Acc looking-for Q

The adjunct *wh naze* 'why' is contained in a complex NP in (56a), and hence this example is straightforwardly ruled out by the ECP. As (56b) indicates, if we prepose another *wh* to the position in front of *naze* by clause-internal scrambling, the example shows clear improvement. The complex NP in (57a) contains *naze*, and hence this example is ruled out by the ECP exactly as (56a). But as shown in (57b), there is no improvement when we prepose another *wh* to the position in front of *naze* by long-distance scrambling.²²

This difference between clause-internal scrambling and long-distance scrambling is unexpected if we simply assume the descriptive generalization that an additional higher *wh* saves *naze* in an ECP configuration. But it is exactly what is predicted by the adjunction analysis proposed in the preceding subsection. Recall that according to Mahajan's hypothesis, clause-internal scrambling, but not long-distance scrambling, can be A-movement. And it was assumed above, crucially, that antecedent government is possible from an A-adjoined position but not from an A'-adjoined position. Hence, *naze* in (56b) can adjoin to the scrambled *wh* and license its trace from this position since the scrambled phrase can be in an A-position. On the other hand, (57b), even if *naze* adjoins to the scrambled *wh*, it fails to license its trace. This is so since the scrambled *wh* is preposed by long-distance scrambling and therefore must be in an A'-position. Thus, the contrast between (56b) and (57b) directly follows from the adjunction analysis proposed in the preceding subsection.

There is another case in which a higher additional *wh* fails to save *naze* 'why' in an ECP configuration. The following examples illustrate this case:

- (58)a. *Mary-ga [CP John-ga naze nani-o katta to]
 -Nom -Nom why what-Acc bought Comp
 omotteru no
 think Q
 'Q Mary thinks [that John bought what why]'
- b. Mary-ga [CP dare-ga naze nani-o katta to]
 -Nom who-Nom why what-Acc bought Comp
 omotteru no
 think Q
 'Q Mary thinks [that who bought what why]'

- c. ?*Dare-ga [CP John-ga naze nani-o katta to]
 who-Nom -Nom why what-Acc bought Comp
 omotteru no
 think Q
 'Q who thinks [that John bought what why]'

(58a) contains (54) as its embedded clause and is ruled out by the ECP and rigidity/relation preservation exactly as (54). (58b) contains (51) as its embedded clause and can be analyzed in the same way as (51). The potentially offending *wh naze* 'why' can adjoin to *dare* 'who' and license its trace from the adjoined position. The interesting case is (58c). In this example, the higher additional *wh dare* appears in the matrix subject position, instead of the embedded subject position. The example may be slightly better than (58a) but has basically the same status and contrasts sharply with (58b). The examples in (58b) and (58c), then, indicate that the higher additional *wh* must be a clause-mate of the potentially offending *naze* 'why'. This generalization, like the one illustrated in (56)–(57), may seem rather surprising. But it is also expected under the adjunction analysis proposed in the preceding subsection.

Note first that in (58b–c) the higher *wh* is in a subject position and hence is in an A-position. Thus, it is reasonable to assume that adjunction to this *wh* involves A-movement. And it is known on independent grounds that A-movement is impossible across a CP. A relevant example, (37), is repeated below in (59).

- (59) *John_i seems that it was told t_i that Mary is a genius

As noted above, this example violates the ECP since the trace t_i fails to be antecedent governed: the antecedent *John* is "too far" from the trace. Here, the direct adjunction of *naze* 'why' to *dare* 'who' in (58c) can be ruled out in exactly the same way. Even if the adjunct *wh naze* adjoins to the matrix subject *wh dare*, it cannot antecedent govern and license its trace from that position.²³ There is another possible LF derivation of (58c) that must be considered. Suppose that *naze* moves successive-cyclically through the embedded CP Spec and then adjoins to *dare*, as illustrated in (60).

- (60) . . . [IP [NP [ADVP naze]_j [NP dare]_i]_i . . . [CP t'_j [IP . . . t_j . . .

In this case, *naze* creates a configuration of 'improper movement', exemplified in (61) and discussed in detail in May (1981).

- (61)a. *Mary_i is likely [CP t'_i [IP John saw t_i]]
 b. *Mary_i is likely [CP t'_i [IP t_i saw John]]

naze in (60) is moved first to an A'-position and then to an A-position, exactly as *Mary* in (61). Hence, the adjunction of *naze* to *dare* is ruled out in (58c) under either derivation.^{24, 25}

In this section, I presented an adjunction analysis of the higher-*wh* effect and discussed two cases of clause-boundedness of the effect as supporting evidence for the analysis. If the analysis is correct, it provides strong support for Chomsky's (1989) proposal that traces can be licensed within the derivation "as they are created." Further, it provides an additional argument for Mahajan's (1989) hypothesis that clause-internal scrambling, but not long-distance scrambling, can be A-movement. In the following section, I will examine its implications for Chomsky's (1986) theory of bounding.

4. IMPLICATIONS FOR THE ADJUNCTION SITE THEORY

The adjunction analysis of the additional-*wh* effect presented above crucially assumes that subjects and scrambled objects are possible adjunction sites. Two relevant examples are shown below.

(62)a. *John-ga naze nani-o katta no
-Nom why what-Acc bought Q

'*What did John buy why'

b. Dare-ga naze nani-o katta no
who-Nom why what-Acc bought Q

'*What did who buy why'

(63)a. *John-ga sore-o naze dare-ni watasita no
-Nom it -Acc why who-to handed Q

'*Who did John hand it to why'

b. John-ga nani-o naze dare-ni watasita no
-Nom what-Acc why who-to handed Q

'*Who did John hand what to why'

The adjunct *wh naze* 'why' avoids potential ECP violation by adjoining to the subject *wh dare* 'who' in (62b) and to the scrambled object *wh nani* 'what' in (63b). The analysis presented above, then, clearly must have some implications for the constraints on adjunction sites suggested in Chomsky (1986). In this section, I will first briefly discuss Chomsky's (1986) theory of bounding, which is based on these constraints, and then present supporting evidence for it.

4.1. On the Category/Segment Distinction

As is well known, the bounding theory proposed in Chomsky (1986) is an extension of Huang's (1982) CED, which is in turn a modification of the condition proposed in Kayne (1981). The CED states that a maximal projection constitutes a barrier for movement when it is not lexically governed. It thus accommodates examples of the following kind:

(64)a. ?*Who_i did [_{NP} a picture of *t_i*] please you

b. ?*Who_i did you leave [_{PP} after you saw *t_i*]

c. ?*What_i did you see the man [_{CP} who bought *t_i*]

(64a) is an example of extraction out of a subject. Since the subject of a finite clause is not lexically governed, the example is straightforwardly accounted for by the CED. (64b) involves extraction out of an adjunct. The CED readily accommodates this example since adjuncts also are not lexically governed. (64c), which involves extraction out of a relative clause, is accounted for in the same way as (64b), since relative clauses are modifiers, and, hence, adjuncts.

Chomsky (1986) proposes, roughly, that barriers for extraction are not those defined in the CED but the maximal projections immediately dominating them. A simplified definition is given below in (65).²⁶

(65)a. X is a BC for Y =_{df} (1) X is a maximal projection dominating Y, and
(2) X is not lexically governed.

b. X is a barrier for Y =_{df} X is the first maximal projection dominating a BC for Y.

Then, the subject NP and the adjunct PP in (64a) and (64b) are BCs, and the IPs immediately dominating them are the barriers. Similarly, in (64c), the relative clause is a BC, and the complex NP is the barrier. This revision immediately solves a potential problem for the CED illustrated by the example in (66).

(66) [_{CP} Who_i [_{IP} *t_i* left]]

If IP is a maximal projection, as argued in Stowell (1981), then the CED predicts falsely that the IP in (66) is a barrier. But according to (65), the IP is only a BC, and the CP dominating it is the barrier. Thus, the movement in (66) does not cross any barrier and is correctly allowed.

The definition of barrier in (65), in distinction with those in Huang (1982)

and Kayne (1981), also enables us to subsume the *wh*-island effect under the same bounding condition. Let us consider (67).

(67) ?*Who_i does John wonder [_{CP} what_j [_{IP} Mary gave *t_j* to *t_i*]]

As stated explicitly in Chomsky (1981), the *wh*-island effect is observed when a movement crosses a CP/IP pair. And this fact directly follows from the definition in (65). In (67), the embedded IP is a BC, and hence the embedded CP is a barrier for the movement of *who*. Thus, this movement inevitably crosses a barrier. Note that (65) allows successive-cyclic movement through CP Spec, which is illustrated in (68).

(68) [_{CP} Who_i does [_{IP} John think [_{CP} *t_i'* [_{IP} Mary saw *t_i*]]]]

The embedded IP, by definition, can be a BC only for elements that it dominates. Hence, it is not a BC for *who* once the *wh* moves to the embedded CP Spec position. Then, the embedded CP is not a barrier for the movement from the embedded CP Spec to the matrix CP Spec.

One problem that Chomsky (1986) inherits from Kayne (1981) and Huang (1982) has to do with the status of the VP node. Provided that Infl does not lexically govern VP, the following example is incorrectly ruled out:

(69) [_{CP} What_i did [_{IP} John [_{VP} buy *t_i*]]]

In (69), the VP is a BC, and hence the IP constitutes a barrier for the movement of *what*. Discussing this problem, Chomsky (1986) notes first that nothing prevents the *wh*-movement in (69) from proceeding through the VP-adjoined position as in (70).

(70) [_{CP} What_i did [_{IP} John [_{VP} *t_i'* [_{VP} buy *t_i*]]]]

Then, adopting May's (1985) proposal on adjunction structures, he suggests that VP adjunction nullifies the effect of VP as a BC. According to May's proposal, the two VPs in (70) are two segments of a single category. The VP-adjoined position, therefore, has a peculiar status: it is neither completely inside (dominated by) nor completely outside (excluded by) the category VP. Chomsky suggests, then, that the initial movement of *what* to the VP-adjoined position does not involve extraction out of the category VP. And more importantly, he suggests that the category VP is not a BC for a phrase in the VP-adjoined position since it does not dominate this position. It follows from this hypothesis that the IP does not constitute a barrier for the second movement in (70).

The account for (69) illustrated above implies that the effect of any BC can be nullified by adjunction. But the subject in (64a), the adjuncts in (64b-c), and the IP in (67) must function as BCs, if we are to maintain

the account for the island effects. And here arises the necessity to constrain possible adjunction sites. Descriptively speaking, adjunction to subjects, adjuncts, and IPs must be prohibited.²⁷

In Lasnik and Saito (1992), we argued that the category/segment distinction is employed only to account for the transparency of VP for movement, and also raised empirical problems for Chomsky's account based on this distinction. We first argued that English topicalization can involve IP adjunction, as proposed in Baltin (1982), and hence that adjunction to IP is possible. Then, we presented examples of multiple topicalization, as in (71), as direct evidence against the category/segment distinction.

(71) ??[_{IP} [_{PP} On the table]_i [_{IP} [_{NP} that book]_j [_{IP} John put *t_j* *t_i*]]]

This example is straightforwardly accounted for if the three IPs are considered independent categories. The lowest IP is a BC, and hence the second IP is a barrier. Thus, the movement of PP crosses a barrier. On the other hand, if the three IPs are segments of a single category, and only categories can be BCs, as proposed in Chomsky (1986), then it is impossible to account for the marginality of this example on the basis of (65). Hence, (71) raises doubts for the category/segment distinction and, consequently, for Chomsky's (1986) analysis of (69).

However, this controversy concerning the category/segment distinction seems to have lost most of its significance due to more recent developments. Let us, for example, consider Chomsky and Lasnik (1991). First, they entertain the hypothesis that Infl behaves as a lexical category in the definition of barriers. More precisely, they suggest that heads with lexical features (i.e., lexical heads, and inflectional heads with features of a verb) free their complements from barrierhood. If we translate this idea into the definition in (65), it means that Infl, like lexical heads, lexically governs its complement and frees it from Bhood. Since this by itself accounts for the transparency of VP for movement, the initial motivation for assuming the VP adjunction analysis and the category/segment distinction disappears.

Secondly, Chomsky and Lasnik propose to explain the *wh*-island effect without appealing to barriers. More specifically, they develop Rizzi's (1990) relativized minimality and propose to derive the effect ultimately from the following principle of Economy of Derivation:

(72) Minimize chain links.

Roughly, *who* in (67) moves across a possible landing site, i.e., the embedded CP Spec, and hence violates the condition that movement should construct the shortest link. Given this move, the argument of Lasnik and Saito (1992) against the category/segment distinction is also considerably

weakened. Although the exact outcome depends on the precise formulation of (72), it seems reasonable to assume that it extends to the example of multiple topicalization in (71). In this example, a PP is topicalized over a possible landing site, i.e., the lower IP-adjoined position. Hence, it is not clear at this point that (71) involves movement across a barrier, and consequently there is no strong reason to suppose that each IP in this example constitutes an independent category.

It seems at this point that the initial motivation either to adopt or to reject the category/segment distinction no longer holds. However, there seem to be some phenomena that favor the proposal in Chomsky (1986).²⁸ In the remainder of this subsection, I will briefly discuss two such phenomena. First, as is well known, multiple scrambling is possible. Thus, (73b) and (73c) are both perfectly grammatical.

- (73)a. [_{IP} John-ga [_{VP} Mary-ni sono hon -o watasita]]
 -Nom -to that book-Acc handed
 'John handed that book to Mary'
- b. [_{IP} Sono hon -o_i [_{IP} Mary-ni_j [_{IP} John-ga [_{VP} t_j t_i watasita]]]]
 that book-Acc -to -Nom handed
- c. [_{IP} Mary-ni_j [_{IP} sono hon -o_i [_{IP} John-ga [_{VP} t_j t_i watasita]]]]
 -to that book-Acc -Nom handed

This fact is totally unexpected if each IP in an IP adjunction structure constitutes an independent category, and the marginality of (71) is due to movement across a barrier. On the other hand, it is at least not surprising if the marginality of (71) is attributed solely to the Economy Principle. Scrambling, being an optional movement operation, seems to be immune to at least some kinds of economy considerations.²⁹

Secondly, it is argued in Lasnik and Saito (1992) that no barrier is crossed when a *wh*-phrase is extracted out of a topic in English. Let us consider the following example:

- (74) ??Who_i does John believe [_{CP} t_i' [_{C'} that [_{IP} [_{NP} pictures of t_i]_j, Mary bought t_j]]]

This example is marginal even for those who allow topicalization quite freely.³⁰ But the point is that its marginality can be attributed to independent factors: the embedded topic is non-specific, and, further, the example, like (75), involves extraction out of a non-right branch constituent.³¹

- (75) ??Who_i did John [_{VP} give [_{NP} a picture of t_i] [_{PP} to Mary]]

Thus, it seems reasonable to suppose that (74) indeed involves no movement across a barrier. But given this conclusion, the non-barrierhood (or non-BChood) of the topicalized NP is quite mysterious since it is obviously not lexically governed. Having rejected the category/segment distinction, we made the rather blatant stipulation in (76) to accommodate this fact.

- (76) An A'-binder is not a barrier.

But the fact clearly can be accounted for more elegantly with the category/segment distinction, as noted also in Fiengo et al. (1988). Since the topic is neither a subject nor an adjunct, it is a possible adjunction site. Hence, *who* in (74) can adjoin to the topic NP and then move to the embedded CP Spec. Thus, the theory based on the category/segment distinction predicts correctly that no barrier needs to be crossed in this example. (74), like (73), then, can be taken as evidence for the category/segment distinction.

Note that a theory based on this distinction still needs to assume some constraints on possible adjunction sites. As noted in Fn. 28, if the *wh*-island effect is explained by (72), there is no longer any strong reason to prohibit adjunction to IP. I will hence assume that IP adjunction is possible as long as the IP is neither a subject nor an adjunct.³² But we must continue to prohibit adjunction to subjects and adjuncts in English to exclude examples such as (64a-c). It may be thought at this point that this stipulation is too costly if the category/segment distinction is maintained only to accommodate the facts in (73)-(74). In the following subsection, I will argue that there is in fact a correlation between islandhood and (im)possible adjunction sites in Japanese and, by doing so, present a stronger supporting argument for the theory based on the category/segment distinction.

4.2. Islands and (Im)possible Adjunction Sites in Japanese

As noted at the outset of this section, the adjunction analysis of the higher-*wh* effect implies that adjunction to subjects and adjoined phrases is possible in Japanese. However, this analysis also needs to assume a constraint on possible adjunction sites. Let us consider (62a), repeated below as (77).

- (77) *John-ga naze nani-o katta no
 -Nom why what-Acc bought Q
 '*What did John buy why'

I have assumed, following Watanabe (1991), that rigidity/relation preservation forces this example to have the following LF representation:

(78) [CP [NP [ADVP naze]_j] [NP [NP nani]_i] [NP Op]_i]_i] [IP John-ga *t_j* *t_i* katta]]

In this LF, the trace of *naze* 'why' *t_j* is not antecedent governed and hence is in violation of the ECP.

However, if *nani* 'what' can adjoin to *naze* in the first step of the LF derivation of (77), the following LF should also be possible:

(79) [CP [NP [ADVP [NP nani]_i] [ADVP naze]_j]_j] [NP Op]_j] [IP John-ga *t_j* *t_i* katta]]

The empty operator is moved in the syntax from *naze* to CP Spec. Then in LF, *nani* adjoins to *naze*, and the ADVP containing both *whs* adjoins to the operator in CP Spec. Note here that there is no violation of rigidity/relation preservation. The trace of *naze* asymmetrically seg-commands that of *nani*, and the *wh*-phrase *naze* asymmetrically seg-commands the *wh*-phrase *nani*. Further, the trace of *naze* is appropriately licensed in the representation in (79). The adjunct trace is antecedent governed exactly as in the LF of the simple example in (80).³³

(80) John-ga naze sore-o katta no
-Nom why it -Acc bought Q

'Why did John buy it'

But the LF in (79) clearly must be blocked since (77) is ungrammatical. It seems then that *nani* cannot adjoin to *naze*, or, more generally, adjunction to adjuncts is prohibited.

As shown above, the adjunction analysis of the higher-*wh* effect indicates that in Japanese, adjunction is possible to subjects and adjoined phrases but not to adjuncts. The theory of bounding based on the category/segment distinction, then, predicts that adjuncts, but not subjects and adjoined phrases, are islands for movement in Japanese. The prediction is indeed borne out by the facts of scrambling, already widely discussed in the literature. First, as pointed out by Haig (1976) and Harada (1977), scrambling exhibits certain island effects. The effects are weak, for some reason, but scrambling out of relative clauses and adjuncts results in marginality, as shown in (81)–(82).³⁴

(81)a. [IP John-ga [NP [IP *e_j* nani -o katta] hito]_j] -o
-Nom what-Acc bought person-Acc
sagasiteru] no
looking-for Q
'John is looking for [the person [that bought what]]'

b. ??[IP Nani-o_i [IP John-ga [NP [IP *e_j* *t_i* katta] hito]_j] -o
what-Acc -Nom bought person-Acc

sagasiteru]] no

looking-for Q

'What, John is looking for [the person [that bought *t_j*]]'

(82)a. [IP John-ga [PP Mary-ga nani -o katta kara]
-Nom -Nom what-Acc bought because

okotteru] no

angry Q

'John is angry [because Mary bought what]'

b. ?[IP Nani-o [IP John-ga [PP Mary-ga *t_i* katta kara]
what-Acc -Nom -Nom bought because

okotteru]] no

angry Q

'What, John is angry [because Mary bought *t_j*']

The adjunct PP in (82b) is a BC since it is not lexically governed. If adjunction to adjuncts is prohibited, then adjunction cannot nullify the effect of this BC. Hence, we expect this example to be marginal. (81b) is accounted for in the same way since the relative clause IP is an adjunct.

On the other hand, it is noted in Kayne (1983) that there are no subject condition effects in Japanese. The following examples from Saito (1985) confirm this observation:

(83)a. [IP John-ga [NP [IP Mary-ga nani -o katta] koto]-o
-Nom -Nom what-Acc bought fact -Acc

mondai -ni siteru] no

problem-into making Q

'John is making an issue out of [the fact [that Mary bought what]]'

b. ?[IP Nani-o [IP John-ga [NP [IP Mary-ga *t_i* katta] koto]-o
what-Acc -Nom -Nom bought fact -Acc

mondai -ni siteru]] no

problem-into making Q

'What, John is making an issue out of [the fact [that Mary bought *t_j*]]'

- (84)a. [_{IP} John-ga [_{CP} [_{NP} [_{IP} Mary-ga nani -o katta]
-Nom -Nom what-Acc bought
koto]-ga mondai -da to] omotteru] no
fact -Nom problem-is Comp think Q
'John thinks [that [the fact [that Mary bought what]] is a
problem]'
- b. ?[_{IP} Nani-o [_{IP} John-ga [_{CP} [_{NP} [_{IP} Mary-ga *t*_i katta]
what-Acc -Nom -Nom bought
koto]-ga mondai -da to] omotteru]] no
fact -Nom problem-is Comp think Q
'What, John thinks [that [the fact [that Mary bought *t*]] is a
problem]'

(83b) involves scrambling out of a complex NP in object position. The example is marginal since the IP modifier in the complex NP is an adjunct and hence a BC. (84b), which involves scrambling out of a complex NP in subject position, is marginal for the same reason. But it is no worse than (83b). This fact suggests that the subject complex NP in (84b) does not create an extra barrier. And this is exactly what we expect if adjunction to subject is possible. The scrambling in (84b) can proceed via adjunction to the subject complex NP and thus nullify its effect as a BC.

Finally, it is noted in Saito (1985) that scrambling out of a scrambled phrase is possible. The following examples illustrate this generalization:

- (85)a. [_{IP} John-ga [_{CP} [_{IP} [_{CP} Mary-ga sono hon -o katta
-Nom -Nom that book-Acc bought
to]_j [_{IP} Bill-ga *t*_j itta]] to] omotteiru]
Comp -Nom said Comp think
'John thinks that [that Mary bought that book], Bill said'
- b. [_{IP} Sono hon -o_i [_{IP} John-ga [_{CP} [_{IP} [_{CP} Mary-ga *t*_i
that book-Acc -Nom -Nom
katta to]_j [_{IP} Bill-ga *t*_j itta]] to] omotteiru]]
bought Comp -Nom said Comp think
'That book, John thinks that [that Mary bought *t*], Bill said'

The examples in (85) are both awkward, probably due to double/center embedding, but they both seem to be perfectly grammatical. In (85a), the most deeply embedded CP is scrambled within the embedded clause. In (85b), the NP *sono hon* 'that book' is scrambled out of the scrambled CP

to the initial position of the matrix clause. The second example thus shows that scrambling out of a scrambled (adjoined) phrase is possible. This result also is predicted by the theory of bounding based on the category/segment distinction. The scrambled CP in (85b) is a BC since it is not lexically governed. But since adjunction to adjoined phrases is possible, the effect of this BC can be circumvented by adjunction.

It was shown above that given an independently motivated constraint on possible adjunction sites in Japanese, the theory based on the category/segment distinction makes exactly the correct predictions concerning island effects in this language. This result, then, provides strong support for this theory of bounding.

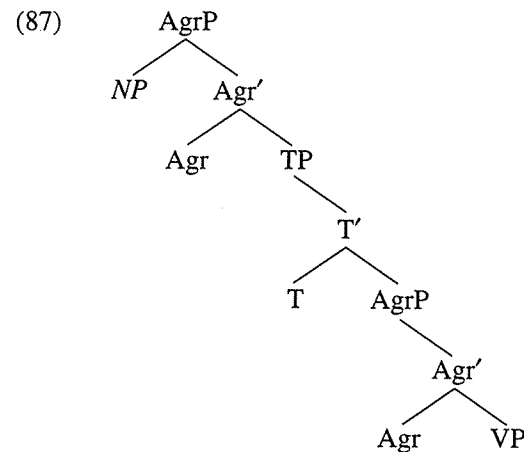
Before I conclude this section, I will briefly discuss two related issues. The first has to do with whether it is possible to check the higher-*wh* effect in English and come up with independent motivation for the constraints on possible adjunction sites in this language. As far as I can see, it is very difficult to come up with relevant data. But to the extent that it is possible, the facts seem to be consistent with the analysis proposed in this paper. For example, as noted above, the impossibility of extraction out of a subject implies that adjunction to subject is impossible in English. And the following examples indicate that an adjunct *wh* cannot be adjoined to a subject *wh* in LF:

- (86)a. ?Who_i *t*_i said (that) who left early
b. *Who_i *t*_i said (that) who left early why

The first example is not perfect for some reason but does not have the status of an ECP violation.³⁵ Now, if *why* in (86b) can adjoin to *who* in the embedded subject position and license its trace from the adjoined position in LF, then we falsely predict that this example, too, should not have the status of an ECP violation. Hence, the ungrammaticality of (86b) is consistent with the hypothesis that adjunction to subject is impossible in English.

The second issue has to do with the difference between English and Japanese with respect to possible adjunction sites. According to the analysis presented above, adjunction to adjunct is impossible in both languages, but adjunction to subject is excluded only in English. For the adjunct case, I tentatively assume here that the impossibility of adjunction is related to its nature as a predicate: if a phrase is adjoined to an adjunct, it will be falsely assigned a theta-role (or modified) by the adjunct. Note that given the VP-internal subject hypothesis, VPs are not predicates, and thus this does not exclude adjunction to VP. Then, what about the subject case? I

would like to suggest here that the difference between English and Japanese is related to the presence/absence of agreement. Let us assume the following sentential structure for English, proposed in Chomsky (1989):³⁶



According to the analysis in Chomsky (1989), the subject NP, which originates within the VP, moves to the Spec position of the higher Agr to have its nominative Case checked through Spec/head agreement. Here, suppose that not only the NP in the Agr Spec position but also any phrase adjoined to this NP participates in Spec/head agreement with Agr. Then, if this agreement requires the nominative feature, it follows that phrases without this feature, e.g., the adjunct *why*, cannot adjoin to the subject NP. This analysis, although speculative, seems plausible, since apparently only *wh*-phrases can adjoin to the Spec of C with the feature [+wh].

Then, why is adjunction to subjects possible in Japanese? It is well known that Japanese lacks subject-verb agreement. Further, it is argued in Saito (1982b, 1985), Fukui (1986), Kuroda (1978, 1988), among others, that nominative Case in Japanese does not involve any kind of agreement, but is contextually inserted. Among the evidence presented for this claim is the fact, noted in Kuno (1973b), that Japanese allows multiple-subject sentences. An example is given in (88).

- (88) Yama -ga ki -ga kirei -da
 mountain-Nom tree-Nom pretty-is

'It is the mountains where trees are pretty'

Let us assume for concreteness, along the lines of Saito (1982b), that (88) has the structure shown in (89) and that the nominative Case marker *ga* is attached to any XP immediately dominated by TP.

- (89) [_{TP} Yama-ga [_{TP} ki-ga [_{T'} kirei-da]]]

Then, subjects in Japanese are in TP Spec and do not participate in Spec/head agreement with the head T. And given this hypothesis, it is not at all surprising that adjunction to subjects is allowed in this language. Since the subject does not agree with an inflectional head, there is no agreement requirement on a phrase adjoined to the subject.³⁷

5. CONCLUSION

In this paper, I have proposed an analysis for the higher-*wh* effect in Japanese. According to this analysis, the adjunct *wh naze* in an ECP configuration can adjoin to the higher *wh* and license its trace from the adjoined position. This analysis, if correct, provides support for Chomsky's conception of the ECP, in particular for his idea that traces can be licensed "as they are created." I also discussed two cases of clause-boundedness of the higher-*wh* effect as supporting evidence for the analysis. The fact that this effect is observed with higher *whs* preposed by clause-internal scrambling, but not with those preposed by long-distance scrambling, provides strong support for Mahajan's proposal that clause-internal scrambling, and only clause-internal scrambling, can be A-movement. I then showed that the proposed analysis of the higher-*wh* effect implies a specific constraint on possible adjunction sites and that this constraint, together with the bounding theory based on the category/segment distinction, makes correct predictions for bounding effects in Japanese. It was thus argued that the proposed analysis provides support for the idea in Chomsky (1986) that the effect of a BC can be circumvented by adjunction.

APPENDIX: A SPECULATIVE NOTE ON THE ADDITIONAL-WH EFFECT IN ENGLISH

One of Watanabe's (1991) goals, as discussed in section 2, was to provide a uniform analysis for the higher-*wh* effect in Japanese and the additional-*wh* effect in English. Since I argued for an alternative analysis for the former effect, a question arises regarding the treatment of the latter. Although I do not have a proposal at this point, I will briefly discuss two possible approaches in this appendix.

As noted in Kayne (1983), an English sentence containing a *wh* in an ECP configuration can be improved considerably by the addition of another *wh* in a lower position. The following examples confirm this generalization:

(90)a. *Who_i t_i bought the book why

b. Who_i t_i bought what why

(91)a. *Who_i t_i went there why

b. Who_i t_i went where why

In both (90a) and (91a), the LF *wh*-movement of *why* creates a trace in violation of the ECP. But as shown in (90b) and (91b), the addition of a *wh*-phrase in a position lower than *why* somehow saves the examples. Pesetsky (1982) points out that a similar effect is observed with examples of "pure superiority violation." The examples in (14) from Watanabe (1991), repeated below in (92), illustrate this generalization.

(92)a. ?*What books_i do you expect who to give t_i to Bill

b. What books_i do you expect who to give t_i to whom

The phenomenon in question can be stated, informally, as in (93).

(93) When there is an offending *wh* in situ, the addition of a *wh* in a lower position improves the example.

The analysis of the Japanese higher-*wh* effect proposed in this paper suggests a possible approach to this phenomenon, different from those pursued in Kayne (1983), Pesetsky (1982), and Watanabe (1991). Suppose that the lower *whs* in (90b) and (91b) play the same role as the higher *whs* in Japanese. Then, they must move to an A-position in LF so that *why* can adjoin to them and license its trace from the adjoined position. There are a few possibilities for the relevant A-position, e.g., the VP-adjoined position, the TP Spec position, and the TP-adjoined position. If we adopt the TP Spec position, for concreteness, then the trace of *why* in (90b) will be licensed in the following configuration in LF:

(94) [_{CP} [_{NP} who]_i [_{AGRP} t_i . . . [_{TP} [_{NP} [_{ADV} why]_j [_{NP} what]_k]_k . . . [_{VP} [_{VP} bought t_k] t_j]]]]

Here, *what* first moves into the TP Spec position, and then *why* adjoins to *what* and licenses its trace from this position. The complex *wh* containing *why* and *what* then adjoins to TP and licenses the trace in TP Spec. After it adjoins to *who* in CP Spec, the trace in the TP-adjoined position deletes to satisfy the Principle of Full Interpretation.

This approach predicts a locality requirement on the offending *wh* and the lower *wh*: the lower *wh* must be able to move to an A-position that c-commands the offending *wh*. Although the relevant data are far from clear,

examples such as the following suggest that this prediction is borne out:

(95) Who_i t_i said that John solved which problem how

The example is marginal. But the marginally possible reading is the one in which *how* is construed with the embedded clause. The example seems to be out with the reading where *how* is construed with the matrix clause. This is what is predicted since *which problem* must undergo A-movement out of the embedded CP to save *how* in the matrix clause.

It of course remains to be seen whether this approach can be maintained on more general grounds. And at this point, it is not clear how it can be extended to the case of superiority illustrated in (92).³⁸ Such extension seems to require a reconsideration of the superiority phenomenon in general and possibly a revised analysis of the higher-*wh* effect in Japanese.

Watanabe's (1991) syntactic *wh*-movement hypothesis raises a different possibility: it is possible that the additional-*wh* effect in English is to be grouped together, not with the higher-*wh* effect, but rather with the lower-*wh* effect in Japanese. As noted at the outset of this paper, not only the addition of a higher *wh* but also that of a lower *wh* can save examples such as (96a–b).

(96)a. *John-ga naze nani-o katta no
-Nom why what-Acc bought Q

'*What did John buy why'

b. *Naze dare-ga soko-ni itta no
why who-Nom there-to went Q

'*Who went there why'

(97a) and (97b) illustrate the higher-*wh* effect and the lower-*wh* effect respectively.

(97)a. Dare-ga naze nani-o katta no
who -Nom why what-Acc bought Q

'*What did who buy why'

b. ?Naze dare-ga doko -ni itta no
why who-Nom where-to went Q

'Who went where why'

As noted in Fn. 2, (97b), unlike (97a), seems to require a pause between the *wh*-phrases, and the higher-*wh* effect and the lower-*wh* effect seem to represent different kinds of phenomena.

It appears difficult, at first sight, to assimilate the lower-*wh* effect with the Kayne-Pesetsky generalization in (93). If *naze* 'why' is the offending *wh* in situ in (96b), this example shows that the presence of a lower *wh* does not necessarily lead to improvement. Further, (97b) indicates that the addition of not one but two lower *whs* improves the example. But these problems may disappear under Watanabe's (1991) syntactic *wh*-movement hypothesis for Japanese. Recall his hypothesis that syntactic empty operator movement applies in Japanese exactly as syntactic *wh*-movement in English. According to this hypothesis, syntactic operator movement, of course, applies in both (96b) and (97b). In the case of (96b), rigidity/relation preservation guarantees that the movement is from the lower *wh dare* 'who'. Now, if the *wh*-phrase from which an empty *wh*-operator is moved does not count as a "*wh* in situ" for the purpose of the generalization in (93), then the ungrammaticality of (96b) is expected. In this example, *naze* is the offending *wh* in situ, and there is simply no other *wh* in situ. In addition, the lower-*wh* effect in (97b) falls under the generalization in (93). Suppose that the empty operator movement takes place from the lowest *wh doko* 'where'. Then, this *wh* does not count as a *wh* in situ. However, there is another *wh*, namely, *dare* 'who', which is in situ and is in a position lower than the offending *naze*.

This approach is not implausible since the lower-*wh* effect also exhibits some sort of clause-boundedness, as illustrated in (98).

(98)a. *Naze dare-ga John-ni [_{CP} Mary-ga sono hon -o
 why who-Nom -to -Nom that book-Acc
 katta to] itta no
 bought Comp said Q
 'Q who said to John [that Mary bought that book] why'

b. ?Naze dare-ga dare-ni [_{CP} Mary-ga sono hon -o
 why who-Nom who-to -Nom that book-Acc
 katta to] itta no
 bought Comp said Q
 'Q who said to who [that Mary bought that book] why'

c. *Naze dare-ga John-ni [_{CP} Mary-ga nani-o
 why who-Nom -to -Nom what-Acc
 katta to] itta no
 bought Comp said Q
 'Q who said to John [that Mary bought what] why'

(98a), exactly like (96b), is ruled out by the ECP and rigidity/relation preservation. A lower *wh* is added in the matrix clause in (98b), and this example shows improvement exactly like (97b). On the other hand, (98c), in which a lower *wh* is added in the embedded clause, shows no improvement. Thus, the lower-*wh* effect seems to share some properties with the additional-*wh* effects in (90)–(91).

NOTES

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¹ There seem to be equally many people who accept examples like (1b) and (2b). I will basically ignore this idiolect in the discussion in the text but will come back to it from time to time in footnotes, simply to show that its existence does not necessarily affect the main conclusions of this paper.

² Examples such as (3b) are considered ungrammatical in Watanabe (1991). But I believe that there is no serious conflict in judgment. (3b), unlike (3a), seems to require a pause between the *wh*-phrases, and it is likely that these two examples represent different phenomena.

³ See Kayne (1983) and Pesetsky (1982) for detailed discussion of the additional-*wh* effect in English.

⁴ See Hoji (1985) for detailed discussion of the scope facts illustrated in (6) and (7).

⁵ See Comrie (1987) for extensive discussion on crossing effects in Japanese. In (8) and many other Japanese examples to follow, I substitute the illustration of the rough structure of the example for translation.

⁶ (9c) requires stress on *dono hon*. See Nishigauchi (1986) for discussion on the marginality of the interpretations in (9b) and (9c).

⁷ Watanabe (1991) deals with various aspects of *wh*-questions in Japanese and English, and his theory has extensive empirical coverage. But I will limit the discussion here to his analysis of the contrast in (5) and the higher-*wh* effect.

⁸ (10a), as opposed to (10b), receives independent support from examples such as the following:

(i) Kimi-wa [_{CP} [_{IP} [_{CP} John-ga nani-o katta to]_i [_{IP} dare-ga _{t_i}
 you -Top -Nom what-Acc bought Comp who-Nom
 itta] ka] siritai no
 said Q want-to-know Q
 'Q you want to know [Q [_{CP} that John bought what]_i, who said _{t_i}']

In (i) the *wh nani* 'what' linearly precedes the other *wh dare* 'who'. This example marginally allows the reading in (iia) but not that in (iib), as correctly predicted by (10a).

(ii) a. *Nani* takes matrix scope, and *dare* takes embedded scope.

b. *Dare* takes matrix scope, and *nani* takes embedded scope.

Hence, the clause (a) of (10) seems to hold.

⁹ For discussion of superiority, see, for example, Chomsky (1973), Jaeggli (1982), Pesetsky (1982), Lasnik and Saito (1992), and Lee (1993).

¹⁰ The statement of the principle in (16), as well as the following illustration of its application, is quite informal. See Watanabe (1991) for a more precise and more detailed explanation of the principle.

¹¹ See also Watanabe (1992) on this point.

¹² Note that the particular English example in (20a) violates superiority in addition to Subjacency.

¹³ As noted above, Watanabe assumes the DP hypothesis. But I will freely use 'NP' in place of 'DP' just for ease of exposition.

¹⁴ See Kim (1991) for extensive discussion on the similarities between quantified NPs and *wh*-phrases in Japanese and Korean.

I speculate at this point that those who accept (1b) and (2b) allow the following structures for those examples:

- (i) [_{IP} John-ga [_{VP} naze_i [_{VP} nani-o_j [_{VP} t_i [_{VP} t_j katta]]]]] no
 (ii) [_{IP} Naze_i [_{IP} dare-ga [_{VP} t_i [_{VP} soko-ni itta]]]] no

In both (i) and (ii), *naze* 'why' is scrambled over the other *wh*. Thus, given the nature of scope interpretation in Japanese, we expect that either *wh* can take wide scope. If *naze* takes narrow scope and moves to CP Spec first (or more precisely, adjoins to the operator in CP Spec first), then the examples will have well-formed LF representations. (See Hoji (1985) for an analysis of scope interpretation in Japanese that is consistent with this speculation.) If this speculation is on the right track, then we must explain why those who reject (1b) and (2b) do not allow the representations in (i) and (ii). See Saito (1985) and Hoji (1985) for possibly relevant (and possibly idiolectal) constraints on "string-vacuous" multiple scrambling and adverb scrambling.

¹⁵ In the following discussion, I will assume, though not crucially, that prenominal sentential modifiers in Japanese are not CPs but IPs, as proposed in Murasugi (1990, 1991). See also Sakai (1990) for relevant discussion.

¹⁶ I will return to the marginality of (29) later in this section.

As noted in Fn. 1, there is idiolectal variation with respect to examples such as (1b) and (2b). But as far as I know, there is no such variation for examples like (28). This fact is consistent with the speculation in Fn. 14 that the variation observed with (1b) and (2b) is related to rigidity/relation preservation; (28) violates the ECP because of a barrier, and rigidity does not play any role in this example. The contrast between (28) and (29), as far as I know, obtains for everyone, including those who accept examples such as (1b) and (2b).

¹⁷ See Chomsky and Lasnik (1991) for a more detailed discussion of this proposal.

¹⁸ See Tada (1990) and Saito (1992) for detailed discussion on scrambling in Japanese. I assume, along the lines of these works, that scrambling in Japanese uniformly involves adjunction, regardless of whether it is A- or A'-movement. See also Webelhuth (1989) for much relevant discussion.

¹⁹ It may be possible to combine this stipulation with (i), proposed in Lasnik and Saito (1992), as in (ii).

- (i) Only X⁰ categories can be antecedent governors.
 (ii) Antecedent government is not possible from an operator position.

See Webelhuth (1989) and Saito (1987, 1992) for evidence that VP-adjunction in English and IP-/VP-adjunction in Japanese are non-operator movement.

²⁰ The LF of (51) will be as in (i).

- (i) [_{CP} [_{NP} [_{NP} [_{ADV} naze]_k [_{NP} dare]_i]_l] [_{NP} [_{NP} nani]_j [_{NP} Op]_j]_l] [_{IP} t_i t_k t_j katta]]

Here, *t_k* seg-commands *t_j*, but there is no seg-command relation between *naze* and *nani*. Hence, this LF seems to be in violation of Watanabe's (1991) relation preservation principle. I will tentatively assume the following slightly weakened version of the principle to allow this LF representation:

- (ii) If *t_i* asymmetrically seg-commands *t_j*, then *wh_j* cannot asymmetrically seg-command *wh_i*.

This slight weakening, as far as I can see, has no effect on the analysis of any of the examples discussed above.

²¹ As pointed out in Takahashi (1993), long-distance scrambling of a *wh*-phrase over another *wh*-phrase results in marginality. (He attributes this fact to superiority.) Thus, (i) is somewhat degraded.

- (i) ??Nani-o_i dare-ga naze Mary-ni [_{CP} John-ga t_i katta to] itta no
 what-Acc who-Nom why -to -Nom bought Comp said Q
 'Q who told Mary [that John bought what] why'

According to the adjunction analysis, this example need not violate the ECP. The adjunct *wh naze* can adjoin to the matrix subject *wh dare* and license its trace from the adjoined position. Hence, more precisely, the claim made in the text on long-distance scrambling is based also on the difference between (55b) and (i): the former is substantially worse than the latter and has a clear flavor of an ECP violation.

²² Note that (56a) and (57a), unlike (53a) and (55a), violate the ECP independently of rigidity/relation preservation. As far as I know, the contrast in (56) and (57), unlike that in (53) and (55), obtains even for those who accept (1b) and (2b), exactly as we expect. See Fn. 1, Fn. 14, and Fn. 16 above for discussion on the relevant "idiolectal variation."

²³ Rizzi (1990) proposes to rule out examples such as (59) in terms of relativized minimality: the IP Spec of the intermediate clause blocks the antecedent government of the trace by *John*. The adjunction of *naze* to *dare* in (58c) can be ruled out in the same way. However, this account does not extend to examples such as (i).

- (i) ?*Dare-ga [_{CP} naze dare-ga sore-o katta to] omotteru no
 who-Nom why who-Nom it -Acc bought Comp think Q
 'Q who thinks [that who bought it why]'

This example has the same status as (58c), but no IP Spec position intervenes between the adjunct *wh* and the matrix subject *wh*. Hence, this example indicates that A-movement out of a CP actually crosses a barrier.

²⁴ (60) raises an interesting technical problem with respect to the treatment of improper movement. According to the standard account for (61), proposed in May (1981), these examples are ruled out by Condition (C) of the Binding theory: the initial trace, being created by A'-movement, is an R-expression but is A-bound by the matrix subject. In the case of (60), the relevant configuration obtains at an intermediate stage in the mapping from S-structure to LF but not at either of the two levels. The trace of *naze* is created in LF and hence does not exist at S-structure. Further, the NP containing *naze* and *dare* moves to the matrix CP Spec at LF, and consequently, the chain headed by *naze* contains only A'-positions at this level. Thus, if Condition (C) applies only at levels, May's account does not extend to this case. Here, one possibility is that Condition (C) is an "everywhere condition," as suggested by Lebeaux (1988, 1990). Then, if the trace created by the A'-movement of *naze* is an R-expression, May's account can be maintained for (60). Another possibility is that improper movement is ruled out on independent grounds, e.g., by the Economy of Derivation. Improper movement redundantly creates two chains, first an A'-chain and then an A-chain. Thus, the Economy Condition may in fact be relevant here. See Takahashi (1992) for much relevant discussion on this point.

²⁵ An anonymous reviewer points out that (58c) is "almost perfectly grammatical" for him/her and others. This suggests the possibility that the adjunction of *naze* to a higher *wh* counts as A'-movement, as far as the locality is concerned, and that, for those who reject (58c), examples of this kind are out for an independent reason. If this is correct, we expect the following contrast to obtain even for those who accept (58c):

- (i) a. *John-ga [NP [IP Mary-ga naze hagesiku hihansita] hon]-o
 -Nom -Nom why severely criticized book-Acc
 sagasiteru no
 looking-for Q
 'Q John is looking for [the book [that Mary criticized severely why]]'
- b. ??John-ga [NP [IP dare-ga naze hagesiku hihansita] hon]-o
 -Nom who-Nom why severely criticized book-Acc
 sagasiteru no
 looking-for Q
 'Q John is looking for [the book [that who criticized severely why]]'
- c. *Dare-ga [NP [IP Mary-ga naze hagesiku hihansita] hon]-o
 -Nom -Nom why severely criticized book-Acc
 sagasiteru no
 looking-for Q
 'Q who is looking for [the book [that Mary criticized severely why]]'

In (ic), *naze* and the higher *wh* are separated by an island. Hence, this example, unlike (58c), should be out, even if the adjunction of *naze* to a higher *wh* can be A'-movement. I will not pursue this possibility any further in this paper. But if it turns out to be correct, the paradigm in (i), instead of that in (58), represents the locality of the higher-*wh* effect and provides support for the adjunction analysis.

²⁶ The actual definition of 'barrier' proposed by Chomsky (1986) is more complex. For example, he tries to account for the relative strength of various islands and, consequently, proposes that a BC also counts as a barrier unless it is an IP. He also substitutes 'L-marking', defined below, for 'lexical government' in the definition of BC since he ultimately defines 'government' on the basis of 'barrier'.

- (i) X L-marks Y =_{df} (a) X is a lexical category,
 (b) X theta-marks Y, and
 (c) X, Y are sisters.

The illustration of Chomsky's proposals that follows (65) in the text is informal and also simplified. See Chomsky (1986) for the precise definitions and more accurate accounts of the island effects he proposes.

²⁷ See Chomsky (1986) for an attempt to derive these constraints on adjunction sites.

²⁸ Chomsky and Lasnik (1991), as they appeal to (72) to explain the *wh*-island effect, eliminate the BC/barrier distinction and return to a definition of barrier quite similar to Huang's (1982). Since they maintain that C does not free its IP complement from barrierhood, IP adjunction and the category/segment distinction seem to be assumed for examples such as (i).

- (i) Mary wonders [_{CP} what_i [_{IP} t'_i [_{IP} John [_{VP} bought t_i]]]]

This appears to be one of the reasons they tacitly maintain the adjunction analysis of Chomsky (1986). Note here that since the *wh*-island effect is not accounted for in terms of barriers, there is no longer any strong reason to exclude adjunction to IP.

²⁹ See Tada (1990, 1993) and Fukui (1993) for detailed discussion on scrambling and the Economy Principle.

³⁰ The example is of course completely out for those who do not readily allow embedded topicalization.

³¹ Note that if the embedded topic is made specific, the *wh*-movement becomes impossible due to the specificity effect. For detailed discussion on extraction out of non-right branch constituents, see Kuno (1973a).

³² If we maintain the definition in (65), this implies that barriers, as opposed to BCs, are defined in terms of segments, not categories. This is so since the IPs in (64a-b) must function as barriers even if IP adjunction is possible.

³³ Daiko Takahashi (p.c.) has pointed out that the trace of *nani* 'what' might be in violation of the ECP in (79). Suppose that traces are checked by the ECP strictly "as they are created," as proposed in Chomsky and Lasnik (1991). Then, the trace of *nani* fails to be licensed since the *wh* is first adjoined to *naze* in A'-position, and, by assumption, antecedent government from an A'-adjoined position is impossible. The following example avoids this complication and hence illustrates the point made in the text more appropriately:

- (i) *John-ga naze [_{CP} Mary-ga nani-o katta to] omotteru no
 -Nom why -Nom what-Acc bought Comp think Q
 'Q John thinks [that Mary bought what] why'

In this example, *nani* can clearly move to an A'-position and license its trace before it adjoins to *naze*. Since *naze* is in A'-position, this will not be a case of improper movement. Further, the trace in the intermediate A'-position must delete due to Full Interpretation. Hence, the trace of *nani* can be properly licensed in this example.

³⁴ Kikuchi (1989) argues convincingly that comparative deletion in Japanese involves empty operator movement, and then shows that the presence and absence of island effects noted with scrambling are observed more clearly with this construction. See also Ishii (1991) for relevant discussion on comparative deletion.

³⁵ See May (1985), Lasnik and Saito (1984, 1992), and Lee (1993) for discussion on the absence of Comp-trace effects at LF.

³⁶ See also Pollock (1989) for discussion on the "articulated" sentential structure.

³⁷ This analysis of the difference between English and Japanese with respect to 'adjunction to subject' is inconsistent with the account for the A-properties of clause-internal scrambling suggested in Saito (1992). I suggested there that an IP-adjoined object NP can acquire the A-properties in LF because it can participate in Spec/head agreement with the verb raised to I. Given this analysis, *naze* should not be able to adjoin to a scrambled object in A-position for the same reason that prohibits adjunction of *why* to a *wh*-subject in English. I tentatively assume here, along the lines of Tada (1990), that an IP- (TP-) adjoined phrase can acquire the A-properties when it falls within the projection of its theta-role assigner. This happens in LF, if V raises to I (T) at this level, as assumed in Saito (1992). (See Park (1991) for supporting arguments for this hypothesis.) I assume further that IP- (AgrP-) adjoined phrases in English, i.e., topics, cannot acquire the A-properties because the Spec of AgrP closes off the projection by Spec/head agreement, as proposed in Fukui and Speas (1986) and Fukui (1986).

³⁸ Noam Chomsky (p.c.) has informed me that "the clause boundedness" of the additional-*wh* effect in English is quite general, and is observed not only with the ECP examples of the kind in (90)-(91) but also with superiority examples like (92). This of course suggests that (90b)/(91b) and (92b) are instances of the same general phenomenon.

Another problem that arises with this approach concerns Japanese examples like (30): we must prevent a lower *wh* from saving *naze* 'why' within an island, while allowing *what/where* to save *why* in (90b)/(91b).

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