

# Japanese LF: Subjacency vs. ECP

Taisuke Nishigauchi

## 1. Introduction

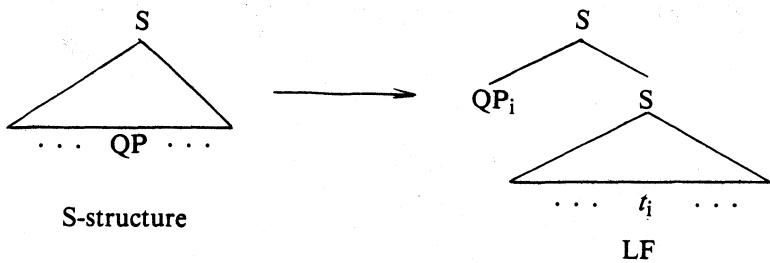
Japanese is one of the languages where so-called WH-phrases, such as *what* (*nani*), *who* (*dare*) etc., appear in the argument positions, viz. those positions in the sentence where typically, noun phrases can appear and are assigned  $\theta$ -roles in contrast to languages like English, where such expressions are expected in the so-called 'operator' position—in the case of English, WH-expressions occupy the sentence-initial position of a WH-interrogative sentence at S-structure, while they are generated in the argument positions at D-structure. The syntactic operation of movement transformation (now familiar as *Move- $\alpha$*  (Chomsky(1981 etc.)) maps the D-structure representation onto an S-structure representation—by this process, a WH-expression is moved from an argument position to an operator position and 'binds' the trace that is left behind in the argument position which the WH-expression used to occupy.

In recent work (May (1977, etc.), Chomsky( 1981 etc), etc.) it has been proposed that the conception of *Move- $\alpha$*  be generalized to other areas, such as the treatment of quantifier expressions such as *everyone*—these expressions are generated in the argument positions both at S-and D-structures, but serve as operators in the logical representation (LF). Such an operation, called QR (from 'quantifier raising') moves the quantifier expression that occupies an argument position at S-structure to an operator position at LF: this latter position is created by means of Chomsky-adjunction. The application of QR yields a trace in the position from which the quantifier-expression (QP) has moved, as do other instances of *Move- $\alpha$* , and this trace serves as a variable bound by the QP in the LF representation.

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Fig.1



The 'scope' of the QP is now identified as the c-command domain of the QP at LF.<sup>1</sup> One of the theoretical consequences of the advent of QR is that the notion of Move- $\alpha$  has been considerably generalized—in languages like English, Move- $\alpha$  serves as a mapping operation not only between D- and S-structures, but also between S-structure and LF.

In 'nonconfigurational languages' like Japanese, it has been claimed that the status of Move- $\alpha$  should be much more restricted than in configurational languages like English—in particular, it has been suggested that there would be no application of Move- $\alpha$  in such a way as to move a constituent from one argument position to another ('NP-movement'), its possible non-configurational counterpart being 'Assume GF' (Chomsky(1981)). There would be no analogue of WH-movement as an operation mapping D-structure to S-structure either, since, as I have said earlier, WH-expressions in these languages stay in the argument positions at S-structure (as well as at D-structure). If this much is true, as far as the mapping of D-structure to S-structure is concerned (it might not make sense at all to speak of 'mapping relations' in these languages), Move- $\alpha$  would find no place to be in these languages.<sup>2</sup>

Huang(1982ab) develops a theory of 'long distance dependency' (' $\bar{A}$ -binding' in the government and binding tradition) phenomena in various languages, where he proposes that WH-expressions in Chinese, which, just as in Japanese, occur in the argument positions at S-structure, get moved to an operator position in the mapping of S-structure to LF. One of the theoretical assumptions underlying his idea is (i) that WH-questions form a subclass of quantificational sentences. This, as far as I know, is a widely accepted view beyond theoretical frameworks. Cf. Karttunen(1977), where WH-expressions are identified as the existential quantifier in the semantic representation. Secondly, he assumes (ii) that all languages have a rule that moves a WH-expression to an operator position, the difference lying in where that rule may apply: in the syntax, or in LF.

Japanese, along this line of logic, would be a language that has WH-movement in the process mapping S-structure to LF. If a WH-question in

Japanese is also a kind of quantificational sentence, and if movement to an operator position is one way of specifying scope of a quantificational expression available in the type of linguistic theory that we assume here, this may not be a very controversial idea.

## 2. WH-Movement in Japanese

Given that Japanese has a WH-movement rule in LF, what would be the form of such a rule? Several possibilities come to mind—here, I simply assume that WH-movement in Japanese moves a WH-expression and Chomsky-adjoins it to S'. One important point that distinguishes Japanese WH-interrogative sentences from Chinese (as it is described by Huang (1982ab)) is that any sentence containing a WH-expression has to end in an interrogative particle *ka*, which I take to be dominated by COMP. And this is true irrespective of whether the WH-question is a matrix question or an embedded question.<sup>3</sup>

- (1) Dare ga ki-masu ka?  
 who nom come int.  
 'Who will come?'
- (2) \*Dare ga ki-masu?
- (3) Boku wa [dare ga kuru ka] sir-i-mas-en.  
 I top. who nom come int. know-not  
 'I don't know who will come.'
- (4) \*Boku wa [dare ga ku-ru no] o sir-i mas-en.  
 I top who nom come that acc. know-not.

The exs. (2) and (4) are both ungrammatical because they do not contain the interrogative COMP *ka* in the appropriate place.<sup>4</sup> The occurrence of *ka*, in fact, is necessary not only for WH-questions but also for so-called yes/no questions.

- (5) Katoo-san wa kinoo ki-masi-ta ka?  
 Mr. Kato top yesterday come-past int.  
 'Did Mr. Kato come yesterday?'

Again, this is true of embedded questions as well.

- (6) Suzuki-kun wa [Katoo-san ga kinoo ki-ta ka] sir-te iru  
 Suzuki top nom yesterday came int. know be

hazu-desu.

must

'Suzuki should know whether Mr. Kato came yesterday.'

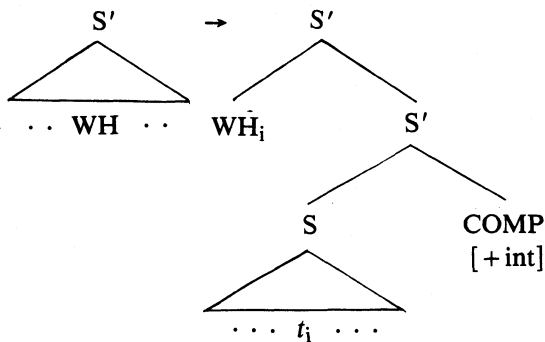
One important feature of *ka* in connection with WH-questions is that it serves as a 'scope indicator' for a given WH-expression. Thus consider the following sentences.

(7) Sinbun wa [dare ga erab-are-ta ka] tutae-te-imas-en.  
 newspaper top who nom be-elected int. inform-not  
 'Newspapers do not tell us who was elected.'

(8) Sinbun wa [dare ga erab-are-ta to] tutae-te i-masu ka?  
 newspaper top. who nom be-elected COMP inform be int.  
 'Who do the newspapers tell us was elected?'

In (7), where *ka* appears within the embedded clause, the scope of the WH expression is specified as that embedded clause. In (8), where *ka* occurs at the end of the entire sentence, the scope of the WH extends over the whole sentence, yielding a matrix question. In terms of our movement analysis, this observation can be captured if we define WH-movement in such a way that it adjoins a WH-expression to an S' whose COMP bears the feature [+int], where 'int' stands for 'interrogative'.

Fig.2



If WH-movement applies successive-cyclic, which we will see later on is a necessary assumption, we should say that WH-movement takes place until it finds an S' whose COMP is [+int]. Further, this process requires some sort of 'minimality' restriction—adjunction of a WH-expression must be to smallest S' available that contains a COMP [+int]. To see this point, consider the following example.

- (9) *Sinbun wa [dare ga erab-are-ta ka] tutae-te i-masu ka?*  
 newspaper top. who nom be-elected inform be  
 'Do the newspapers tell us who was elected?'

In this sentence, which contains two occurrences of *ka*—one in the embedded clause and the other in the matrix clause—the scope of the WH-expression that appears within the embedded clause (at S-structure) extends only over the embedded clause, the matrix clause *ka* serving as a yes/no question indicator. An interpretation like the following, which should be possible were it not for this locality requirement, is totally impossible for (9).

- (10) [WH *x*: *x* a person][do the newspapers tell us [whether *x* was elected]]

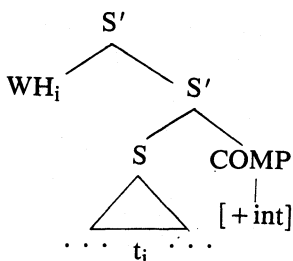
This fact indicates that WH-movement in Japanese has to apply in such a way that it adjoins a WH-phrase to the minimal S' whose COMP is [+int].

Given the formulation of WH-movement that we have suggested for Japanese, the observations made so far can be captured by the following statement.<sup>5</sup>

- (11) (At LF:) A WH must be governed by [+int] in a minimal domain containing the both.

Here, the notion 'minimal' is just as it is defined in Nishigauchi (1984): a node N, of category  $X^n$ , is minimal with respect to W iff there is no node *x* of cat.  $X^n$  such that N dominates *x* and *x* contains W. Notice that in an LF configuration created by the application of WH-movement such as the following:

Fig. 3



the WH that occupies an operator position is still governed by COMP since the lower S' does not count as a barrier for c-command (and hence government) under the usual definitions of c-command (cf. Reinhart (1976), Chomsky (1981)). The statement (11) should be generalized somewhat to cover

a certain class of quantificational sentences such as (12), where one finds a WH together with the quantificational(?) particle *mo* yielding universal quantification.

- (12) [Dare ni denwa-si-te mo] rusu dar-ta.  
 who dat call-do Q absent be-past  
 'Everybody (anybody) that I called was away.'

To deal with cases like these, it will be necessary to incorporate other elements such as Q(quantificational) as governors for WH at LF, but for the purposes of the present discussion, the statement (11) does the necessary work. Sentences (2) and (4) will be properly ruled out by (11), since they do not contain a COMP [+int]. Also, the absence of an LF representation like (10) for sentence (9) will be predicted, since only the embedded clause S' can be taken as a minimal domain, given our understanding of the notion 'minimal'.

### 3. Apparent violation of Subjacency in Chinese and Japanese

Given that Japanese has a WH-movement rule as an operation mapping S-structure to LF, we should now consider what sort of restriction should be imposed on this process. Huang (1982b), on the basis of Chinese data, argues that the constraint relevant to this process must be the Empty Category Principle (ECP); he also presents several arguments showing that Subjacency does not play any role at LF, although it does play some role in the syntax. His claim is crucially based on contrasts like the following.

- (13) [NP[S ta taolun sheme] de shu] zui youqu?  
 he discuss what book most interesting  
 'Books (in which) he discusses what are most interesting?'

- (14) \*[NP[S ta weisheme xie] de shu] zui youqu?  
 he why wrote book  
 'Books that he wrote why are most interesting?'

In (13), which is grammatical, there is a WH element within a relative clause. If this WH were to be moved out of this relative clause and placed in an operator position of the matrix clause (which he assumes is COMP), the LF representation for (13) would be something like the following.

- (15) [what]<sub>i</sub>[S[NP[S he discusses t<sub>i</sub>] books] most interesting]

This application of WH-movement violates Subjacency (the Complex NP Constraint (CNPC) effect), assuming that S and NP are bounding nodes that count for Subjacency (and this effect should hold irrespective of whether WH-movement takes place in a 'one-swoop' fashion or it applies successive-cyclic; first within the relative clause and then to the matrix COMP.) On the other hand, by the same assumption, the LF representation for (14) would be (16).

(16) [why]<sub>i</sub>[<sub>S</sub>[NP[<sub>S</sub> he wrote *t<sub>i</sub>*] books] most interesting]

This exhibits the same kind of Subjacency-violation as (15); and yet only (16) must be ruled out. In his earlier work (1982a), Huang suggests that what distinguishes these two cases is whether a given WH is an NP ('objectual') or not: an 'objectual' WH may escape the Subjacency-effect, while non-objectual WH's such as *weisheme* 'why' and *zeme* 'how', which are adverbials, may not. His later work (1982b) claims that the relevant distinction should be that between arguments and non-arguments (adjuncts) — arguments are NP's which are lexically governed, such as the object, which is assumed to be lexically governed by V, while adjuncts, typically adverbials, are not governed by any lexical element. He argues that, since exactly those NP's that are lexically governed may escape Subjacency, the principle relevant to the distinction must be based on the notion 'proper government': it must be the ECP, which is stated as in the following (Chomsky (1981)):

(17) The ECP: An empty category must be properly governed.

Here, the notion 'proper government' is understood as the following definition indicates.

(18) Proper government:

X properly governs Y iff X governs Y and

- (a) X is a lexical category; or
- (b) X is co-indexed with Y.

Given this theory, the trace in (15) is properly governed, since it is governed by a lexical element V (case (a) of (18)), so that if the ECP is the only principle relevant here the LF representation (15) is marked well-formed. The LF representation (16) is marked ill-formed on the same assumption, since the trace there is not governed by any lexical item, for that trace is an adjunct, which hangs directly from the root S.<sup>6</sup>

In Japanese, one finds exactly the same contrast as that between (13)

and (14) above.

(20) [NP[S nani o tutaete-iru] kizi] ga itiban omosiroi desu-ka?  
 what acc inform article nom most interesting be Q  
 'Articles which talk about what are most interesting?'

(21) \*[NP[S kare ga naze kai-ta] kizi] ga itiban omosiroi desu-ka?  
 he nom why write-pst article nom most interesting be Q  
 'Articles that he wrote why are most interesting?'

In light of the striking similarity of this contrast with that between (13) and (14) in Chinese above, one might be tempted to account for it using the same principle that Huang's theory invokes, viz. the ECP: the contrast here can be captured in terms of the difference between an argument WH-expression *nani* 'what' and an adjunct WH *naze* 'why'—if these sentences were to have LF representations analogous to (15) and (16), then only the argument WH can escape the Subjacency effect, and the adjunct WH cannot; hence the ungrammaticality of (21). Notice that this line of analysis crucially depends on the assumption that Japanese is a 'configurational language', one that has a VP node, so that the object NP can be governed by the V. This is in direct contradiction to the more familiar assumption that Japanese is not a configurational language and lacks a VP node and that everything within a sentence, arguments or adjuncts, hangs directly from S, so that it will be impossible to make any distinction among elements within a sentence in terms of lexical government, since nothing in such a structure is governed by any lexical item.

What I am going to discuss in what follows is, however, independent of this configurationality controversy: the point that I want to make here is that, although sentence (20) is grammatical, its LF representation does not involve violation of Subjacency. In fact, what I am going to claim is that no violation of Subjacency is possible in the process mapping S-structure to LF. If Subjacency is inviolable, as I would like to maintain, why is sentence (20) grammatical? I am going to suggest that Japanese (and other languages in which relative clauses occupy prenominal positions and serve essentially as determiners, such as Chinese and Korean) allow movement of the entire complex NP that contains a WH-expression—essentially a pied-piping effect—as well as the WH within the complex NP, which moves *within* that complex NP. Thus, the LF representation that I suggest for (20) is not (22) but is something like (23)—technical details will be discussed later.<sup>8</sup>

(22) [what]<sub>i</sub> [S[NP[S' t<sub>i</sub> talk-about] article] most interesting]



(23) [<sub>NP</sub>[<sub>S</sub>'[what]<sub>i</sub> [<sub>S</sub>' t<sub>i</sub> talk-about]] article]<sub>j</sub> [<sub>S</sub> t<sub>j</sub> most interesting]

#### 4. Semantic Arguments for Pied-Piping at LF

Semantically, sentence (20) is not a question that asks for the identity of the topic of the article(s): rather, the speaker, in uttering sentences like (20), is after the identity of the article(s) making crucial use of the value assigned to the operator expression *nani* that appears within the relative clause. Huang himself appears to have a similar intuition about sentences like (13), and observes (1982a) that "in [13] the speaker is, in effect, asking which book in terms of the identity of the [topic that somebody discusses in that book], is the most [interesting]." (p.381) He, however, does not discuss what this semantic consideration might mean for the problem of LF representations. I, on the other hand, am going to claim that the LF representation (23) is what captures this semantic intuition. This claim is based on the following three types of observations: (i) types of possible elliptical answers to WH questions, which end in a copula *da* (*desu*); (ii) the semantics of sentences that have a quantificational WH-expression within a complex NP; (iii) sentences involving multiple occurrences of WH-expressions within a complex NP.

It is worthwhile to see what kind of answer is available to a question sentence when we are interested in the nature of that question. Here, let us consider what kind of answer is appropriate to a WH-question in general. Given a question like:

(24) Q: (Anata wa) nan-nen ni umare-masi-ta ka?  
           you top what-year in born-be past Q  
           'In what year were you born?'

it is certainly possible to give a full-fledged answer like the following, where the whole sentence is repeated, together with the value for the WH-expression filled in.

(25) A: (Boku wa) 1954-nen ni umare-masi-ta.  
           I top year in born-be past  
           'I was born in 1954.'

It is also possible to give an answer to (24) using an elliptical sentence, supplying the minimal information, viz. the value for the WH-expression in the question, together with the sentence-ending particle *da* (*desu*).

(26) A: 1954-nen desu.

Omitting details, one can characterize this type of answer as filling in the value for the WH-expression that occupies the operator position in an LF representation for (24):

(27) [nan-nen]<sub>i</sub>[(anata wa) t<sub>i</sub> umare-ta ka]

As Kuno (1978) observes, this type of answer requires that everything except the focus element has to be omitted, so that an 'incomplete' elliptical answer with something else left undeleted is ungrammatical except with some marked interpretation.

- (28) Q : Suzuki-san wa Satoo-san ni nan-zi ni ai-masi-ta ka?  
 Mr. top with what time at meet past Q  
 A<sub>a</sub>: 9-zi ni ai-masi-ta.  
 A<sub>b</sub>: 9-zi ni desu.  
 A<sub>c</sub>: \*Satoo-san ni 9-zi ni desu.  
 A<sub>d</sub>: Suzuki-san wa Satoo-san ni 9-zi ni ai-masi-ta.

Answer A<sub>a</sub> and A<sub>b</sub> are acceptable since they minimally supply the value for the WH-expression in the question (28), whose LF representation I take to be:

(29) [nan-zi]<sub>i</sub> [S wa S ni t<sub>i</sub> aimasi-ta ka]

Answer A<sub>c</sub> is ungrammatical because, in our terms, something which was not in an operator position in the question, viz. *Satoo-san ni*, is left undeleted. A<sub>d</sub> is ok because it is not an elliptical sentence. These observations suggest, then, that an elliptical answer with *da* (*desu*) to a WH-question must supply only the value for the operator expression of the question.

With this much in mind, let us return to our problem sentences which allegedly involve violation of Subjacency. What kind of answer can be appropriate for questions like this?

- (30) [NP[S nani- too o sizi-si-te-iru] hito] ga itiban ooi  
 what party acc support person nom most numerous  
 desu ka?  
 be Q

'People who support which political party are the majority?'

Apart from a full-fledged answer that repeats the entire sentence, there are two possible elliptical answers which end in *da/desu*.

- (31) A<sub>a</sub>: Zimin-too desu.  
 A<sub>b</sub>: Zimin-too o sizi-si-te iru hito desu.  
 LDP acc support person be.

Now, suppose that the LF representation for (30) were to be something like (32), which Huang appears to assume in such cases.

- (32) [what-party]<sub>i</sub>[[NP[S t<sub>i</sub> support] person] most numerous be Q]

This representation predicts that (31A<sub>a</sub>) should be the only possible elliptical answer, since the operator expression in (32) is *nani-too* 'what party', so that the only possible elliptical answer to this question should be that which supplies the value for this operator and nothing else, viz. the name of a political party. The fact that (31A<sub>b</sub>) is also possible as an elliptical answer to (30), then, cannot be explained, since the portion of this answer that is followed by the copula *desu* does not match the operator of (32). If, on the other hand, the LF representation for (30) were something like:

- (33) [NP[S[ what party]<sub>i</sub>[S t<sub>i</sub> support]] person]<sub>j</sub> [S' t<sub>j</sub> most numerous be Q]

The operator expression for the entire clause, according to this LF representation, does match the answer (31A<sub>b</sub>): this line of analysis accounts for the fact that (31A<sub>b</sub>) is an appropriate answer in terms of the semantic property of the WH-questions under consideration: what question (30) is after is the identity (or property) of the people on the basis of the identity of the political party they support. Thus, the most informative (elliptical) answer to (30) must be (31A<sub>b</sub>), which supplies the identity of people making crucial use of the value for the WH-expression whose domain ranges over political parties. An elliptical answer like (31A<sub>a</sub>) on this analysis, must be considered as a truncated form of the elliptical answer A<sub>b</sub>: this type of answer is possible only when that answer is sufficient for recovering the identity of a certain entity whose description contains the value for the WH-expression. Thus, the reason why (31A<sub>a</sub>) is not unacceptable (though, for many speakers, less acceptable than (31A<sub>b</sub>),) is that it is relatively easy to reconstruct the identity of the people who support it on the basis of the identity of the political party. In cases like the following, the situation appears to be different.

- (34) [NP[S dono kyoozyu ga suisen si-te-iru] hito] ga  
 which professor nom recommend . person nom  
 saiyoo-sare soo desu ka?  
 employed-be likely be Q

'(The) person that which professor recommended is most likely to get the position?'

A<sub>a</sub>: Suzuki kyoozyu ga   suisen si-te-iru hito desu.  
                   prof.    nom recommend    person  
                   '(It's) the person Prof. Suzuki recommends.'

A<sub>b</sub>: ??Suzuki kyoozyu desu. 'It's Prof. Suzuki.'

The answer A<sub>b</sub>, supposedly a truncated version of the appropriate elliptical answer A<sub>a</sub>, does not sound very good. This contrast again follows naturally from our analysis, where the LF for the question (34) is something like (35), where the entire expression corresponding to *(the) person that which prof. recommends* occupies that operator position for the matrix clause, and no violation of Subjacency is involved, rather than (36), which does involve violation of Subjacency.

(35) [NP[S[which prof.]<sub>i</sub> [S t<sub>i</sub> recommends] person]]<sub>j</sub> [S' t<sub>j</sub> likely to be employed Q]

(36) [which prof.]<sub>i</sub> [S'[[t<sub>i</sub> recommends] person] likely to be employed Q]

The representation (36) predicts that (34A<sub>b</sub>) should be the only possible elliptical answer to (34), since the operator expression in (36) matches it, and not (34<sub>a</sub>).

It is not clear to me at the moment why the truncated answer is much less appropriate in cases like (34) than in cases like (30)-(31). Various factors, more or less pragmatic in nature, must be involved here. One point that is worth mentioning is that it appears to be easier to recover the identity of a certain description from a truncated answer when the sets denoted by the entire description and by the value of the operator inside that description are disjoint in reference; in other words, the two are related to completely different kinds of entities. In the case of (30)-(31), the description in question involves the set of people and the operator inside that description ranges over a set of political parties, and these two relevant sets are sufficiently disjoint and they never intersect in reference. And in such a case it appears to be easier to come by the identity of the whole description just given the identity of the entity that is contained therein. On the other hand, in (34), the entire description refers to a set of candidates for a certain position and the WH expression contained within it ranges over a set of professors: these two sets are close to each other in reference, if not intersecting. This, I gather, is one of the factors that make the truncated answer (34A<sub>b</sub>) relatively inappropriate.

It is possible to make a similar point if we consider WH-questions that

involve multiple occurrences of WH-expressions.

- (37) Dare ga dare ni tegami o kaki-masi-ta ka?  
 who nom who dat letter acc write past Q  
 'Who wrote a letter to who?'

It is possible to give an elliptical answer to (37), such as (38Ab), alongside a full-fledged answer (38Aa).

- (38) Aa: Nakasone-san ga Tanaka-san ni tegami o kaki-masi-ta.  
 Mr. nom dat letter acc wrote  
 'Mr. Nakasone wrote a letter to Mr. Tanaka.'  
 Ab: Nakasone-san ga Tanaka-san ni desu.  
 nom dat  
 'Mr. Nakasone did, to Mr. Tanaka.'

The answer (38Ab) minimally supplies the value for the two WH-expressions used in the question (37), whose LF representation I assume is something like (39), where the two WH operators are absorbed into one, along the idea of Higginbotham and May (1981).

- (39) [WH  $x_i, x_j$ :  $x_i, x_j$  a person][ $t_i$  wrote a letter to  $t_j$  Q]

The fact that (38Ab) is appropriate would simply follow from the characterization of elliptical answers given above.

Now, consider the following question, where one finds multiple occurrences of WH-expressions within a complex NP.

- (40) [NP[S dare ga dare ni kai-ta] tegami] ga mitukari-masi-ta ka?  
 who nom who dat wrote letter nom be-found Q  
 '(The) letter that who wrote to who was found?'

If the WH-expressions in it are capable of escaping the Subjacency effect, as Huang's theory suggests, the LF for (40) would be (41).

- (41) [WH  $x_i, x_j$ ] [[[ $t_i$  wrote to  $t_j$ ] letter] was found Q]

If this were the correct representation, we should predict that (42), which minimally supplies the value for the WH-expressions that occupy the operator position in (41), should be appropriate.

- (42) (\*) Nakasone-san ga Tanaka-san ni desu. (= (38Ab))

The fact, however, is that (42) is totally impossible as an elliptical answer to (40). A more appropriate answer is something like this.

- (43) Nakasone-san ga Tanaka-san ni kaita tegami desu.  
                     nom                    dat wrote letter be  
 '(It's) the letter that N. wrote to T.'

This situation, again, could be captured if we assumed that the LF representation for (40) is something like (44), where the entire description that contains the two WH-expressions is moved, as well as the two WH's, which move within the complex NP.

- (44) [NP[S[WH  $x_i$ ,  $x_j$ ] [S  $t_i$  wrote to  $t_j$ ] letter]<sub>k</sub>[S'  $t_k$  was found Q]

This, again, follows from our assumption that (40) is a question that asks for the identity of a letter making crucial use of the identity of the two persons, one of whom wrote it to the other.

A third case for the present line of analysis comes from WH-questions that involve quantificational expressions. Consider a sentence like this:

- (45) ??[NP[S nan-ka-koku                    kara ki-ta] syunoo] ga  
                     how many countries from came leaders nom

'Leaders that came from how many countries gathered?'

This sentence sounds, at best, very odd: the only interpretation of (45) would be that on which the question asks for the identity of leaders in terms of how many countries that they are from. It would require an extremely bizarre situation where, say, leader A comes from three countries, leader B comes from two countries, etc.<sup>9</sup> It can never have an interpretation on which the speaker is asking for the number of countries from which leaders came to attend a summit meeting, which is available from a sentence like this.

- (46) Nan-ka-koku                    kara syunoo ga atumari-masi-ta ka?  
                     how many countries from leaders gathered Q  
 'From how many countries did leaders gather?'

But if WH-expressions under consideration can escape the Subjacency effect, nothing would prevent us from expecting the unavailable interpretation analogous to the one available for (46), since under such an analysis,

nothing, *prima facie*, prevents us from assigning an LF representation like (47) to (45).

(47) [how-many-countries]<sub>i</sub> [[[from  $t_i$  came] leaders] gathered Q]

The point here is that nothing prevents us from assigning the WH-expression *how-many-countries* the wide scope interpretation, even if we treat the description headed by *leaders* as a quantifier expression that gets moved by QR, in which case we would have something like this:

(48) [How-many-countries]<sub>i</sub> [[[from  $t_i$  came] leaders]<sub>j</sub> [ $t_j$  gathered Q]]

This LF still represents an interpretation analogous to the one for (46), which is unavailable for (45). What if we allowed the description headed by *leaders* to take scope wider than *how many countries*? The result will be this:

(49) [[from  $t_i$  came] leaders]<sub>j</sub> [how-many-countries]<sub>i</sub> [ $t_j$  gathered]

This might be closer to what we want for (45), but this representation is ill-formed since the trace  $t_i$  contained in the topmost operator expression is not c-commanded by its WH-operator. Thus, along this line, it is impossible to represent the interpretation for (45) correctly.<sup>10</sup> On the other hand, given the present line of analysis, (45) would be mapped to an LF representation like:

(50) [NP [S[how many countries]<sub>i</sub> [S[from  $t_i$  came]] leaders]<sub>j</sub> [S $t_i$  gathered Q]]

This representation predicts that the WH-expression *how many countries* will never take scope over the description headed by *leaders*, since the former is contained within the latter, whatever kind of quantification may be associated with the entire description.

## 5. More on Pied-Piping at LF

Thus far, we have been trying to argue that a WH-question in Japanese that has a WH-expression within a complex NP does not involve violation of Subjacency in its mapping to LF: thus given an S-structure like:

(51) [S' . . . [NP[S . . . WH . . .] N] . . . Q]

it will be mapped to an LF like this:

(52) [NP[S[WH]<sub>i</sub>[S . . . t<sub>i</sub> . . . ] N]<sub>j</sub> [S' . . . t<sub>j</sub> . . . Q]

That is, WH-movement moves the entire description that contains a WH-expression to the operator position of the matrix clause, as well as the WH-expression, which moves within the relative clause—essentially a pied-piping effect.

Up to this point, we have just been claiming that the type of WH-movement that I have just mentioned should be possible in Japanese—we have not discussed how such a process is allowed in this and possibly other languages. The point that I am going to make here is that it must be related to the properties of relative clauses in Japanese: a relative clause in this language is essentially a specifier expression. On the other hand, WH-movement is a rule that is sensitive to the operator-like quality of a given phrase, which might be represented in terms of a feature, say, [+WH]. This feature, [+WH], can be associated with an expression of the phrasal level: such WH-words as *who*, *what*, etc., which serve as NP's by themselves constitute this class. The [+WH] status of a phrase can also be determined by a specifier expression contained within a phrase: if the specifier is [+WH], then the entire phrase can behave as a WH-expression: *which man*, *what (kind of) book*, etc. This is essentially the idea of the Condition on Analyzability, which has been stated by May (1977, p. 14):

(53) *Condition on Analyzability:*

If a rule  $\phi$  mentions SPEC, then  $\phi$  applies to the minimal [+N] phrase dominating SPEC, which is not immediately dominated by another [+N]-phrase.

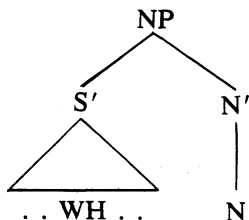
In fact, if we assume some kind of percolation mechanism which allows a relevant feature associated with the specifier, [+WH] in this case, to climb up to the entire phrase dominating that specifier, we would no longer need a stipulation that WH-movement 'mentions SPEC': if the feature of the specifier is taken over by the dominating phrase, all you have to say is that WH-movement looks for a phrase that has the feature [+WH], and the rule does not even have to 'mention SPEC'. And this type of feature percolation can be regarded as a default case of the head-feature percolation of the sort explored by Selkirk(1982): the feature of the head of the phrase is percolated, but the feature of a nonhead can be percolated just in case the head is unmarked with respect to that feature. Applied to the present case, given an NP of the form: [NP Spec N'] if Spec exhaustively dominates an expression which is [+WH] this feature is percolated to NP if the head N' dominates a common noun, such as *book*, *man*, etc., which



is unmarked with respect to referentiality. This type of percolation will be blocked if the head N' dominates, e.g. a proper noun, such as *John*, since a proper noun is marked for referentiality: it is inherently definite and referential, hence an NP like \**which John* cannot be treated as a WH-phrase, unless *John* is used as a common noun.

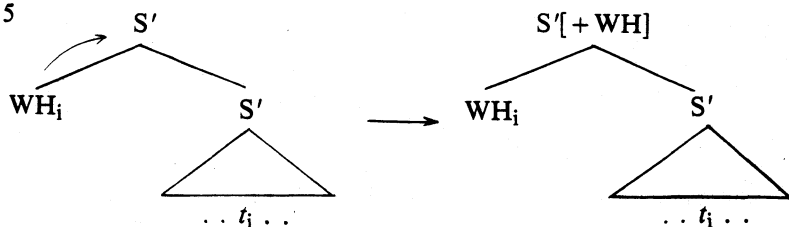
Returning to the Japanese relative clause that contains a WH-expression within it, such as this:

Fig. 4



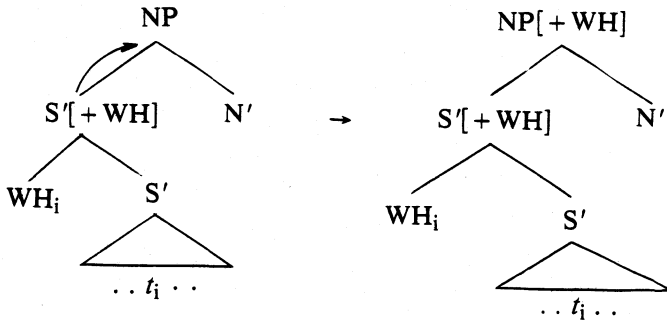
I would like to argue that S', a specifier, can be somehow marked [+WH] in the LF derivation, and that this feature [+WH], is percolated and climbs to NP. How, then, can [+WH] be assigned to S'? Here I would simply stipulate that a feature associated with an  $\bar{A}$ -position, as well as Spec, can be percolated if the head is unmarked with respect to that feature. Hopefully, there may be a general way of collapsing the two cases: Spec of NP might be an  $\bar{A}$ -position, in which case no mention of Spec will be necessary.<sup>11</sup> Thus, when WH-movement takes place within a relative clause, S' can become [+WH] since a [+WH]-expression now occupies the  $\bar{A}$ -position as the result of the application of WH-movement, and a feature of an  $\bar{A}$ -position can climb up. Thus, after the application of WH-movement, the following percolation takes place.

Fig. 5



Once this takes place, the [+WH] feature automatically climbs up to the entire complex NP, since S' in the relative clause in Japanese is, on our assumption, a Spec (and it is quite likely that it can be characterized as an A-position as well). Thus, the [+WH]-feature, now associated with S, is percolated:

Fig. 6



Since the entire complex NP, due to this process, is identified as [+WH], it can now move to an operator position for the matrix clause. This explains why pied-piping at LF is possible in a language like Japanese. I would like to maintain that this line of analysis applies to many other languages, such as Chinese and Korean, where relative clauses occupy a prenominal position and are essentially identified as Spec: in both of the just-mentioned languages, apparent violation of Subjacency in WH-questions is attested (cf. H.S. Lee (1981) for Korean data).

This line of analysis further explains why pied-piping is strictly limited in English WH-question constructions.

- (54) a. Who did you draw a picture of?  
 b. \*A picture of who(m) did you draw?

The ungrammaticality of (54b) follows straightforwardly: a postnominal modifier of an NP in English is certainly not a Spec, nor can it be an  $\bar{A}$ -position (it is governed and is  $\theta$ -marked): thus given an NP of the form: [<sub>NP</sub> a [<sub>N'</sub> picture [<sub>PP</sub> of who]]] the [+WH] feature of *who* that appears in the postnominal complement will never be percolated; the referential property of the entire NP is independently dictated by an element in Spec—in this case, the indefinite article *a*. Therefore, the entire NP *a picture of who* will not be identified as [+WH], and cannot be moved: hence the ungrammaticality of (54b).<sup>12</sup>

One piece of evidence for the present line of analysis comes from the following contrast in Chinese, provided by Huang (1982a, pp. 404-5; also in 1982b):<sup>13</sup>

- (55) [[shei mai-de] shu] zui hao? atumari-masi-ta ka?  
 who buy book most good gather past Q  
 'Books that who bought are most interesting?'

- (56) \*[[shei mai-de] neiben shu] zui hao?  
 who bought that book most good  
 'That book that who bought is best?'

The only difference between these two cases is that the head of the complex NP in (56) is preceded by a demonstrative pronominal, while that in (55) is not. Since Huang assumes that Subjacency may be violated in an LF representation involving 'objectual' operators, he has to present an explanation for the above contrast independent of subjacency. Certainly, his (1982b) ECP account will never work, since in either of the two cases does the WH-expression occur in an argument position, which, according to him, is lexically governed. So, *prima facie*, nothing in his theory accounts for the above contrast. Huang, therefore, invokes a constraint that has been proposed elsewhere: the Specificity Condition, due to Fiengo and Higginbotham (1981):

- (57) A specific NP may not contain a free variable.

(This statement is due to Huang. Equivalently: a variable within a specific NP (or referential NP) must be bound within that NP.) Huang argues that the complex NP in (56) is specific because of the demonstrative attached to the head. Thus, if WH-movement applies in such a way as to move *shei* to an operator position outside the complex NP, this specific complex NP will end up containing a variable which is not bound within it, which is in violation of the Specificity Condition (57). Also, Huang observes that if the head of a complex NP is a proper noun, the complex NP cannot contain a WH-expression.

- (58) [[ai kan sheme de] xiaohai] mei chuxi?  
 love see what child no future  
 'Children who love to see what have no future?'
- (59) \*[[ai kan sheme de] Xiaoming] mei chuxi?  
 love see what no future  
 'Xiaoming, who loves to watch what, has no future?'

A complex NP whose head is a proper noun, as in (59), is interpreted as specific. Therefore, if a WH-element is moved out of that NP, it would end up having a free variable, in violation of the Specificity Condition. Also, Huang notes that the tense and factivity contribute to the specificity of an NP or a proposition, citing the work of Talmy Givon.

- (60) [Lisi tao shei] zui heshi?  
 marry who most appropriate  
 ‘That Lisi should marry who would be most appropriate?’
- (61) \*[Lisi tao-le shei] zhen kexi?  
 married who real pity  
 ‘That Lisi married who was a real pity?’

The sentential subject in (60) involves the future tense and is, according to Huang, interpreted as non-specific, but that in (30b) involves the past tense (and also is ‘factive’) and thus is interpreted as specific. So, (60), which would contain a free variable within a specific sentential subject at LF if the WH is moved out of that subject, would again be ruled out by the Specificity Condition.

The same situation appears to hold in Japanese. The contrast as seen in the following is similar to that between (55) and (56).

- (62) [[dare ga kai-ta] hon] ga omosiroi desu ka?  
 who nom wrote book nom interesting be Q  
 ‘Books that who wrote are interesting?’
- (63) \*[[dare ga kai-ta] sono hon] ga omosiroi desu ka?  
 who nom wrote that book nom interesting be Q  
 ‘That book, that who wrote was interesting?’

Similarly, if the head of a complex NP is a proper noun, a WH element cannot appear within that relative clause.

- (64) [[nani o taberu] ko-inu] ga zyoobu-ni nari-masu ka?  
 what acc eat puppies nom strong become Q  
 ‘Puppies that eat what will grow strong?’
- (65) \*[[nani o taberu] Fido] ga zyoobu ni nari-masu ka?  
 what acc eat nom strong become Q  
 ‘Fido, who eats what, will grow strong?’

Furthermore, the distinction w.r.t. tense and factivity gives rise to the following contrast.

- (66) [[donna dansei to - kekkon-suru] {<sup>no</sup><sub>koto</sub>}] ga risoo- desu ka?  
 What-like man with marry do comp nom ideal be Q  
 ‘That (you) marry what kind of man will be ideal?’

- (67) \*[[*donna dansei to kekkon-si-ta*] *koto*] *ga* *sippai desi-ta ka?*  
 what-like man with marry do-past that nom failure be pst Q  
 'That you married what kind of man was a failure?'

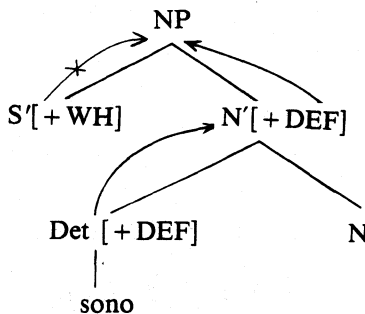
In (66), where the present tense is used, which can be interpreted as having the future time-reference, either of the two complementizers (or nominalizers) *no* or *koto*, may be used. And in this context, a WH-phrase may appear within the sentential subject. In contrast, in (67), where the past tense is used, and is interpreted factively, only *koto* can be used as complementizer or nominalizer, and in this latter case, a WH element may not appear within this 'specific sentential subject'.

Now I am going to show that the contrasts that we have observed so far follow from the present analysis for free, and that it is not necessary to rely on a separate constraint such as the Specificity Condition (although this is not to refute the validity of the latter).<sup>14</sup>

I agree with Huang in assuming that specificity or referentiality is crucially relevant to the cases under consideration—the point is that the contrasts simply follow from the restriction on the pied-piping operation that I have argued to be at work in those cases which involve apparent violation of Subjacency. If the head nominal of a complex NP is preceded by a demonstrative as in (63), the entire complex NP is interpreted as referential. If the entire complex NP is referential, it cannot be moved by WH-movement, since it is not [+WH]. The same remark applies to the ungrammaticality of (65), in which the head nominal of the complex NP is a proper noun—if the head is a proper noun, again, the entire NP is interpreted as referential, which makes the pied-piping of the entire NP inapplicable. Basically the same remark would apply to (67), which involves factivity, although the problem of how to represent the idea might be non-trivial.

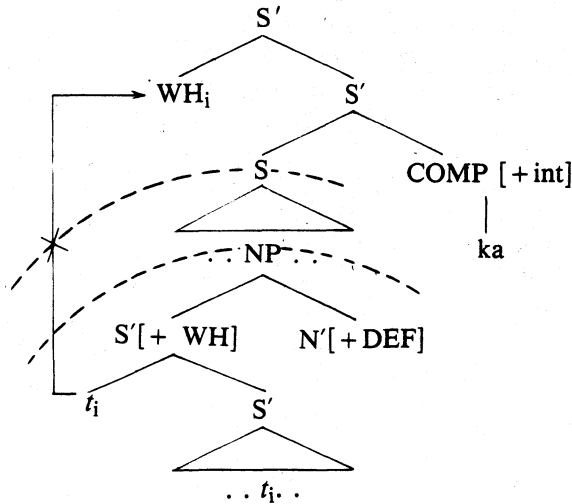
The point under consideration can be captured straightforwardly in terms of the condition on the mechanism that percolates the [+WH]-feature. Recall that the [+WH]-feature of Spec can be percolated to the dominating

Fig. 7



NP only when the head of NP is unmarked with respect to referentiality—essentially a default condition. If the head of NP, viz. N', as in the following is marked, say, [+DEF(inite)], then it will be this latter feature, rather than [+WH] of Spec, that gets percolated, since if both the head and a non-head are both marked somehow for referentiality, it must be the feature associated with the head that wins out. (The percolation of [+DEF] to N'' is due to the default condition, for the head of N', viz. N, is unmarked for referentiality, if it dominates a common noun.) Thus, the complex NP whose head contains a demonstrative will never be identified as [+WH], and so it cannot be moved to an operator position of the matrix clause. The same explanation holds for the complex NP in (65), whose head dominates a proper noun. Then, in such a constructure, the only way a [+WH] element can be moved to an operator position in such a way as to be in keeping with the condition on LF (11) above, viz. that [+WH] must be governed by [+int] in a minimal domain is that the [+WH]-expression alone moves to an operator position that is governed by [+int], and not the dominating complex NP:

Fig. 8



But this movement just violates Subjacency, and, on our assumption, has to be simply ruled out. On the other hand, what happens if the [+WH] in such a structure just stays within the relative clause at LF? This would not violate Subjacency, but is ruled out by the condition on LF (11), for in such an LF representation, [+WH] will not be governed by [+int]. Thus,

along the present line of analysis, any structure that contains a [+WH] within a complex NP whose head is somehow referential will never be mapped to a well-formed LF representation. Notice that this conclusion has been obtained for free, and we never have to invoke a separate constraint to account for the relevant data, such as the Specificity Condition. Hopefully, this latter constraint might be what follows from a consideration along the line of the present analysis, which I would like to discuss in future research. Cf. fn. 14.

Up to this point, our attention has been focused on the grammaticality of the examples from Chinese and Japanese which involve apparent violation of Subjacency, such as (13) and (20), and we have not yet presented our own analysis of the ungrammaticality of examples such as (14) and (21), which we repeat here.

(14) \* $[_{NP}[_{S}$  ta weisheme xie] de shu] zui youqu?  
           he why       wrote book most interesting  
           ‘Books that he wrote why are most interesting?’

(20) \* $[_{NP}[_{S}$  kare ga naze kai-ta] hon] ga itiban omosiroi desu-ka?  
           he nom why wrote book nom most interesting be Q  
           ‘Books that he wrote why are most interesting?’

Huang’s explanation for the ungrammaticality of (14) is, as we have seen above, that, on the assumption that the WH-expression alone moves to the operator position of the matrix clause, so that the LF representation for (14) is (16):

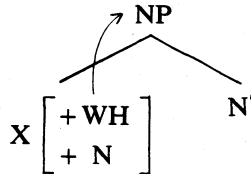
(16) [why]<sub>i</sub> [<sub>S</sub> [<sub>NP</sub> [<sub>S</sub> he wrote *t*<sub>i</sub>] books] most interesting]

the trace *t*<sub>i</sub>, being an adjunct, cannot be governed by any lexical item, nor is it bound locally by any co-indexed element within the relative clause (see fn. 6)—thus it is not properly governed, and the LF representation (16) is ruled out by the ECP, which requires that empty categories be properly governed.

Our explanation for the ungrammaticality of (14) and (20), in a sense, goes back to Huang’s earlier position (1982a)—that is, I contend that what is relevant here is the distinction in terms of syntactic categories, rather than that between arguments and adjuncts. Our analysis, however, does not make recourse to the stipulation in terms of ‘objectuality’: our assumption is that no WH-expression, NP or otherwise, may escape the Subjacency effect. The point here, rather, is that the phenomenon under consideration should

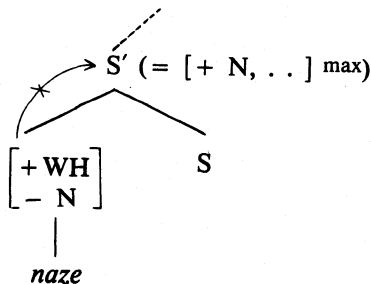
be explained in terms of a restriction on the percolation mechanism that allows the [+WH]-feature to climb up to the complex NP dominating an S' in which a WH occurs. The restriction that I suggest here is that a WH-expression must be identical in syntactic category with the dominating node in order for the [+WH]-feature to be percolated to the latter. More specifically, the WH must be at least [+N] in the sense of the X' feature system in order for the [+WH] to climb up to the complex NP.

Fig. 9



If the position designated by X in the above tree is occupied by S', the percolation of [+WH], which has been percolated to S' by a previous application of feature-percolation (to which we will turn shortly), to the dominating NP will be perhaps automatic, given that S' is [+N] in the X'-feature system, as has been claimed by Stowell (1981)—he further argues that S' is [-V], so that the distinction between NP and S' can be drawn only with respect to [ $\pm$  Tense]. The problem, then, is with the application of feature-percolation that takes place prior to the percolation of [+WH] to the complex NP: that is, the percolation of [+WH] to S' from an item in the operator-position—if the operator is [-N], the percolation of [+WH] to S' is not licenced, since, on our assumption, S' is [+N]. If such adverbial WH-expressions as *naze* 'why' are [-N], the feature-percolation from the operator position to S' will be blocked. Since [+WH] cannot climb up to S', it cannot reach the dominating NP either, and thus the pied-piping of the complex NP is not licenced.

Fig. 10





That the identity in syntactic category is relevant to the problem under consideration is suggested by examples like the following, due to Huang (1982b, p. 527).

- (68) [<sub>NP</sub>[<sub>S</sub> ta wei-le sheme yuaniyn xie] de shu] zui yougu?  
 he for what reason write book most interesting  
 'Books that he wrote for what reason are most interesting?'

Sentence (68) is grammatical, while it contains an expression meaning *for what reason*, which is semantically equivalent with *why*. The difference, then, is that the WH-expression in (68), viz. *sheme yuaniyn* 'what reason' is an NP, unlike *weisheme* 'why' in (14), which is adverbial. The same contrast, again, shows up in Japanese: the following sentence, which contains an expression corresponding to *for what reason*, is somewhat better than (20).

- (69) [<sub>NP</sub>[<sub>S</sub> kare ga [<sub>NP</sub>doo-iu riyuu] de kai-ta] hon] ga omosiroi-desu ka?  
 he nom what reason for wrote book nom interesting-be Q  
 'Books that he wrote for what reason are interesting?'

Recall that Huang's later position (1982b) argues that what is relevant is the distinction between arguments and adjuncts, rather than that between NPs and non-NPs. It should be noted, further, that the entire expression corresponding to *for what reason* is on a par with an expression corresponding to *why* not only with respect to their semantics but also with respect to their syntax—the expression meaning *for what reason* is an adjunct and cannot be considered an argument. The expression corresponding to *what reason*, however, is governed by a pre- (post-) position, and Huang (1982b) claims that it is an argument. The logic here appears to be that an 'argument within an adjunct' is an argument on a par with such items as subject, object, etc. A state of affairs like this is in direct conflict with his own idea based on the Extraction Domain, which requires that any application of movement must be out of a domain that is properly governed. Huang, thus, has to stipulate that this latter condition applies only in the syntax, and not at LF. Whether this line of reasoning is valid in the long run has yet to be examined carefully.

There are at least two sets of facts which suggest that pied-pipability of the complex NP that contains a WH-expression, rather than the ECP, is relevant to an explanation for the ungrammaticality of (14) and (20).

Firstly, let us consider what would happen if another WH-expression, of category NP, appears within a complex NP, in addition to a WH that is non-NP? An ECP account along Huang's line would predict that this

would make no difference at all, since the addition of another WH-phrase, whatever its category, does not affect the status of the relevant empty categories at LF. The following illustrates an LF representation that Huang's theory would assume for cases in question.

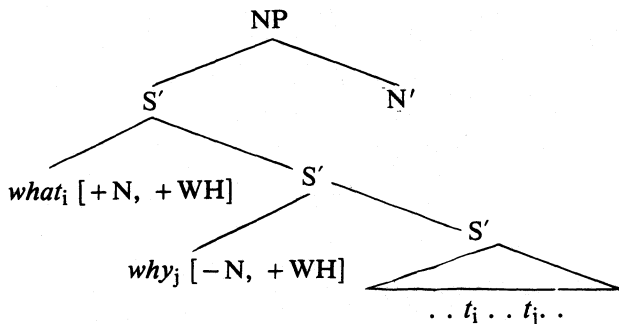
(70) [why]<sub>j</sub> [what]<sub>i</sub> [S [NP[S . . . t<sub>i</sub> . . . t<sub>j</sub> . . . ] N] . . . ]

Such an LF should be ruled out, since it contains a trace (= t<sub>j</sub>) that is not lexically governed (being an adjunct) nor is locally controlled, and hence it should be ruled out by the ECP, on a par with an LF representation for (14), viz. (16). The following example, however, shows that this prediction of an ECP account is not correct.

(71) *?(?)*[NP[S dare ga naze kai-ta] hon] ga omosiroi desu ka?  
 who nom why wrote book nom interesting be Q  
 'Books that who wrote why are interesting?'

Example (71), which contains another occurrence of WH, which is an NP, viz. *dare* 'who', within the relative clause, is somewhat better than sentences like (14), if not impeccable. Notice, on the other hand, the this difference in grammaticality is what is expected—or, at least, one of the possibilities that are expected—by the present theory. On the assumption that pied-piping at LF is involved in the cases under consideration and that this process requires the identity in syntactic category between a WH-expression and the complex NP that contains it for the [+WH] feature associated with the former to be percolated to the latter, the addition of another WH-expression whose category is NP might help the feature to climb up; for, as one of the possible derivations at LF, we could obtain an intermediate structure like the following, as a result of the applications of WH-movement within the complex NP in (71):

Fig. 11



Given this, the [+WH]-feature associated with *what* could be percolated to the topmost S' created by Chomsky-adjunction, since the categorial requirement is satisfied by the WH-expression now occupying the highest operator position, viz. *what*, since it is [+N]. If this feature-percolation is allowed, then the [+WH]-feature will automatically climb up to NP as well, for reasons already discussed. Thus the pied-piping of the whole NP will be licensed. This will, in effect, lead us to predict that sentences like (71) will be well-formed, since they will be in keeping with the well-formedness condition on LF (11), in one of their possible derivations at LF.

- (11) At LF: A WH must be governed by [+int] in a minimal domain containing the both.

The reason why sentence (71) is not completely grammatical will be attributed to the fact that a WH-expression corresponding to *why* generally resists cooccurrence with other WH-expressions within a sentence. Thus, sentences like (72) are low in acceptability.<sup>15</sup>

- (72) ??Dare ga naze ki-masi-ta ka?  
 who nom why come past Q  
 'who came why?'

Although ex. (71) is not very good, a sentence like (73), which contains more occurrences of WH-expression in addition to *why* within a complex NP, sounds somewhat better.

- (73) (?) [NP[S dare to dare ga dare ni doko-de naze kai-ta]  
 who and who nom who to where-at why write  
 tegami] ga mitukari-masi-ta ka?  
 letter nom found be past Q  
 'Letters that who and who wrote to whom at where why were discovered?'

The reason for this difference, if correct, is not immediately clear, and I concede that processing and other factors may be involved here; nevertheless, I maintain that it is a reasonable possibility that the addition of more [+N] WH-expressions might further help facilitate the percolation of [+WH]. Notice, on the other hand, an ECP account will have nothing to say about these cases, for the addition of [+N] WH-expressions in no way affects the status of the relevant empty categories.

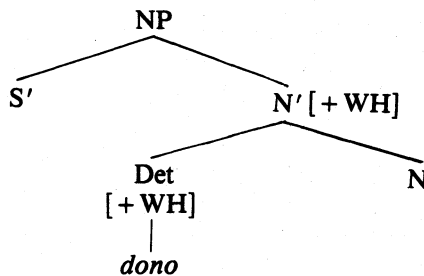
Another set of facts suggesting the relevance of pied-piping at LF to the

problem under consideration are concerned with the status of sentences like the following.

- (74) (?) [NP[S kare ga naze kai-ta] dono hon] ga omosiroi-desu  
           he      nom why write-past which book nom interesting-be  
           ka?  
           Q  
           ‘Which books, which he wrote why, are interesting?’

Although, again, (74) is not perfectly grammatical, it is considerably better than sentences like (14). The difference here is that the head nominal of the complex NP in (74) is associated with a WH determiner *dono* (which): since the head (N') of the complex NP is identified as [+WH] because of this determiner, the entire complex NP can in turn be identified as [+WH], so that the pied-piping of the entire NP will be licensed, independently of the kind of WH-expression(s) that occur within the relative clause.

Fig. 12



If the entire NP is moved to the operator position of the matrix clause, the well-formedness condition on LF (11) will be satisfied with respect to this NP, which would lead us to expect that sentences like (74) are grammatical. A question might be raised concerning the status of the WH-expression that appears within the relative clause, since, if it is the [+WH]-feature associated with the head N' that gets percolated and eventually governed by [+int], the [+WH]-feature associated with the WH that appears within S' will not be percolated, so that it will not be governed by [+int] at LF, which is in violation of (11). This might be part of the reason why sentence (74) is not perfectly grammatical. Alternatively, on the assumption that (74) must be ruled in, one might generalize the well-formedness condition (11) somewhat, so that [+WH], as well as [+int], is included as an eligible governor for [+WH] at LF:

- (75) At LF: A WH must be governed by either [+int] or [+WH] in a

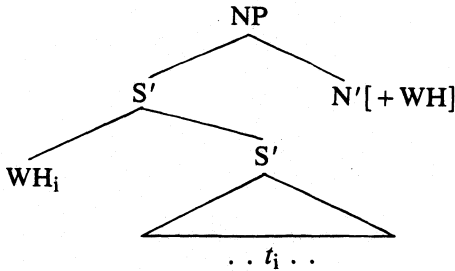
minimal domain containing the both.

Pursuing this line, we need to add a provision concerning the notion government, more or less along the line of Chomsky (1981) and Kayne (1981):<sup>16</sup>

- (76) If a domain D is governed by X, the  $\bar{A}$  (or operator)-position of D is governed by X.

Now, let us consider the following LF representation:

Fig. 13



In a configuration like the above, if the WH in S' is an NP, the [+WH]-feature is automatically taken over by the higher S' by percolation, so that the feature associated with S' will be governed, since S' is governed, by [+WH] associated with N'. So if the relevant WH-phrase is an NP, the government requirement (75) is satisfied, independent of the provision (76). This accounts for the fact that sentences like (77) are perfectly grammatical.

- (77) [NP[S dare ga - kai-ta] dono hon] ga omosiroi-desu ka?  
 who nom wrote which book nom interesting-be Q  
 'Which books such that who wrote them are interesting?'

If, on the other hand, the relevant WH-expression is not an NP, as in the case we have *why* in the relative clause, the feature-percolation will not be permitted for the reasons already discussed. If the provision (76) applies here, however, the WH will still be governed by [+WH] associated with the head N', since it appears in an operator position of S', which is governed. Thus, along this line of analysis, sentences like (74) are expected to be grammatical. Examples like the following, which contains an occurrence of a WH-expression which is an NP, in addition to another non-NP WH expression *why*, are almost perfectly grammatical.

- (78) [NP[S dare ga naze kai-ta] dono hon] ga omosiroi-desu  
 who nom why write-pst which book nom interesting-be

ka?

Q

‘Which books such that who wrote them why are interesting?’

An explanation for this will have to do with the factor that we discussed concerning the status of sentences (71) and (73), as well as that concerning the status of (74).

Again, there is a sharp contrast between the present analysis and an ECP account along Huang’s line: an ECP account predicts that sentences (74) and (78) should be no more grammatical than (14), since all of these examples are mapped to an LF representation that involves an empty category that is not properly governed: the presence of a WH expression associated with the head nominal of the complex NP does not affect the status of the empty categories in the relative clause at all, although it does affect the pied-pipability of the entire complex NP.

## 6. Concluding Remarks

The present paper has been an attempt to establish that Subjacency is a viable constraint on the derivation of LF-representations in languages where WH-expressions appear in argument-, rather than operator-positions at S-structure. In the course of the discussion, we suggested that Japanese and other languages which have relative clauses in prenominal positions allow movement of the entire complex NP that contains a WH-expression—essentially a pied-piping effect—as well as the WH itself, which moves *within* the relative clause. This means that those WH-questions in Japanese which appear to involve violation of Subjacency in LF in fact undergo multiple applications of WH-movement, none of which is in violation of the constraint.

We have presented a number of cases which an alternative account based on the ECP, which has been developed by Huang (1982a,b), fails to capture, and have shown that such cases naturally fall out of a Subjacency analysis together with the pied-piping mechanism.

Recall that an ECP account requires a lot of independent justification for the relevance of such configurational notions as proper government in languages like Japanese, which have been traditionally regarded as ‘non-configurational’ languages. Furthermore, this line of analysis would presumably be committed to the claim that the ECP is a universal condition that holds regardless of language types while Subjacency might be a parametric condition. In contrast, the present theory holds that Subjacency must be a universal condition while it is totally non-committal with respect to the status of the ECP in the universal perspective.

## Footnotes

1. Cf. May (1983) for recent elaboration of this idea.
2. Cf. Hale (1980) for more on this.
3. As an alternative analysis, one might propose a formulation of WH-movement in such a way that it involves adjunction of a WH-expression to COMP that contains an interrogative particle: in this case, WH-movement in this language would be a case of right-ward movement. Notice that, since we take *c*-command as a relevant notion for binding and scope relations, the linear order of the operator and the variable it binds is of no importance here. Therefore, the analysis to be presented here will be easily reinterpretable as adjunction to COMP, given some minor elaboration.
4. Sentence (2) is acceptable with marked intonation. Also, in women's speech, *no* may be used instead of *ka* as a question-marker, but this is possible in the matrix clause only.
  - (i) Dare ga kuru no?  
     who nom come Q  
     'Who will come?'
  - (ii) \*Watasi wa [dare ga kuru *no*] sir-a-nai wa.  
       I top who nom come know not  
       'I don't know [who will come]'
5. Cf. Harada (1972), to which the analysis presented here is largely indebted.
6. One might suspect that, if *weisheme* 'why' were to be moved within the relative clause in (14) so that there is a trace yielded in the COMP of the embedded clause, this intermediate trace ( $t'$  in (i)) will be able to govern the adjunct trace  $t_i$  and is conindexed with it (locally controls it).
  - (i) [ $\text{why}$ ]<sub>i</sub>[S[NP[S'  $t'_i$  [S he wrote  $t_i$ ]]] books] most interesting]
 Then, if Subjacency is irrelevant, the LF representation (i) predicts that sentence (14) should be grammatical because it involves no violation of the ECP.
 

Huang, in fact, assumes that there is another empty category that occupies the COMP of the relative clause, and this empty category binds another gap in the relative clause, viz. the object of *write*, so that, to be more precise, the LF representation for (14) should look like (ii).

  - (ii) [ $\text{Why}$ ]<sub>i</sub>[S[NP[S'  $t'_i$   $e_j$  [S he [ $\text{VP}$  wrote  $e_j$ ]  $t_i$ ]]] books] most interesting]
 Since the COMP of S' is branching,  $t'_i$  fails to *c*-command (and govern)  $t_i$ , and the ECP is violated. Thus, Huang's analysis rules out sentence (14) irrespective of whether there is an intermediate trace within the relative clause or not.
7. We are assuming here that S in Japanese is a projection of INFL, which

would not be a lexical category. If S is a projection of V or some other lexical category, the situation would be different, regardless of the presence of what corresponds to VP in English.

8. The kind of LF representation illustrated by (23) is referred to as a 'linked logical form' in May (1977): a linked logical form involves multiple occurrences of quantificational expressions, only one of which binds a variable in the main clause.

9. Thus, in contrast to (45), sentences like (i) are totally acceptable.

- (i) [NP[S nan-nin no kyoozyu ga sanko-suru] iin-kai] ga  
           how many professors nom participate committee nom  
 yotei-sare-te i-masu-ka?  
 scheduled be Q

'A committee meeting that how many professors attend is scheduled?'

This is because (i) a question that asks for the identity or property of a committee meeting in terms of the number of professors who attend it.

10. This is analogous to May's (1977) account of the semantics of sentences like (i), which has only the 'inversely linked' interpretation.

- (i) Everybody in some Italian city met John.

This sentence has only one interpretation, on which *some Italian city* has scope wider than *everybody*, despite the linear order of the two quantified expressions at S-structure. According to May, this point can be explained in terms of the LF-representation (ii).

- (ii) [some Italian city]<sub>i</sub> [[everybody in  $t_i$ ]<sub>j</sub> [ $t_j$  met John]]

The LF-representation (iii), which exhibits the scope relation which is the opposite to that of (ii), is ill-formed.

- (iii) [everybody in  $t_i$ ]<sub>j</sub> [[some Italian city]<sub>i</sub> [ $t_j$  met John]]

This is because the trace  $t_i$  in the topmost quantified expression is not c-commanded by its operator. The ill-formedness of (iii), thus, accounts for the absence of a 'naturally linked' interpretation for (i).

11. Williams (1982) suggests that Spec of an NP is a non-thematic position, its relation to the rest of NP, viz. N' being totally arbitrary.

12. This leaves unaccounted for the fact that PP immediately dominating a WH-phrase may pied-pipe:

- (i) Of whom did you draw a picture?

Cf. Bresnan (1976). Also left untouched here is the fact that the restriction on pied-piping is much looser with relative clause constructions:

- (ii) This man, a picture of whom you just saw, ...

This must be due to the fact that the WH-phrase involved in a relative clause construction is not just a quantificational operator, as in WH-questions, but is somehow 'referential' in the sense that it serves as a marker for the relation of predication to the head (cf. Williams (1980)). Chomsky (1982,



fn. 11) points out another case of asymmetry between WH-questions and relative clause constructions in terms of the 'weak crossover' effect.

13. Huang (1982b) must maintain that the subject NP in Chinese is lexically governed as is the object, since this language does not exhibit the subject/object asymmetry relevant to the standard definition of the ECP, of the sort observed in some European languages (cf. Kayne (1981)). Huang (1982b, p.480), thus, suggests that INFL in Chinese, which governs subject, is more lexical than that in languages like English and hence qualifies as a lexical governor. However, if my understanding is correct, this will mean that adjuncts in Chinese should also be lexically governed, since they are Chomsky-adjoined to S, whose head is INFL.

14. The Specificity Condition (SC), due to Fiengo & Higginbotham (1981), is intended to capture the contrast between (i) and (ii).

(i) I saw pictures of everybody.

(ii) I saw the pictures of everybody.

Sentence (i) allows an interpretation on which *everybody* takes the entire sentence in its scope: for everybody  $x$  I saw a picture of  $x$  (the external reading). On this reading, each picture shows one of the people individually. Sentence (ii) has only the interpretation on which each of the pictures shows everybody as a group (group interpretation). Fiengo and Higginbotham argue that (iii) may be an LF representation for (i), which represents the external reading, while (iv), which putatively stands for the same reading, is ill-formed.

(iii) [everybody]<sub>i</sub> [I saw [NP\* pictures of  $t_i$ ]]

(iv) [everybody]<sub>i</sub> [I saw [NP\* the pictures of  $t_i$ ]]

(iii), on their account, is well-formed, because NP\*, which contains a variable, is non-specific, while (iv) is out because NP\*, which contains a variable which is not bound within it, is definite, and hence specific. This is the effect of the SC.

I would like to suggest here that the effect of SC would simply follow from Subjacency if we assume that (i) QR may adjoin QP to any maximal projection; and that (ii) 'non-specific' NPs are quantifier expressions which are themselves subject to movement by QR. The first of these assumptions has been widely accepted in the current literature (cf. May (1983b)).

Given this line of approach, the LF representation for (i) would not be (iii), but something like (v).

(v) [NP[everybody]<sub>i</sub>][NP pictures of  $t_i$ ]<sub>j</sub>]<sub>S</sub> I saw  $t_j$

That is to say, *everybody* can move only in such a way that it is adjoined to the NP which immediately dominates it, and it cannot move directly to the position adjoined to S as in (iii), since this would violate Subjacency (it would cross NP and S). The 'non-specific' NP *pictures of ..* can move to the operator position of S, because, it is a quantifier expression, on our

assumption. Thus, along this line, the reason why *everybody* can take the external scope is that it can be moved *along with* the bigger QP that contains it. On the other hand, the only LF representation available for (ii) is (vi).

(vi) I saw [<sub>NP</sub>[*everybody*]<sub>j</sub>]<sub>[NP</sub> the pictures of *t<sub>i</sub>*]

This is because the bigger NP that contains *everybody* is a definite NP and hence cannot be considered as a QP subject to QR. Therefore, this bigger NP must remain in its argument position at LF. If, on the other hand, *everybody* were to move to the operator position of S, as in (iv) above, it is in violation of Subjacency.

Thus, the alternative analysis just outlined captures the contrast between (i) and (ii) equally well in a natural way without recourse to the stipulation concerning 'specificity'. It is fairly likely that the SC can be shown to be superfluous.

15. It is interesting to note that, although the status of (72) may be dubious, if the word-order is switched in such a way that *naze* is placed in the sentence-initial position, the result turns out to be completely hopeless.

(i) \**Naze dare ga ki-masi-ta ka?*

why who come past

I owe this observation to Yukinori Takubo. Cf. Takubo (to appear).

16. Originally, this was intended as a provision that allows COMP of S' to be governed by a V that governs S', in connection with the *that-trace* phenomenon.

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Shoin College  
Kobe 657  
Japan

