

Wh-Questions, Weak Crossover, and Null-Pronouns in Japanese

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0. INTRODUCTION

It is well-known that Japanese does not involve syntactic movement in constructing wh-questions. Wh-words occur where ordinary arguments do (i.e., A-positions). This characteristic is shared with Chinese. (Huang (1982)) Differing from Chinese, however, the scope of a wh-word in Japanese is indicated by a question (Q) morpheme *ka* that occurs at the end of the sentence (in COMP).¹ Without syntactic movement, a wh-word can occur in any argument position, no matter how deeply embedded it is inside a syntactic island. Hence, along with simple questions such as (1a), we obtain sentences such as (1b) and (1c).

- (1) a. Mary-wa dare-ni ai-masita ka.
 -top who-dat meet-polite Q
 'Who did Mary meet?'
- b. Mary-wa [nani-o kaita] hito-ni itta no.
 what-acc wrote person-dat met Q
 '(lit.) What did Mary meet the person who wrote *t*?'
- c. John-wa [Mary-ga nani-o kaku mae-ni] Tokyo -ni
 -nom what-acc write before -to
 itta no.
 went Q
 '(lit.) What did John go to Tokyo before Mary wrote *t*?'

It has often been considered that wh-questions that do not involve

¹ The wh-question morpheme is *ka*, which is also used for yes-no questions. Both wh-questions and yes-no questions end with a rising intonation. In colloquial speech, in stead of (or sometimes in addition to) *ka*, *no* with a rising intonation is often used, if a matrix sentence is a question. Strictly speaking, *no* is not a question morpheme, but a nominalizer. However, in this paper, I will treat *no* just like *ka* and consider that *ka* and *no* occur in COMP.

movement disregard Subjacency and other island conditions which play crucial roles in describing wh-questions that involve syntactic movement.

In recent developments of Government-Binding (GB) theory, a movement rule, Move α , is assumed to be operative not only in syntax but also in Logical Form (LF). This extension of the domain of Move α operation, called Quantifier Raising (QR), provides the theory with a mechanism that assigns scope for quantifier expressions such as *everything*, *someone*, etc. (May (1977), Chomsky (1981), Huang (1982), etc.) Given QR, it is natural to assume that wh-words in Japanese are also subject to QR in LF. Then (1a), for example, is represented as in (2) in LF.²

(2) [_S [_S Mary-wa t_i ai-masita]_{COMP} ka [_{NP} dare(-ni)]]

The case of wh-questions that involve islands, such as (1b) and (1c), is not as straightforward as that of simple questions such as (1a). There have been at least two types of analyses proposed in past literature. One is represented by Huang (1982) where a wh-word alone simply moves to COMP. In this analysis, an LF representation of (1b), for example, is something like (3).

(3) [_S [_S Mary-wa [_{NP} [_S t_j t_i kaita] hito_j]-ni atta]_{COMP} no nani_i-(o)]]

The movement of QR which is indicated by a line in (3) apparently disregards island conditions such as Subjacency, for it is out of a relative clause.

² Not only wh-words but also other quantifiers, such as *daremo* 'everyone', *nanika* 'something', numeral expressions, etc., are subject to QR. (Cf. Section 5) It is not clear exactly where such quantifiers move to. It may be the case that non-wh-quantifiers adjoin to an S node, as has been proposed for English (May 1977), and wh-operators, such as *dare* 'who', *nani* 'what', etc. move to COMP where a Q-morpheme, *ka* or *no*, occurs. Since we are mainly concerned with wh-questions in this paper, most of the examples that are subject to QR involve wh-words. I assume that a wh-word moves to COMP where a Q-morpheme is generated. (Cf. Nishigauchi (1984) for a slightly different analysis. See, fn. 4.)

Throughout this paper, I disregard the difference between NP-*wa* 'topic NP' and NP-*ga* 'nominative NP' and treat them as if they both were matrix constituents. In general, wh-questions are quite awkward without a topic phrase, unless the subject itself is wh-questioned. See Kuno (1973), Hasegawa (1984), for example, for analyses of topic phrases.

The other approach is suggested independently by Choe (1984), Nishigauchi (1984), and Pesetsky (1984), where a wh-word inside an island pied-pipes the whole island to COMP. In effect, the movement itself observes Subjacency. Under this analysis, the LF representation of (1b) is something like (4), which is identical to (2), in terms of the distance of the movement.

(4) [_S [_S Mary-wa t_i atta]_{COMP} no [_{NP} [_S nani-o kaita] hito]-(-ni)]]

In what follows, by examining the interaction of wh-questions, weak crossover (WCO) effects, and null-pronouns in Japanese, I will argue that a pied-piping (PPP) analysis of wh-questions can explain more data than a non-pied-piping (N-PPP) analysis. In Section 1, I will briefly review major arguments for the PPP analysis presented by Choe, Nishigauchi, and Pesetsky. In Section 2 and 3, I will examine WCO effects in Japanese, which are discussed in Saito and Hoji (S&H) (1983), Hoji (to appear), Saito (1985), in light of the PPP and N-PPP analyses. Recently, the WCO phenomena have attracted much attention, and several interesting analyses have been proposed. (e.g., Koopman & Sportiche (1981), Safir (1984), S&H (1983), Higginbotham (1980, 1983), etc.) In this paper, I do not intend to argue for any particular analysis. Instead, I will identify WCO with a configuration rather than with a set of phenomena that falls under one particular analysis. In Section 3, we will consider the examples that appear to meet the WCO configuration but do not exhibit the WCO effects. These examples seem to be problematic for an analysis where an empty category (EC) in A-position is regarded as a pure pronominal (i.e., *pro* [+ pronominal, - anaphor]). In section 4, I will suggest that the problem raised in Section 3 can be solved if the PPP analysis is assumed in conjunction with the assumption that an EC in an A-position is analyzed as a variable bound by an empty operator in COMP, which I propose in Hasegawa (1984) on independent grounds. Hence, the arguments for the PPP analysis presented in this paper may also serve as arguments for the proposal in Hasegawa (1984).

Before starting the main discussion, a few remarks on the syntactic structure of Japanese are in order. Throughout this paper, I would like to assume that Japanese is basically a left-branching language, where each branching is binary, and that a VP node (V^{\max}) exists in Japanese. (See, Kayne (1981), Huang (1982), Whitman (1982), Hoji (1982, to appear), Kuroda (1983), Saito (1983, 1985), and references cited there.)

This means that Japanese and English are basically identical in terms of government relations, and they differ from each other only in terms of the position of head; Japanese being head-final and English head-initial. Furthermore, following Saito (1983, 1985), I assume that the scrambled (or free) surface word-order results from the application of Move α in syntax, which adjoins a constituent to a maximal node (VP and S, in particular).

1. WH-QUESTIONS AND SUBJACENCY

Choe, Nishigauchi, and Pesetsky, though details of their analyses differ from one another, all claim that QR (in particular, the movement of wh-words in LF) observes Subjacency in Japanese. They note the existence of peculiar restrictions placed on the short answer formation for a wh-question that involves an island. A wh-question, in general, can be answered in two ways, a long answer (5b) or a short answer (5c), as indicated below.

- (5) a. John-wa nani-o tabeta no
 -top what-acc ate Q
 'What did John eat?'
 b. Sushi-o tabeta. '(He) ate sushi.'
 c. Sushi da. '(It) was sushi.'

A short answer (5c) simply specifies the value of a wh-word given in a question, which is followed by a copula, *da* or *desu*. A long answer not only fills in the value of the wh-word but also repeats the verb. (Cf. Kuno (1978))

When a wh-word occurs in an island, a short answer that minimally supplies the value of a wh-word is allowed only when it is uttered in a rather colloquial situation, and/or when the choice of the value is restricted to a limited set. (Cf. Choe, Nishigauchi, Pesetsky) A preferred answer is either a long answer or a short answer that repeats the entire island. This is illustrated in (6). (6a), an honorific version (hence a less colloquial version) of (1b), is answered either by (6b) or (6c), but not by (6d).

- (6) a. Sensei-wa nani-o kaita hito-ni
 teacher-top what-obj wrote person-dat
 o-ai-ni-natta no desu-ka.
 meet(honorific) Q
 '(lit.) What did the teacher meet the person who wrote *t*?'
 b. Sono hon-o kaita hito-ni o-ai-ni-natta no desu.
 that book
 '(He) met the person who wrote that book.'
 c. Sono hon-o kaita hito desu.
 '(It) was the person who wrote that book.'
 d. ?*Sono hon desu.
 '(It) was that book.'

As Nishigauchi correctly characterizes, questions in which a wh-word occurs inside an island, such as (1b), (1c), and (6a) are not asking the value of a wh-word *per se*; but rather, the wh-question (1b) is asking the identity of the person who *Mary* met by means of what he wrote. Likewise, (6a) is asking the identity of the person who *the teacher* met by means of what he wrote, and (1c), the exact time reference of *John's* going to Japan with respect to what *Mary* wrote. Hence, it seems most natural to provide an answer that supplies the identity of the person or the time, rather than an answer that simply fills in missing information in the question. The strangeness of (6d) lies exactly in this "intuition"—(6d) is odd, because it sounds as if *the teacher* met "that book".

Choe, Nishigauchi, and Pesetsky argue that this peculiar condition on the short answer formation can be captured if it is assumed that a short answer corresponds to what actually moves into the COMP of its question-counterpart. This means that the entire island, *nani-o kaita hito(-ni)* 'the person who wrote what' moves to COMP in (6a), in order for (6c) to be a legitimate short answer. And crucially, *nani* alone cannot move to COMP, which can be ensured if Subjacency is at work.

Questioning an item inside an adverbial adjunct (AD) observes the same restriction, as expected; a much preferred short answer for (1c) is (7a), rather than (7b).³

³ A short answer that is made up of a constituent in an adverbial adjunct seems more acceptable than the one out of a relative clause (such as (1b) and (6a)). Nonetheless, there is a clear contrast between (7a) and (7b), which can even become stronger, if a question-answer pair involves honorific expressions, which makes the situation less colloquial.

- (7) a. Ryoosin-e-no tegami-o kaku mae desu.
 parents-to-gen letter-acc wrote before copula
 '(It) was before (she) wrote a letter to her parents.'
 b. ??Ryoosin-e-no tegami desu.
 '(It) was a letter to her parents.'

Exactly how the pied-piping convention works is non-trivial and may require careful examination. However, in this paper, I will simply follow the basic mechanism proposed by Nishigauchi.⁴ He claims that pied-piping is basically restricted to languages that have a prenominal SPEC(ifier) position. He assumes that the feature [$\pm wh$] is given not only to the head of a category but also to SPEC. Following the general practice, the feature of the head percolates up to its maximal projection. Furthermore, the feature of SPEC, just in case it is not specified in the feature matrix of the head, may also percolate up to the maximal projection. (Selkirk (1982)) Since a COMP with a question morpheme, which I consider as spell-out of the [$+ wh$] feature, must be filled with a [$+ wh$] item, the maximal projection that is marked [$+ wh$] must move to such a COMP in LF.

Under this analysis, the S-structure representation of the example (8a) exhibits the feature percolation and the application of QR in LF shown in (9).

(8) a. S-Structure:

John-wa [Mary_m-ga [[e_m dare-ni t_k ageru]hon_k]-o
 -top -nom who-dat give book-obj

kau mae-ni Tokyo-e itta no.

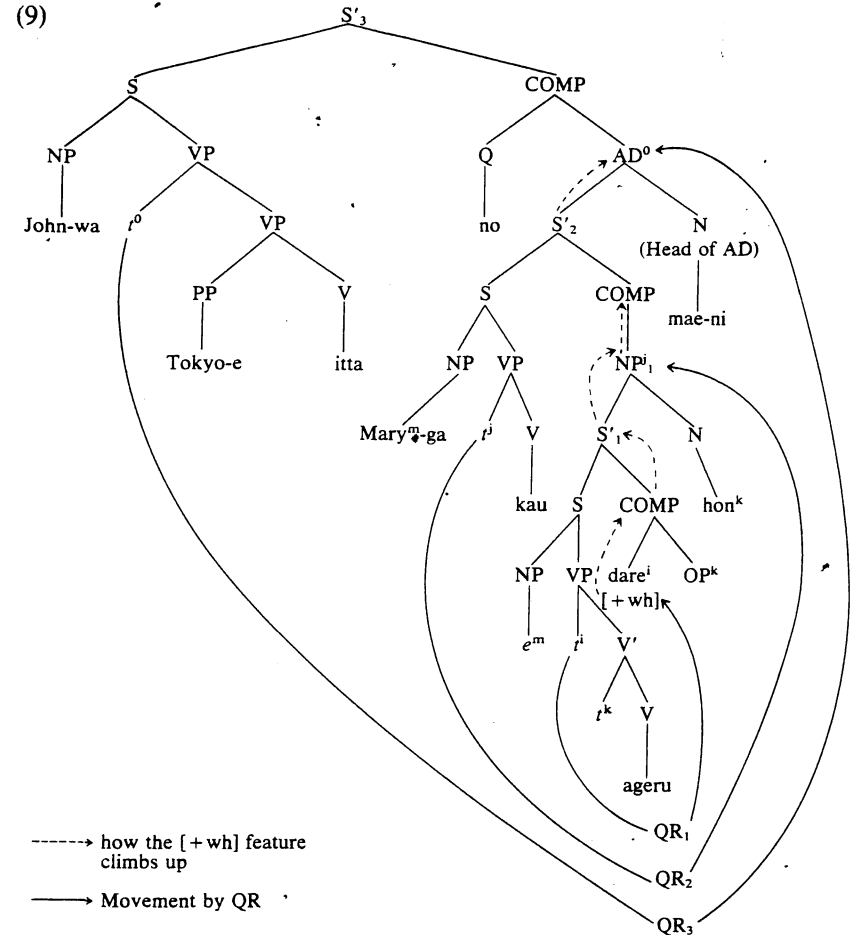
buy before -to went Q

'(lit.) John went to Tokyo before Mary bought the book that she was going to give to whom?'

b. LF:

[S₃[S John-wa t⁰ Tokyo-e itta][COMP no [AD₀ [S₂ Mary^m-ga tⁱ kau] [COMP[NP₁[S₁[S e^m tⁱ t^k ageru][dareⁱ]]hon^k]-(-o)] mae-ni]]]

⁴ Nishigauchi (1984) adjoins a wh-word to an S' node and he requires that it be c-commanded by a COMP with the [$+ wh$] feature (i.e., with a Q-morpheme). As shown in (8), I would like to maintain that QR adjoins a wh-word to COMP. As Nishigauchi notes, these two approaches are more or less equivalent.



In (9), in order for the [$+ wh$] feature given to the original wh-word, *dare* 'who', to percolate up to the highest node AD, the wh-word must first move to the closest COMP, which is the head of S'₁. Then, this S'₁ serves as SPEC of NP₁, whose head is unspecified with respect to the feature [$\pm wh$]; thus, the [$+ wh$] feature of S'₁ percolates to the node NP₁. Being specified as [$+ wh$], NP₁ is now subject to QR, whose movement is expressed by the line QR₂. Once NP₁ occupies the COMP of S'₂, its [$+ wh$] feature percolates up to S'₂, which serves as SPEC of AD. The head of AD is not specified with respect to [$\pm wh$]; there-

fore, the [+wh] feature of S'_2 percolates up to AD. Here again, AD, being [+wh], moves to the COMP of the top most S' , namely S'_3 , by QR. The COMP of S'_3 is occupied with a Q-morpheme, which satisfies the well-formedness condition on where a [+wh] item should end up in LF. Though there is no doubt that this percolation mechanism must be carefully reviewed; I believe that what the system means to capture is relatively clear.

Now let us turn our attention to WCO effects in Japanese and see how this PPP analysis works in describing this phenomenon.

2. WEAK CROSSOVER EFFECTS IN JAPANESE

Typical WCO effects can be illustrated with the following English examples:

- (10) a. *Who_i does his_i mother love t_i ?
 b. *His_i mother loves everyone_i.
 b'. [_S everyone_i [_S his_i mother loves t_i]]

In (10a) and (10b'), which is the LF representation of (10b) after the application of QR, an operator, i.e., *who* in (10a) and *everyone* in (10b'), binds its trace t , and a pronoun *his*. Typical WCO effects are found exactly in this configuration; that is, as illustrated in (11), a sentence is unacceptable if an operator binds two items, neither of which c-commands the other. Note that the order of the relevant items is irrelevant here as long as the same c-command relations are observed among an operator, a pronoun, and the trace of the operator.

- (11) [Operator_i [. . . pronoun_i . . . t_i . . .]]
 where neither the pronoun nor the variable (=trace of the operator) c-commands the other.

It is S&H who first seriously examine the WCO phenomenon in Japanese. Their examples involve *zibun* 'self'.⁵ The following examples are taken from S&H.

⁵ Japanese lexical pronouns cannot be construed as bound variables, as discussed in S&H.

- (12) a. [_S[_{NP} Hanako-ga zibun_i-o kiratteiru koto]-ga Zirō_i-o
 -nom self-acc dislike fact-nom -acc
 yuutu-ni siteiru]].
 distressed make
 'The fact that Hanako dislikes him_i has depressed Jiro_i.'
 b. * [_S[_{NP} Hanako-ga zibun_i-o kiratteiru koto]-ga dare_i-o yuutu-ni
 siteiru]] no?
 who
 '(lit.) Who_i has the fact that Hanako dislikes him_i depressed?'

Assuming that the quantifier *dare* 'who' in (12b) is subject to QR in LF, (12b) results in the configuration (13), which is basically the same as (11), abstracting away from the order of the relevant items and the difference between pronouns and *zibun*.

- (13) [[[. . . zibun_i . . .] . . . t_i . . .] [_{COMP} Operator_i]]

At this point, we are not concerned with exactly how these sentences are ruled out. (See fn. 9). What is to be kept in mind here is the fact that Japanese does exhibit WCO effects as long as the configuration (13) results after the application of LF-movement, i.e., QR.⁶

In addition to the WCO cases that involve *zibun*, Hoji (to appear) and Saito (1985) argue that null-pronouns also exhibit the same WCO effects. Observe the following sentences, where e stands for a null-pronoun.⁷

- (14) a. [_{NP}[_S t_i Hitome e_j mita] hito_i]-ga John_j-o sukininata.
 one glance saw person-nom -acc fell-in-love
 'the person who took a glance at (him_j) fell in love with John_j.'
 b. * [_{NP}[_S t_i Hitome e_j mita] hito_i]-ga dare_j-o sukininata no.
 who Q
 '(lit.) Who_j is the person who took a glance at (him_j) fell in love with t_j ?'

⁶ S&H argue that a scrambling operation, an instance of Move α , also triggers WCO effects.

⁷ Hoji (to appear) and Saito (1985) consider that ECs in A-position in Japanese are *pro* [+pronominal, -anaphor]. Chomsky (1982), on the other hand, claims that the distribution of *pro* is limited to the languages that exhibit a 'rich' agreement system, such as Romance languages. In Hasegawa (1984), I maintain Chomsky's position and analyze the ECs of the kind shown in (14) and (15) as variables bound by empty operators that are PRO [+pronominal, +anaphor]. We will come back to this topic in Sections 4 and 5. For the time being, we simply assume that the e 's in (14) and (15) (and other examples to follow) are some sort of pronominal. (Cf. Huang (1982, 1984))

- b. *John-wa [e_i yomitagatteiru hito]-ni [dare-ga kaita hon]_i-o
 okutta no. who
 '(lit.) John sent the book that who wrote to the person who
 wanted to read (it).'

Since the contrast between the (a)'s and the (b)'s are similar to what we have seen in Section 2, we may want to attribute the ungrammaticality of the (b) examples to WCO. Then, we expect the LF representations of the (b) examples meet the WCO configuration (16b). As it can easily be seen, it is not the case, if a question word alone moves to the COMP of the matrix. What we obtain is something like (19).

- (19) [[... [... e_i ...] ... [... t_j ...]_i ...]_{COMP} OP_j]]

In (19), the OP(erator) binds only one variable, t_j ; hence, it does not seem to fall under WCO. Choe and Pesetsky, taking the ungrammaticality of the sentences of this type as evidence, argue for the PPP analysis of wh-questions. The LF representations of the (b) examples of (17) and (18) do meet the WCO configuration (16b) and can be ruled out on a par with other WCO cases, if a wh-word pied-pipes the entire island; *dare-ga kaita hon* 'the book that who wrote' in (17b) and (18b). (17b), for example, is represented as (20) in LF.

- (20) [_S[_S John-wa [_{AD} Mary-ga e_i kau mae-ni] t_i yonda]
 [_{COMP} no [[[t_j kaita][dare_j(-ga)]] hon]_i]]

Thus, the PPP analysis seems to be favored over a N-PPP analysis.

We have so far identified the WCO phenomena with a particular type of configuration (16b), being somewhat neutral to various proposals for accounting for WCO. (See fn. 9) Since this configuration represents an unmarked case of WCO, it would be ruled out, no matter which analysis we may adopt.

A N-PPP analysis, of course, may be able to stand, if it can be argued that the configuration (19) must also be subsumed under WCO. For example, if the following conditions are to be responsible for WCO, the typical case (16b) as well as (19) can be ruled out.¹⁰

¹⁰ The condition (21b) is the same as what S&H propose, i.e., (iv) in fn. 9 above. The notion 'dependent' has been introduced in the literature; e.g. Evans (1980), Higginbotham (1983). Roughly speaking, an item is dependent on some element if the former receives its interpretation via the latter. Hence, the phrase, *the book that John wrote*, is dependent on *John*; likewise, *dare-ga kaita hon* 'the book that who wrote' is dependent on the wh-word *dare* 'who.'

- (21) a. A variable or an NP that is dependent on an Operator cannot be the antecedent of a pronoun and an anaphor that it does not c-command.
 b. A pronoun cannot have a quantified NP in A'-position as its direct antecedent.

A N-PPP analysis may even be preferred, if we try to account for the following examples on the same grounds.¹¹

- (22) a. ?Mary-wa [konsaato-de e_i mita ato][John_i-no rekoodo]-o
 -top concert -at saw after -gen record-obj
 kau ki-ni-natta.
 buy felt-inclined
 'Mary felt like buying John's record after she saw (him) at the concert.'
 b. *Mary-wa [konsaato-de e_i mita ato][dare_i-no rekoodo]-o
 kau ki-ni-natta no. who
 '(lit.) Mary felt like buying whose record after she saw (him) at the concert.'

The examples in (22) differ from those in (17) and (18) in that the null-pronoun of the former refers to a part of a matrix constituent, which may be a quantifier, whereas that of the latter refers to a matrix constituent which may include a quantifier. In LF, (22b) is represented as (23) under the PPP analysis, and as (24) under a N-PPP analysis.

- (23) [_S[_S ... [... e_i ...] ... t_j ...]_{COMP}[... [OP_i]_j]]

- (24) [_S[_S ... [... e_i ...] ... [NP ... t_i ...] ...]_{COMP} OP_i]]

¹¹ It is not easy to construct examples of the type (22). This may be due to the conditions on coreference involving null-pronouns. As indicated by a question mark, (22a) is marginal and it becomes even worse, if an antecedent is embedded more deeply, as shown in (ia).

- (i) a. ??Mary-wa [konsaato-de e_i mita toki][John_i-ga utatta kyoku]-ga sukini-natta.
 -top concert-at saw when -nom sang songs-nom like-became
 'Mary came to like the songs that John sang when she saw (him) at the concert.'
 b. *Mary-wa [konsaato-de e_i mita toki][dare_i-ga utatta kyoku]-ga
 sukini natta no. who
 '(lit.) Mary came to like the songs that who sang when she saw (him) at the concert?'

The point in (i) as well as in (22) is that there is a clear contrast between the (a) examples and the (b) examples. See Hasegawa (1984) for discussion on the interpretation of null-pronouns.

Obviously, (23) does not meet the WCO configuration, because there is no single operator that binds two variables. On the other hand, (24) represents a typical WCO configuration and is rather natural to be ruled out along with other WCO cases. Hence, at this point, it is not quite clear whether the WCO phenomena work for or against the PPP analysis of wh-questions in Japanese; examples in (17) and (18) work for it, while those in (22) go against it. Before solving this dilemma, I would like to consider yet another type of example.

Along with the original WCO examples, (14) and (15), we can construct the following examples by reversing the S-structure positions of a null-pronoun and an NP coreferential with it.

- (25) a. [t_j Sono ronbun_i-o kaita] hito_j-ga e_i syuppan si-tagatteiru.
 that paper-acc wrote person-nom publish-want
 'The person who wrote that paper wants to publish (it).'
 b. ?[t_j Nani_i-o kaita] hito_j-ga e_i shuppan si-tagatteiru no.
 what Q
 '(lit.) The person who wrote what wants to publish (it)?'
- (26) a. John-wa [Mary-ga sono hon_i-o yomu mae-ni] e_i
 -top -nom that book-obj read before
 sutetesimatta.
 discard-have
 'Before Mary read that book, John had thrown (it) away.'
 b. ?John-wa [Mary-ga nani_i-o yomu mae-ni] e_i sutetesimatta no.
 what Q
 '(lit.) Before Mary read what, John had thrown (it) away?'

What is interesting in these examples is that they do not exhibit WCO effects. Note that the S-structure representations of the (b) examples in (25) and (26) are the same as those in (14) and (15) in terms of the c-command relation between a null pronoun and a quantifier; i.e., the configuration (16a). This means that if a wh-word alone moves to the matrix COMP, we obtain a WCO configuration (16b) and the (b) examples are wrongly predicted to be ungrammatical. The acceptable status of (25b) and (26b) strongly suggests that they be represented differently from the WCO cases, (14b) and (15b). Thus, a N-PPP analysis does not provide a straightforward explanation for the observed difference in these two sets of examples.

Now, let us see what the PPP analysis can say about (25) and (26). Note that wh-words in these examples are in a syntactic island; in a relative clause in (25b) and in an adjunct in (26b). Under the PPP an-

alysis, these examples are represented as in (27), which obviously is different from the WCO configuration (16b) and is expected to be ruled in.

- (27) [. . . t_i . . . e_j . . .]_{COMP} Q [. . . t_j . . . [OP_j] . . .]_i

The examples in (25) and (26) seem to strongly indicate that the PPP analysis clearly has an advantage over a N-PPP analysis.

As discussed earlier, a problematic case to the PPP analysis is the representation (23). A possible solution has already been suggested in (21b) (Cf. fn. 9); i.e., a pronoun cannot have a quantifier NP as its direct antecedent. This condition has been motivated independently of WCO phenomena. (Cf. Saito (1985, Ch. 2))¹² Then (23) can be correctly ruled out within the PPP analysis. Hence, I would like to assume in the following sections that the PPP analysis proposed independently by Choe, Nishigauchi, and Pesetsky is basically correct. As has been observed, it can provide a unified explanation for all the WCO cases, as long as the general and independently motivated condition (21b) is adopted in grammar.

The adopted condition (21b), however, immediately raises another question: Why doesn't (21b) apply to (27) (= (25b) and (26b)) in which a null pronoun e_j seems to take a quantifier, OP_j, as its direct antecedent?¹³ In order to answer this question, we have to investigate the nature of null-pronouns.

4. NULL-PRONOUNS AND PIED-PIPING

In the preceding discussion, we have considered an EC in A-position as a pronoun, i.e., *pro* [+ pronominal, - anaphor]. As noted in fn. 7,

¹² For example, this condition can explain why resumptive pronouns are allowed in (non-restrictive) relative clauses but not in questions in English. (Cf. Pesetsky (1982))

- (i) a. This book, which John regretted that Mary had returned *it* to the library.
 b. ?*What book did John regret that Mary had returned *it* to the library?

The difference between (ia) and (ib) is whether there is a lexical head which can serve as an antecedent of a (resumptive) pronoun. In (ia), *this book* (not *which*) can be the direct antecedent of *it*, by which this example can escape the condition (21b). In (ib), on the other hand, such an option is not available and the resumptive pronoun *it* is forced to take *what book* as its direct antecedent, resulting in a violation of (21b).

¹³ It may be the case that e_j takes the trace (t_j) of OP_j in COMP as its direct antecedent. Then, (21b) would not apply here. However, if we adopt S&H's account for WCO, a trace cannot be an antecedent of a pronominal that it does not c-command (see fn. 9, (iii)), thus, I consider that this option is unavailable.

the distribution of such pronominals has been claimed to be restricted only to languages that exhibit 'rich' agreement systems. (Chomsky (1982), Huang (1984)) In fact, in Hasegawa (1984), I maintain that Japanese, a language without a rich agreement system, does not exhibit *pro* and argue that an EC in A-position is created by the syntactic movement of PRO to A'-position. In other words, an EC in A-position is a variable bound by PRO in A'-position (i.e., empty Operator). According to this analysis, the sentences (15a) and (26a), for example, are represented as (28a) and (28b), respectively, at S-structure.

- (28) a. [John-ga [_{AD}[_S[_S Mary-ga t_i yomu][_{COMP} PRO_i]] mae-ni]
 -nom -nom read before
 sono hon_i-o suteta.]
 that book-acc discarded
 'John threw away the book before Mary read (it)'
 b. [_S[_S John-ga [_{AD} Mary-ga sono hon_i-o yomu mae-ni] t_i]
 -nom -nom that book-acc read before
 sutete-simatta][_{COMP} PRO_i]]
 discarded-have
 'Before Mary read that book, John had thrown (it) away.'

In (28), PRO occurs in an A-position (where t_i is in (28)) at D-structure. Before S-structure, this PRO moves to the COMP, the adjunct COMP in (28a) and the matrix COMP in (28b). PRO is subject to construal rules, such as the Control Rule. Here, we are not concerned with exactly how the Control Rule operates and the reader is referred to Manzini (1983) and Hasegawa (1984). A crucial condition that is relevant here is that PRO, or a pronominal in general, cannot pick out its reference from an item that it c-commands. (Cf. S&H, Evans (1980), Higginbotham (1980)) This means that although PRO in (28a) is allowed to refer to *sono hon* 'that book', because the former does not c-command the latter, PRO in (28b) that is in the matrix COMP cannot pick out its reference from *sono hon* in the adjunct.

The solution suggested in Hasegawa (1984) is that PRO picks out its reference not from *sono hon* in the adjunct but from an empty topic phrase, which happens to be the same as *sono hon*. Following Huang (1982, 1984), I assume that an empty topic is allowed in Japanese (also in Chinese and Korean). This predicts that if PRO refers to an indefinite and non-specific NP; a kind of NP that does not normally occur as Topic, it would result in an ungrammatical sentence, because PRO

cannot refer to Topic nor to an NP that it c-commands. This prediction is borne out by the following examples.

- (29) a. *[[John-wa [_{AD} Mary-ga hon_i-o yomu mae-ni] yoku t_i]
 -top -nom book-acc read before often
 sutete-simau][_{COMP} PRO_i]]
 discard-perfect
 'Before Mary has read a book, John has often thrown (one)
 away.'
 b. *[[John-wa [_{AD} usagi_i-ga hatake-o arasita kara] t_i]
 -top rabbit-nom field-acc damage because
 kirai-da][_{COMP} PRO_i]]
 hate
 '(lit.) Because rabbits did harm to the field, John hates (them).'

What is to be noted here is that wh-words are "indefinite" and "non-specific" by definition. They are never allowed to occur as Topic, as shown in the following examples.

- (30) a. *Nani-wa yonda no. a'. Nani-o yonda no.
 what-topic read Q -acc
 'What did (you) read?'
 b. *Dare-wa kuru no. b'. Dare-ga kuru no.
 who-topic come Q -nom
 'Who will come?'

Now, recall the examples (25b) and (26b), which are repeated as (31a) and (31b), respectively.

- (31) a. ?[[[_{NP} Nani_i-o kaita hito]-ga t_i syuppan si-tagatteiru]
 what-acc wrote person-nom publish-want
 [_{COMP} no PRO_i]]
 Q
 '(lit.) The person who wrote what wants to publish (it)?'
 b. ?[[John-wa [Mary-ga nani_i-o yomu mae-ni] t_i]
 -top -nom what-acc read before
 sutete-simatta] [_{COMP} no PRO_i]]
 discard-have
 '(lit.) Before Mary read what, John had thrown (it) away?'

These examples are quite acceptable, if not completely grammatical. Note that PRO in (31) cannot refer to Topic, because Topic cannot be filled with a *wh*-word as shown in (30). Nor can it refer to a *wh*-word directly in (31), because the former *c*-commands the latter. The grammaticality of (31) seems to suggest that PRO there has some other way to find an antecedent. That is, PRO in [+*wh*] COMP is different from PRO in [-*wh*] COMP. This speculation is supported by the fact that the examples (29) become grammatical if the 'indefinite', 'non-specific', and [-*wh*] words are replaced with *wh*-words. Compare (29) with (32).

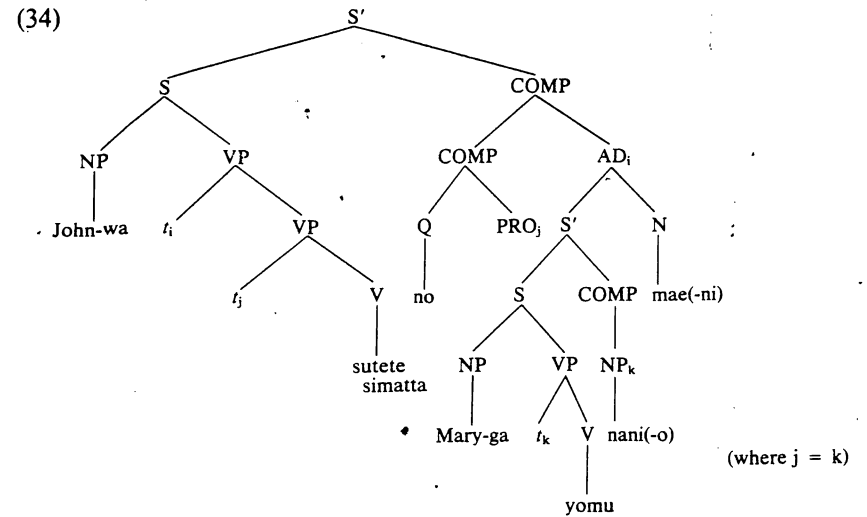
- (32) a. [[John-wa [_{AD} Mary-ga nani_i-o yomu mae-ni] yoku *t_i*
 -top -nom what-acc read before often
 sutete-simau][_{COMP} no PRO_i]]
 discârd-perfect Q
 '(lit.) Before Mary has read what, John has often thrown (it)
 away?'
- b. [[John-wa [_{AD} nani_i-ga hatake-o arasita kara] *t_i*
 -top what-nom field-acc damage because
 kirai-na][_{COMP} no PRO_i]]
 hate Q
 '(lit.) Because what did harm to the field, John hates (it).'

As in the case of (31) and (29), PRO in (32) cannot refer to Topic which cannot be 'indefinite' and 'non-specific'. Furthermore, it cannot refer to an NP that it *c*-commands, just as in (29). Hence, the discrepancy in the grammaticality of (29) and (32) is a mystery, unless we assume that there is an independent way to assign reference to PRO in questions.

Here, I would like to propose that PRO can corefer to an NP in LF, if PRO and the NP are both under the same COMP. Under this proposal, the examples in (31) and (32) are represented as something like (33) not as (27).

- (33) [_{S'} [_S ... *t_i* ... *t_j* ...] [_{COMP} Q [PRO_j [_{AD_i} ...
 t_k ... [OP_k ...]]]]]
 (where, *j* = *k*)

(34) will clarify the point, where (31b) is taken as a representative.



Here, I would like to maintain that PRO finds its antecedent through a Q-morpheme, rather than directly from a question word in COMP, *nani* 'what' in (34). Recall that the problem with the representation (27) is that it violates the general condition (21b) that a pronominal, which may be PRO, cannot take a quantifier as its direct antecedent. I assume that the same condition is at work here. (33) and (34), on the other hand, can escape the condition (21b), if the coreference mechanism involves the following two steps: (i) as a part of the mechanism which ensures that a [+*wh*] COMP is filled with a [+*wh*] item, a Q-morpheme is coindexed with any maximal projection that is marked with [+*wh*]. (The reader is referred to the discussion in Section 1 on how the feature [+*wh*] percolates up to the top node.); (ii) PRO in a [+*wh*] COMP picks out the index of the Q-morpheme of the same COMP. The proposed system needs careful review; however, there is some evidence that seems to indicate that this or a similar mechanism is needed in the grammar; which will be discussed in the next section.

5. SUMMARY AND CONSEQUENCES

I have shown that the PPP analysis of *wh*-questions in Japanese can explain various data that involve the WCO phenomenon. A N-PPP analysis, on the other hand, does not seem able to explain why we observe a difference in grammaticality between the two cases: (A) Sen-

tences that involve a wh-word in a matrix clause and its coreferring EC in a syntactic island. This situation results in ungrammatical sentences as being exemplified by (14b) and (15b); (B) Sentences in which a wh-word is in an island and a coreferring EC in a matrix clause. This is the case of (25b) and (26b), and they are grammatical. This difference does not raise a problem to the PPP analysis if we assume that an EC in A-position is a trace of PRO which has moved to COMP. I proposed a mechanism by which PRO can receive an index from a Q-morpheme which is coindexed with a [+wh] item. There are at least two pieces of evidence that supports this line of research.

First, we observe a difference between wh-questions and other quantifiers such as *dare-mo* 'everyone', *nani-ka* 'something', etc. As discussed in S&H and Hoji (to appear), WCO effects are usually triggered not only by wh-words but also by ordinary quantifiers. Hence, we obtain the following sentences along with (12b), (14b), and (15b).

- (35) a. *[_S[_{NP} Hanako-ga zibun_i-o kiratteiru koto]-ga
 -nom self-acc dislike fact-nom
 daremo_i-o / dareka_i-o yuutu-ni siteiru.]]
 everyone-acc someone-acc depressed make
 'The fact that Hanako dislikes self_i has depressed everyone_i/
 someone_i.'
- b. *[_{NP} [_S *t_i* Hitome *e_j* mita] hito_i]-ga daremo_j-o
 one glance saw person-nom everyone-acc
 sukininatta.
 fell-in-love
 'The person who took a glance at (him) fell in love with
 everyone.'
- c. *John-wa [_{AD} Mary-ga *e_i* yomu mae-ni] nanika_i-o
 -top -nom read before something-acc
 suteta.
 discarded
 'John threw away something before Mary read (it).'

Based on the ungrammaticality in these examples as well as in the WCO cases that involve wh-words, we may conclude that wh-words and other quantifiers behave in the same way and that they are to be treated in the same way. However, this parallel behavior breaks in the situation (B) above, where a quantifier starts out in a syntactic island and a coreferring EC in a matrix clause. Compare the following (36) and (37) with (31) and (32), respectively.

- (36) a. *[_{NP} Nanika_i-o kaita hito]-ga *e_i* syuppan si-tagatteiru.
 something-acc wrote person-nom publish want
 'The person who wrote something wants to publish (it).'
- b. *John-wa [Mary-ga nanika_i-o yomu mae-ni] *e_i*
 -top -nom something-acc read before
 sutete-simatta.
 discard-have
 'Before Mary read something, John had thrown (it) away.'
- (37) a. *John-wa [Mary-ga nanika_i-o yomu mae-ni] yoku *e_i* sutete-simau.
 'Before Mary has read something, John has often thrown (it) away.'
- b. *John-wa [nanika_i-ga hatake-o arasita kara] *e_i* kiraida.
 -top something-nom field-acc damage because hate
 'Because something did harm to the field, John hates (it).'

The examples in (36) and (37) are ungrammatical, whereas those in (31) and (32) are grammatical. This suggests that wh-questions and non-wh-quantifiers be treated separately. The obvious difference between these two types of quantifiers is that wh-words always involve Q-morphemes but non-wh-quantifiers do not. Therefore, it seems quite natural to attribute the difference in grammaticality to this particular difference. In our system, without a Q-morpheme in COMP, PRO takes a quantifier NP as its direct antecedent, which violates the general condition (21b). Or PRO is forced to refer to a trace of a quantifier which is c-commanded by PRO; a violation of a general condition for pronominal coreference. Hence, the sentences of the type (36) and (37) always result in ungrammatical sentences as long as they involve non-wh-quantifiers.

Another piece of evidence that indicates that a Q-morpheme has something to do with the interpretation of PRO is relevant to the availability of a short answer that simply fills in the value of a wh-word to the questions of the type (A); (31) and (32). In Section 1, we have discussed that a short answer must repeat the entire island in addition to providing the value of a wh-word. This is one of the major motivations for the PPP analysis. According to this generalization, the answers to the questions in (31) and (32) must repeat the entire islands in which wh-words occur. However, preferred answers are those that simply provide the values of the wh-words, rather than repeating the islands. Thus, the (a) answers are better than the (b)'s to the questions (31a) and (32a), for example.

(38) (answers to the question (31a))

- a. Kono ronbun desu.
 this paper copula '(It) was this paper.'
 b. *_{[NP} Kono ronbun-o kaita hito] desu.
 -acc wrote person copula
 '(It) was the person who wrote this paper.'

(39) (answers to the question (32a))

- a. Sinbun desu.
 newspaper copula '(It) was the newspaper.'
 b. *_{[AD} Mary-ga sinbun-o yomu mae] desu.
 -nom newspaper-acc read before copula
 '(It) was before Mary read the newspaper.'

To be more precise, what is to be supplied as a short answer to this type of question is what PRO (or an empty category in a matrix) actually stands for. In other words, though a wh-word is inside an island, its value can (and must) be identified in terms of the same value in a matrix clause, as if the wh-word had occurred in a matrix clause. I would like to maintain that this sort of switch in identifying what is questioned takes place in COMP. As I proposed in Section 4, a Q-morpheme takes an index of a maximal projection that is marked [+wh]. Then, PRO picks out the index of the Q-morpheme as long as it fits in the context. (The index must be that of an NP, since PRO is an NP.) A short answer can be formed when the index of a Q-morpheme represents an independent constituent in COMP. Then, if there is only one item in COMP, it constitutes a short answer. This is the case discussed in conjunction with (5), (6), and (7). If there is more than one item in COMP; however, the one whose index is the same as a Q-morpheme constitutes a short answer. In the case of (34), the Q-morpheme *no* may pick out the index of the original wh-word, NP_k, S', or the entire adjunct (AD), among which only the NP_k is qualified to be the antecedent of PRO. S' cannot be chosen because it is dominated by another node (AD) and does not represent an independent constituent in COMP. The adjunct is a possible choice; however, it cannot provide a reference for PRO. A hidden assumption here is that PRO must be interpreted in some way. In the case of the type of sentence in question, the only possible way for PRO to be interpreted is to be coindexed with a Q-morpheme, as discussed before. Thus, only when the Q-morpheme picks out the index of an NP, NP_k in the case of (34), does a legitimate short answer result, since it represents PRO, an independent constituent in COMP. This explains the data in (38) and (39), which at first glance seem to go against the

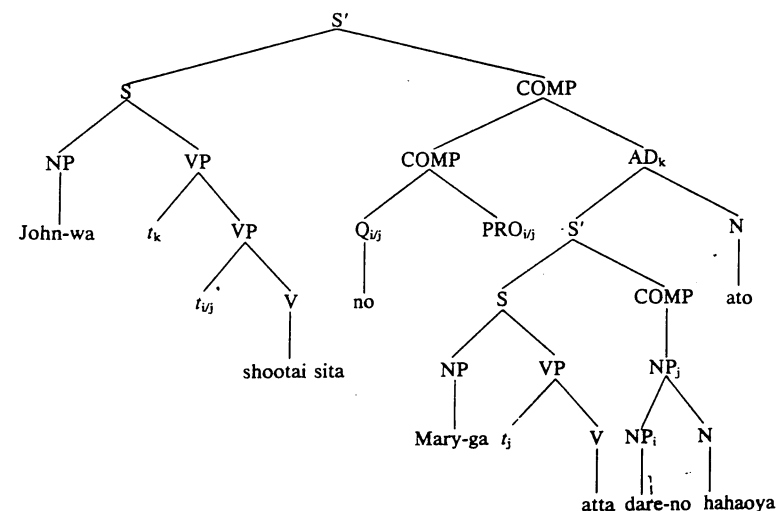
generalization on the short answer formation. The system outlined above, on the contrary, is compatible with these data as well as those in Section 1.

Moreover, this system predicts that if there is more than one constituent in COMP and all qualify to be an antecedent of PRO, there may be more than one way to form a short answer, depending on the index of which antecedent a Q-morpheme picks out. This prediction is in fact borne out.

- (40) a. John-wa [_{AD} Mary-ga [_{dare_i-no} hahaoya]_j-ni atta ato] _{e_{ij}}
 -top -nom who-gen mother-dat met after
 syootai sita no.
 invited Q
 '(lit.) After Mary met [whose_i mother]_j, John invited him_i/
 her_j.'
 b. Bill_i desu. '(It) was Bill.'
 c. [Bill-no hahaoya]_j desu. '(It) was Bill's mother.'

(40a) is represented as (41) at LF.

(41)



In the COMP of (41), there are four maximal projections with the [+wh] feature, NP_i, NP_j, S', and AD, with which the Q-morpheme is co-indexed. The latter two are excluded, because they do not provide proper interpretation for PRO. The first two, being NP, do qualify to

be an (indirect) antecedent of PRO and in fact this sentence is ambiguous between these two readings. (The reading, NP_i, is obviously stronger and this may have something to do with the A/A condition.)

The analysis of wh-questions in Japanese proposed in this paper suggests that wh-words and other quantifiers be analyzed differently, though they both are subject to QR. It may be the case that they behave differently because where they move to is different; as briefly touched upon in fn. 2, wh-words move to COMP, while other quantifiers may be adjoined to an S node; or else, the difference between the two is due to the existence/non-existence of a Q-morpheme. I have assumed in this paper that a Q-morpheme plays an important role not only in distinguishing these two types of quantifiers but also in providing explanations for how short answers are formed and for how PRO picks out its reference. The proposed analysis for the interactions among wh-questions, WCO effects, and null-pronouns must be worked out in further detail; however, I believe that the basic line of research is on the right track.

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